BUREAU OF RECLAMATION

Attachment C

Scoping Comments

2021 Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and State Water Project

From: Nancy Blastos
To: BDO Comments, BOR MPR
Subject: [EXTERNAL] Climate change
Date: Thursday, March 17, 2022 3:13:38 PM

We are in more than a drought or climate change. We are facing an existential crisis about our national water supply in Ca. None of the agencies that manage water have planned for

this crisis nor have workable plans been enforced.

We have freely given our water supply in the Central Valley to farmers, many of whom directly ship their products out of our country. We have not made it a priority to protect our citizens

or wildlife. We have made no plans to preserve the salmon species for our tribal brothers and sisters who in the Delta. These precious people subsist on salmon and other fish for five meals/

week.

As our water supply dwindles, we come up with expensive and unworkable plans. People seem to have stopped conserving water. The Sierra snow pack is just 60% compared to last year. We continue

to stretch our water supplies that are stored and will one day be empty. As I read about desalinization plants, I worry about the filth that will be generated.

We can repurpose more water, we can fix water leaks in all areas, check leaking sprinklers, use solar to heat our water, etc., etc., etc.,. We all know when we are wasting water and it must stop.

From: Greg Camphire
To: BDO Comments, BOR MPR
Subject: [EXTERNAL] Long-Term Operation of the Central Valley Project and State Water Project
Date: Tuesday, March 8, 2022 1:59:59 PM

Hello,

California's water rights system and the BOR's contracts are based on 19th Century water rights, putting large landowners above cities and the environment. Our cities' water supplies are highly insecure, and our drinking water is highly polluted with elevated levels of chemicals, pesticides, toxic algae, and salt water intrusion. We are long overdue for a significant reform of water laws and contracts. We must prioritize drinking water over agricultural exports.

It is imperative to protect indigenous tribal rights and food security. The Bay-Delta, San Francisco Bay, and rivers like the Trinity and Sacramento are important for tribal cultures and foodways. These uses need to be protected, especially considering that tribal communities are leading the response to the climate crisis with ecologically-sound conservation methods based on traditional indigenous knowledge. Therefore, these uses benefit everyone. The carry-over storage and instream flows of our reservoirs need to be protected, especially in the face of an ongoing drought and climate change that is directly threatening the water supplies of millions of Californians.

Flow protections for fish are a critical need, as salmon are currently facing extinction due to current water operations. Nearly all of the winter run salmon, and much of the spring and autumn run as well as delta smelt in the Sacramento River, have been killed during this ongoing drought period. Low flows in the Trinity River are also harming fish. These fish represent a significant food source for indigenous and other peoples, and they also represent a measurement of the health of larger ecosystems. Safe passage for fish and the reintroduction of salmon above dams is the only way to stop their extinction. This process should support the tribal groups' request for a fishway around the Shasta Dam, among other related proposals.

The Delta Tunnel and Sites Reservoir should not be prioritized! The California Governor's proposals to build these structures will negatively affect the water levels of our rivers and

further impact the livelihood of tribal groups, not to mention the power and water rates of all California citizens.

With a dwindling California water supply, a long-term drought, and a truly unprecedented global climate emergency, we are experiencing a critical moment for all of humanity. The only hope we have is to adapt to changing conditions through reformation of water policy, prioritization of drinking water for people over corporate agriculture use, and consultation with the indigenous people who can share their knowledge of mutual flourishing within our environment.

Thank you,

Greg C.

92701

From: Clay Haynes
To: BDO Comments, BOR MPR
Subject: [EXTERNAL] Water blueprint San Joaquin Valley
Date: Wednesday, March 16, 2022 10:02:57 PM

To bureau of reclamation:

I've received an email today that said to respond with comments regarding the San Joaquin Valley Blueprint

I'm Clay Haynes, 4th gen farmer from Chowchilla, Ca. I want my kids to be the 5th. I have not been handed down any land from prior generations, farming has had its up and downs, my father was climbing out of the 80's when I came into farming. I've scratched, clawed, fought, and sacrificed everything to get where I'm at today and now at a point where I don't know where to turn or what to do. I tell my son wait 5 years and go work for Caterpillar while I figure out if our state leaders and appointed water mafia make decisions to make water available. It really sucks as he's in his prime learning years and I could really use his help…but I don't want him to waste his time if there's no future

I'm on the Madera County Farm Bureau board and there's really good people serving. It seems the hill is too big to climb for us as we complain amongst ourselves and we are overrun by liberal media and empty promises by local water people who can't fight the environmentalist because of the way laws are written. It's like a slow death and I don't want to give up everything I've worked so hard for. The track we're on leads to no more generational family farms and into corporate investment farms, Wall Street money….no more sense of community pride, friends leaving out of state to escape this madness

There's plenty of water in California with the reservoirs that were put in place to hold water for these dry years. Yes it would be nice to have a few more, or raise some dams, etc. But you can't let all this stored water out to FLUSH OUT THE POLLUTION IN THE DELTA. Everyone knows the delta smelt is the fall guy and it's all smoke and mirrors.

We've got to use commons sense and not rely on computer models that tell a human to open the flood gates. I understand there's pollution and stench in the delta but that's no excuse to let 10,000,000 acre feet of fresh water flow out past the Golden Gate Bridge. It's criminal.

When I started farming on my own in the mid 90's we had surface water deliveries from Feb-Sept, and it was around $28/ ac'. Now we are lucky to get 2-3 months. I think last year it was 3 weeks. We are FORCED TO PUMP BECAUSE ALL THE SURFACE WATER IS MISMANAGED! No wonder there's land subsidence.

I encourage you to read or listen to Victor Davis Hanson. In my opinion, he's the smartest most level headed historian on Farming and Water issues on civilizations around the world both past and present. Selling out this Valley for high speed rail and cheap housing is a huge mistake for our nation….all for the greed of the all mighty dollar which our politicians are blinded by while filling their own pockets which leads to my next point

I've been in these blueprint meetings and It all looks good but in the end it's not going to work. So they want the fisherman, the environmentalists, the farmer, and the developer to work together. So here we are the farmer where every deal since the 80's that's been made has not been in our favor…only because if we didn't take the deal it would be worse! The laws are written in a way that we take the best of a losing deal. We already have no surface water, so they want us to retire some land to put in reservoirs so in wet years we can pump into them so that recharge can happen. In the dry years when we don't have flood waters there will be habitat for wildlife. That's all

we need is environmentalist tromping around looking for an endangered species, next thing you know you can't flood your resevoir. (I honestly don't know if these recharge ponds will even work well, once the deep aquifers are dried up or brackish unusable water, everyone will be competing for the shallow aquifer water that we are trying to recharge with)

Us farmers, when we retire land and sacrifice to conserve water, are the developers going to take up that water that would have been used on the farm and put up developments or businesses that now require WATER ? I'm going to say 100% yes.

They talk of negotiating recirculated water where water can be pumped from the SJ River to the Cal Aqueduct, maybe 3,000,000 ac' of the 10,000,000 ac' but they're killing too many smelt in the process. Are you kidding me ?

Is there that much political control in the Bay Area that they can keep doing this to our San Joaquin Valley ?

This corruption coming from our state leaders Pelosi and Newsom has to stop. Someone has to stop them, AND the people they appoint, fast.

Closing remarks. Let the reservoirs fill up and release the water slowly when this thirsty Valley needs it. That's how our water system was designed.

Thank you for reading this, respectfully,

Clay Haynes

Sent from my iPhone

From: Kyle Herbst
To: BDO Comments, BOR MPR
Subject: [EXTERNAL] Comment Regarding Central Valley Project and the State Water Project
Date: Monday, March 21, 2022 3:15:17 PM

Clean Drinking Water Should Come Before Agriculture Exports: California's water rights system and some of the BOR's contracts are based on 19th century water rights laws, which put large landowners above cities and the environment. This means that not only are California's people water insecure due to agricultural diversions, the Delta, which feeds millions of people's drinking water from has concentrated pesticide levels, toxic algae and saltwater intrusion. It is time to reform water rights laws and agricultural contracts.

Do not Prioritize the Delta Tunnel and Sites Reservoir: California's governor's proposals to build the Sites Reservoir and Delta tunnel under his Water Resilience Portfolio will further dewater California's rivers and impact Tribes and power and water rates. They should not be prioritized in this plan. State water quality updates and flow plans should be.

From: Henry Roller
To: BDO Comments, BOR MPR
Subject: [EXTERNAL] Prioritize Fish in Water Plan
Date: Wednesday, March 30, 2022 11:51:48 PM

California's water rights system and some of the BOR's contracts are based on 19th century water rights laws, which put large landowners above cities and the environment. This means that not only are California's people water insecure due to agricultural diversions, the Delta, which feeds millions of people's drinking water from has concentrated pesticide levels, toxic algae and saltwater intrusion. It is time to reform water rights laws and agricultural contracts. Please prioritize fish over industrial agriculture.

From: michaelwauschek
To: BDO Comments, BOR MPR
Subject: [EXTERNAL] Central valley water project
Date: Friday, March 11, 2022 2:54:47 PM

Hello my name is Michael Wauschek i live in city of Cerritos ca i am concerned of how our current water project is effecting us all but especially to the salmon but as well the smelt also our tribal sovereignty water & food right. It post be about our environment as the people that is effective by low water quality. Without the proper water our earth will die we only have one planet they isn't planet B thanks.

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March 30, 2022

Email: sha-MPR-BDO@usbr.gov

Re: FEIS Scoping for Analyzing Potential Modifications to the Long-Term Operation of the CVP and SWP

The USBR and DWR Have Been Operating the CVP and SWP to Favor Exports from the Delta Watershed Without Regard to Meeting D-1641 (Without Urgency Changes) and other Senior Requirements in Subsequent Dry and Critical Years

The excuse for use of emergency authority to circumvent the law and senior rights has been that rare and never before experienced dry hydrology is occurring. Since 2009 the dry hydrology has been less than rare. The period of detailed records used by the Projects for forecasting is limited and not representative of the more current period. The record based on tree rings and other historical analysis reveals droughts extending 10 years and longer. The planning for Project allocations should be based on the following years being dry such as occurred in the 607 year drought of 1928-1934 or a more constrained period reflecting more current climate change.

More importantly the planning for the projects recognized that water demand within the Delta watershed and in the export areas would exceed the possible development of surplus water from the Delta watershed by the year 2000. The plan was to construct numerous dams and tunnels in the North Coast areas of California so as to supply to the Delta annually an additional 5 million acre feet of surplus water. See ATTACHMENT A.

The planning for the CVP and SWP was to limit exports to water which is truly surplus to the present and future needs within the watersheds of origin and to progressively continue with additional development of surplus water to meet increasing water needs within the watershed and meet increasing Project contractor demands. It was expected that the increasing needs in the Delta watershed and project contractor demand would exceed the available natural flow and Project developed surplus water such that by the year 2000 it would be necessary to supplement water in the Delta annually with 5 million acre feet of surplus water from Project development in North Coast watersheds. The SWRCB application of Term 91 has precluded the right of watershed users to secure appropriative rights for in watershed needs with priority over the Projects. The Projects have been funding and facilitating changes, transfers and utilization of so-called surplus Project water such that permanent residential and agricultural water demand has developed in arid and desert areas without a firm supply.

The FEIS should include an alternative which precludes changes in water rights, export of water or transfer of water from the Delta Watershed to serve uses outside the watershed unless D-1641 requirements (without change) and other senior requirements are and will be met. The water exported or otherwise removed from the Delta Watershed should be limited to that which is truly surplus to the present and future needs within the watershed including the needs of fish and wildlife, the needs of properly functioning habitat and the needs to secure groundwater sustainability.

IT SHOULD BE RECOGNIZED THAT THE STATED FIRST PURPOSE IN THE NOTICE INCLUDES RIVER REGULATION BY WAY OF STORAGE AND RELEASE OF WATER FOR STREAM FLOWS WHICH INCLUDES FLOW FOR SALINITY CONTROL

In United States vs State Water Resources Control Board 182 Cal.App.3d 82 (1986) at pages 135 and 136 the Appellate Court sets forth its analysis supporting the intent of Congress that flow for salinity control is included in river regulation.

The Delta Protection Act of 1959 (WC 12200 et seq.) provides protection in addition to that provided by the area of origin statutes and it is critical that in any case, as a minimum, the export of water through Project facilities which is necessary for salinity control not be allowed.

The policy, promises, law and plans for the SWP and CVP make it clear that the present and future needs within the Delta and other watersheds of origin have priority over exports and that the Projects are limited to water which is truly surplus to such needs.

Standard SWP contract provisions provide:

"(b) In the event that the State is unable to construct sufficient additional conservation facilities to prevent a reduction in the minimum project yield, or if for any other reason there is a reduction in the minimum project yield, which, notwithstanding preventative or remedial measures taken or to be taken by the State, threatens a permanent shortage in the supply of project water to be made available to the contractors:

(1) The annual entitlements and the maximum annual entitlements of all contractors, except to the extent such entitlements may reflect established rights under the area of origin statutes, shall, by amendment of Table A included in Article 6(b), and of Article 7(b), respectively, be reduced proportionately...

(c) In the event that the State, because of the establishment by a party of a prior right to water under the provisions of Sections 11460 through 11463 of the Water code, enters into a contract with such party for a dependable supply of project water, which contract will cause a permanent shortage in the supply of project water to be made available to the District hereunder:

(1) The State shall: ... (ii) revise the District's annual entitlements and maximum annual entitlement, by amendment of Table A..." (See **ATTACHMENT B** pages 18/2 and 18/3 of November 4, 1960 Contract Between the State of California and the Metropolitan Water District of Southern California for a Water Supply)

There should be no doubt that watershed needs are entitled to priority over State contractors for Project water including stored water, previously stored water, foreign water or any other water. The issue of payment for other than incidental benefit remains.

The Delta Protection Act of 1959.

The Delta Protection Act of 1959 (Wat. Code, § 12200 et seq.) establishes the priority for protection of the Delta over exports of water from the Delta.

Recognizing the massiveness of the State Water Resources Development System and the tremendous impacts of exporting millions of acre feet of water from the Delta, the California Legislature imposed special responsibilities on the export projects which are currently the SWP and CVP. Water Code section 12200 et seq. require that the projects provide "salinity control" for the Delta; that the projects integrate to the maximum extent possible releases from storage to maintain an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban and recreational development in the Delta area, provide a common source for exports, and that no water shall be exported which is necessary to meet the Delta requirements.

The interpretation of the Delta Protection Act of 1959 should not be a subject of significant dispute. DWR, the holder of the water rights for the SWP, acknowledged its responsibilities early on. As "Department of Water Resources Bulletin No. 76, Preliminary Edition December 1960 Report to the California Legislature" (See **ATTACHMENT A**) provides:

> "The coordinated use of surplus water in and tributary to the Delta and of regulated or imported supplements to this supply, as required, is referred to as the Delta Pooling Concept. Under this concept of operation the State will ensure a continued supply of water adequate in quantity and quality to meet the needs of export water users. Advantage will be taken of surplus water available in the Delta, and as the demand for water increases and the available surplus supply is reduced by further upstream uses, the State will assume the responsibility of guaranteeing a firm supply of water, which will be accomplished by construction of additional storage facilities and import works. At the same time, the water needs of the Delta will be fully met. [*Id.* p. 11.]
>
> . . .
>
> Further increase in water use in areas tributary to the Delta will worsen the salinity incursion problem and complicate the already complex water rights situation. To maintain and expand the economy of the Delta, it will be necessary to provide an adequate supply of good quality water and protect the lands from the effects of salinity incursion. In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided. [*Id.* p. 12.]
>
> . . .
>
> The California Water code specifies that one of the functions of the State Water Resources Development System is to provide salinity control and an adequate water supply in the Delta. If it is in the public interest to provide substitute supplies in lieu of salinity control, no added financial burden shall be placed on the local water users as a result of such substitution. The code also declares that water to which the Delta is entitled shall not be diverted. It is clearly established that supplying water for the Delta must be a primary and integral function of the State Water Facilities." [*Id.* p. 26.]

Of particular relevance is the Appellate Court Decision in United States vs State Water Resources Control Board cited below. Eight cases against the SWRCB were coordinated and with intervenors all major water interests were parties including the SWRCB, USBR, DWR, Federal Project contractors and State Water Project contractors.

In United States vs State Water Resources Control Board 182 Cal.App.3d 82 (1986) at page 139 the Appellate Court provides:

> "In 1959, when the SWP was authorized, the Legislature enacted the Delta Protection Act. (§§ 12200-12220.) The Legislature recognized the unique water problems in the Delta, particularly 'salinity intrusion,' which mandates the need for such special legislation 'for the protection, conservation, development, control and use of the waters in the Delta for the public good.' (§ 12200.) **The act prohibits project exports from the Delta of water necessary to provide water to which the Delta users are 'entitled' and water which is needed for salinity control and an adequate supply for Delta users.** (§§ 12202, 12203, 12204.)(Emphasis Added)
>
> But the crucial question left unanswered by the protective legislation is exactly what level of salinity control the projects must provide. As noted, the Board concluded that the projects are responsible only for maintaining that level of salinity which would exist in the Delta had the projects never been constructed, the so-called 'without project level. The board declared that if the Delta water users desire a higher level of protection (a greater amount of outflow), they can purchase such 'enhancement water' from the projects."

The Court did not agree with the Board position. At page 117 the Court concluded:

> "Whatever final conclusion is to be drawn from *Antioch* regarding the nature and extent of common law riparian rights to salinity control, existing constitutional and legislative authorities encompass the Board's obligation to protect the quality of the Delta waters from saltwater intrusion. As mentioned above, the water quality legislation unmistakably requires the Board to formulate water quality standards to provide salinity control to 'ensure the reasonable protection of beneficial uses (WC 13241), a statutory classification earlier noted as wide ranging (WC 13050, subd. (f)). Though there can be no doubt concerning the Board's authority to take action to protect the consumptive *uses* (agricultural, industrial and municipal) in the Delta, its approach to that task was seriously flawed by equating its water quality planning function with protection of existing water rights."

At page 141 the Court provided:

> "Thus, the Board's authority in setting water quality standards is *not* limited to the protection of water rights but extends to the protection of all *beneficial uses*

from degradation of water quality, even if the resulting level of water quality exceeds that provided by water rights."

At page 142 The Court provided:

"That independent basis of authority vests jurisdiction in the Board to compel compliance with water quality standards insofar as the project's diversions and exports adversely affect water quality. Such authority, we think, includes the power to impose related costs on the projects."

At page 128 the Court confirmed that providing Salinity control in the Delta was also a major purpose of the Projects:

"Salinity control in the Delta was unquestionably contemplated by state and federal authorities as one of the purposes to be fulfilled by the statewide water projects;"

In furtherance of the determination that protection of the Delta has priority over Project Contractors including exports from the Delta, the Court at page148 provides:

"Thus, both substantively and conceptually, the contractors cannot justify any reasonable expectation of a certain or guaranteed water supply for delivery.

The trial court in the above case determined that there is no obligation on the part of the Delta water users to pay for the incidental benefit from the Project's provision of salinity control for other purposes including fish and wildlife, maintenance of quality at export pumps and meeting public trust needs. The payment obligation only arises from the release of project developed truly surplus waters specifically for the enhancement of Delta water user supply. Eight separate cases were coordinated into Judicial Council Coordination Proceeding No. 548. The parties fell into nine groups: (1) the Board-SWRCB, (2) Delta industries, (3) the central Delta riparians, (4) the south Delta riparians, (5) the U. S. Bureau of Reclamation (the U.S.), (6) the federal contractors, (7) the California Department of Water Resources, (8) the state contractors, and (9) the Contra Costa municipal users. The court addressed the Delta water users' "inchoate right to 'recapture' water being exported by the state and federal projects" under the Watershed of Origin Statute and Delta Protection Act. The court generally concluded that perfection of the right to recapture water being exported would require a Delta user to obtain an appropriation permit and a contract to pay for the recaptured water that was "developed by the projects and that was released specifically for his benefit". Specific to the payment issues the court provided that "Delta users need not pay for salinity control water even if they are incidentally benefited unless the water is released specifically for their benefit", "Delta water users need not pay for the enhanced water quality that results from water released by the projects to maintain adequate water quality at the export pumping stations", "Delta users need not pay for the enhanced water quality resulting from the release of abandoned water", and "Delta users need not pay for the enhanced water quality resulting from water released to preserve or enhance fish or wildlife

resources". (See **ATTACHMENT D,** April 13, 1984 Superior Court decision in the above referenced case of *United States v State Water Resources Control Board*)

CHANGES TO SALINITY CONTROL

The SWRCB has argued that due to its authority to set the level of salinity control it can ignore the prior decisions setting the needed level of salinity control to facilitate a so called emergency change resulting in the export of the very water that would have been used to meet the salinity standard. The D-1641 water quality standards are the result of many days of adjudicatory hearings. The factual and policy basis for the salinity control standard has not changed. The D-1641 salinity standards eliminated the interior delta salinity protection for Striped bass and already incorporate relaxations due to the occurrence of droughts and the expected reoccurrence of dry years. The current plan to meet the standards is based on calculated exceedance using a forecasting period of 30 to 51 years. Such practice ignores the reality that the current and following years could be as dry as those anticipated in the past. Exports of water are allowed before the determination of the hydrology for the then current year, and years thereafter, thus sealing the likely failure to meet the salinity standards. The pattern and practice of the SWP and CVP of not planning to meet the standards in subsequent dry years and the collaboration of the SWRCB in granting temporary urgency changes and avoiding enforcement against the Projects should stop.

The SWRCB was intended to be an independent body that would be free from political influence that could, in the public interest, fairly regulate water quality and administer the allocation of water for appropriative rights including those of the State and United States. Initially the CVP contested state jurisdiction but as a result of Court decisions and congressional directives the CVP was required to meet SWRCB water quality standards. As the SWRCB proceeded with developing water quality standards to protect fish and the environment the Projects and their contractors more aggressively opposed water quality standards thereby resulting in a series of direct interventions by the Governors on behalf of export contractors. Fish and Wildlife Regulatory Agencies were and are working closely in private with the Projects and their contractors and the SWRCB staff to replace water flow needs for fish with habitat. Over time the independence of the SWRCB has deteriorated.

The D-1641 salinity standards even without the emergency relaxation have not been adequate to "protect all beneficial uses from degradation of water quality." A number of Fish species are on the border of extinction and the health and safety of Delta waters is greatly degraded. Although D-1641 standards are basically those put forth by the Project contractors the SWRCB did hold extensive public hearings allowing the introduction of evidence and cross-examination of witnesses. The water quality standards were adopted by the SWRCB and subsequently approved by the United States EPA. The obvious ongoing conflicts of interest in having the State and United States regulating their own projects, the revolving door and interrelationship of staff, injection of politics from Governors through interference with SWRCB enforcement efforts against the Projects and applying emergency powers to circumvent senior water and statutory rights

have further deteriorated the independence of the SWRCB. To suggest that changes in salinity control requirements may be made by way of temporary urgency changes is irresponsible.

b. Watershed Protection Act.

Water Code section 11460 provides:

> **"In the construction and operation by the department of any project under the provisions of this part a watershed or area wherein water originates, or an area immediately adjacent thereto which can conveniently be supplied with water therefrom, shall not be deprived by the department directly or indirectly of the prior right to all of the water reasonably required to adequately supply the beneficial needs of the watershed, area, or any of the inhabitants or property owners therein."**

Water Code section 11128 provides that the limitations also apply to any agency of the State or Federal Government.

Although physically apparent, Water Code section 12931 makes it clear that as to state water resources development the Sacramento-San Joaquin Delta shall be deemed to be within the watershed of the Sacramento River.

Section 11460 applies to the "construction and operation" of both the SWP and CVP. (See *United States v. State Water Resources Control Bd.* (1986) 182 Cal.App.3d 82, 138-139.)

The basic rules of statutory interpretation require that meaning be given to each and every word.

In People v. Weidert (1985) 39 Cal. 3d 836 at page 843 the California Supreme Court provided:

> "It is a settled principle in California law that when statutory language is thus clear and unambiguous there is no need for construction, and courts should not indulge in it. (Citations omitted) This principle is but a recognition that courts 'must follow the language used and give to it its plain meaning, whatever may be thought of the wisdom, expediency, or policy of the act, even if it appears probable that a different object was in the mind of the legislature.'(Citations omitted)"

In the construction and operation of the CVP and SWP, the area where water originates (and the area immediately adjacent thereto) shall not

be deprived **directly or indirectly** of the prior right to all of the water reasonably required.

Water Code section 11460 does not include any reference to exports nor does it limit the protection to any particular type of deprivation. Although deprivation by way of export is prohibited, it is not the only prohibition. The use of the terms "directly or indirectly" confirms the intent to provide the broadest protection so that whatever the scheme devised by the State, Feds and their contractors, the protection would be provided.

The intent of Water Code 11460 is most simply and best set forth in the following statement from February 17, 1945 by R.C. Calland, the Acting Regional Director of the Bureau of Reclamation, to the Joint Committee on Rivers and Flood Control of the California State Legislature. The committee had asked the question, "What is your policy in connection with the amount of water that can be diverted from one watershed to another in proposed diversions?"

In stating the Bureau's policy, Mr. Calland quoted Water Code section 11460 of the State Water Code, which is sometimes referred to as the county of origin act, and then he said:

> **"As viewed by the Bureau, it is the intent of this statute that no water shall be diverted from any watershed which is or will be needed for beneficial uses within that watershed. The Bureau of Reclamation, in its studies for water resources development in the Central Valley, consistently has given full recognition to the policy expressed in this statute by the legislature and the people. The Bureau has attempted to estimate in these studies, and will continue to do so in future studies, what the present and future needs of each watershed will be. The Bureau will not divert from any watershed any water which is needed to satisfy the existing or potential needs within that watershed. For example, no water will be diverted which will be needed for the full development of all of the irrigable lands within the watershed, nor would there be water needed for municipal and industrial purposes or future maintenance of fish and wildlife resources."**

THE SWP AND CVP MUST AT PROJECT EXPENSE DEVELOP WATER THAT IS TRULY SURPLUS TO THE WATER NEEDS IN THE WATERSHEDS OF ORIGIN AND FROM SUCH SURPLUS SUPPLY, MITIGATE FOR ALL DETRIMENT AND MEET THE AFFIRMATIVE OBLIGATIONS OF THE PROJECTS WITH DUE RECOGNITION OF THE PRIORITIES ESTABLISHED BY LAW

The experience of prior dry years has not deterred the Projects from continuing to export water from the Delta without regard to meeting regulatory requirements in subsequent dry years.

The Failure of the Projects to Timely Develop 5 Million Acre Feet or More of Surplus Water and Their Deliberate Relaxation of Restrictions on Use of Temporarily Available

Project Water Has Resulted In Permanent Demand for Residential Development and Permanent Crops in Arid and Desert Areas Which Cannot Be Met

The plan to develop water projects in the North Coast to seasonally provide to the Delta five (5) million acre feet of surplus water by the year 2000 was not implemented. (See **ATTACHMENT C**, December 1960 Bulletin 76 page 13) The lack of this 5 million acre feet results in the SWP not having a supply of water surplus to meeting the needs of the Delta and other areas of origin and to serve the roughly 4.25 million acre feet of so called Table A SWP contract entitlements.

The CVP also suffers from a shortage in meeting even the so-called firm water entitlements in its contracts and has failed to resolve the salt build up in the groundwater and San Joaquin River due to their circumvention of the San Luis Unit requirement for a drain with an outlet to the ocean. Such circumvention increases the demand for water for dilution.

The contracts of both the SWP and CVP clearly contained language conditioning the delivery of water on first meeting senior water rights, salinity control and other regulatory requirements including the rights of those in the areas of origin to recapture project water for local needs. The modification of SWP and CVP contracts, including allowing Contractors to transfer water entitlement for profit (including CVP subsidized water), expansion of places of use, elimination of effective acreage limitations, liberal internal project transfers of water, carry over storage, delivery of nonproject water, and elimination of restrictions on permanent demand creation with temporary supply are some of the actions building demand beyond supply.

Other actions such as the failure to provide a San Joaquin Valley drain with an outlet to the Ocean thus requiring greater amounts of water for dilution of salts, coordinated operation of the SWP and CVP, joint use of points of diversion, use of the Tracy intertie of the California Aqueduct and Delta Mendota Canal, the Cross Valley Canal, various water banks and south of Delta storage all added demand for exports from the Delta.

Operation of the SWP and CVP Projects with priority for exports has resulted in the depletion of stored water, groundwater and natural flow necessary to meet cold water for fish requirements, water quality standards including salinity control, permit terms and conditions, regulatory and statutory conditions and senior water rights in the current and likely subsequent dry years. In Water Year 2021 the Projects reportedly could not meet cold water requirements for salmon in the Sacramento River system and could not meet the salinity control Delta outflow requirements in D-1641. The Projects requested and the SWRCB (through an unlawful delegation) facilitated a Temporary Urgency Change relaxing the salinity control requirements by 1000 cubic feet per second while allowing exports to continue at 1500 cubic feet per second. In addition to being contrary to the above court decision, this resulted in increased salinity intrusion into the Delta. Operation of the export pumps increased the draw of saline water into the Delta from the west. The export of allegedly "stored water" and much of the transferred water aggravates the shortage of cold water for fish and reduces the amount of water otherwise available for salinity control with resulting significant impacts.

Continuing on a path of noncompliance and depleting resources in the watersheds of origin is bad policy and is not sustainable. The SWP and CVP run out of water after one or two

dry years. **ATTACHMENT B** shows the hydrology which guided the SWP and CVP planning and the anticipated shortage in water supply from the Delta watershed. A competent analysis of the SWP and CVP ability to meet obligations and requirements in a six-year drought is required. Such analysis should include consideration of recapture of stored and transfer water previously exported in violation of requirements and water stored in San Luis and water banks which can be returned to the San Joaquin River directly or by way of exchanges to meet SWRCB Delta water quality requirements.

Since 2009 the evidence shows that had exports been sufficiently limited, the water quality standards would have been met. The current crisis is simply the result of continuing the same pattern and practice of the SWRCB, DWR and USBR which wrongly favors exports over senior water rights, regulatory requirements and the public trust.

The 1960 ballot argument in favor of the California Water Resources Development Bond Act which spawned the State Water Project (SWP) included the following representations:

> **"No area will be deprived of water to meet the needs of another nor will any area be asked to pay for water delivered to another."**(Emphasis added)
>
> "Under this Act the water rights of Northern California will remain securely protected."
>
> "A much needed drainage system and water supply will be provided in the San Joaquin Valley."

The Delta Reform Act Water Code section 85031(a) provides:

> "(a) **This division does not diminish, impair, or otherwise affect in any manner whatsoever any area of origin, watershed of origin, county of origin, or any other water rights protections,** including, but not limited to, rights to water appropriated prior to December 19, 1914, provided under the law. This division does not limit or otherwise affect the application of Article 1.7 (commencing with Section 1215) of Chapter 1 of Part 2 of Division 2, Sections 10505, 10505.5, 11128, 11460, 11461, 11462, and 11463, and Sections 12200 to 12220, inclusive." (Emphasis added.)

Water Code Sections 11460 et seq. and 12200 et seq. are particularly specific in defining the limitation on the export of water from the Delta by the SWP and CVP. Water Code sections 11460 et seq. were added by Statutes 1943, around the time of commencement of the CVP. Water Code sections 12200 et seq. were added by Statutes 1959, around the time of commencement of the SWP.

The limitation of the projects to the export of only surplus water and the obligation of the projects to provide salinity control and assure an adequate water supply sufficient to maintain and expand agriculture, industry, urban, and recreational development in the Delta is clear.

Water Code "12200 through 12205 are particularly specific as to the requirements to provide salinity control for the Delta and provide an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban and recreational development.

For ease of reference, the following Water Code sections are quoted with emphasis added:

'12200. Legislative findings and declaration

The Legislature hereby finds that the water problems of the Sacramento-San Joaquin Delta are unique within the State; the Sacramento and San Joaquin Rivers join at the Sacramento-San Joaquin Delta to discharge their fresh water flows into Suisun, San Pablo and San Francisco bays and thence into the Pacific Ocean; the merging of fresh water with saline bay waters and drainage waters and the withdrawal of fresh water for beneficial uses creates an acute problem of salinity intrusion into the vast network of channels and sloughs of the Delta; the State Water Resources Development system has as one of its objectives the transfer of waters from water-surplus areas in the Sacramento Valley and the north coastal area to water-deficient areas to the south and west of the Sacramento-San Joaquin Delta via the Delta; water surplus to the needs of the areas in which it originates is gathered in the Delta and thereby provides a common source of fresh water supply for water-deficient areas. **It is, therefore, hereby declared that a general law cannot be made applicable to said Delta and that the enactment of this law is necessary for the protection, conservation, development, control and use of the waters in the Delta for the public good.** (*Added by Stats. 1959, c. 1766, p. 4247, '1.)*

'12201. Necessity of maintenance of water supply

The Legislature finds that the maintenance of an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban, and recreational development in the Delta area as set forth in Section 12220, Chapter 2, of this part, and to provide a common source of fresh water for export to areas of water deficiency is necessary to the peace, health, safety and welfare of the people of the State, except that delivery of such water shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code. (*Added by Stats. 1959, c. 1766, p 4247, '1.*)

'12202. Salinity control and adequate water supply; substitute water supply; delivery

Among the functions to be provided by the State Water Resources Development System, in coordination with the activities of the United States in providing salinity control for the Delta through operation of the Federal Central Valley Project, shall be the provision of salinity control and an adequate water supply for

the users of water in the Sacramento-San Joaquin Delta. If it is determined to be in the public interest to provide a substitute water supply to the users in said Delta in lieu of that which would be provided as a result of salinity control no added financial burden shall be placed upon said Delta water users solely by virtue of such substitution. Delivery of said substitute water supply shall be subject to the provisions of Section 10505 and Sections 11460 to 11463, inclusive, of this code. (*Added by Stats. 1959, c. 1766, p 4247, '1.*)

'12203. Diversion of waters from channels of delta

It is hereby declared to be the policy of the State that no person, corporation or public or private agency or the State or the United States should divert water from the channels of the Sacramento-San Joaquin Delta to which the users within said Delta are entitled. (*Added by Stats. 1959, c. 1766, p 4249, '1.*)

'12204. Exportation of water from delta

In determining the availability of water for export from the Sacramento-San Joaquin Delta no water shall be exported which is necessary to meet the requirements of Sections 12202 and 12203 of this chapter. (*Added by Stats. 1959, c. 1766, p 4249, '1.*)

'12205. Storage of water; integration of operation and management of release of water

It is the policy of the State that the operation and management of releases from storage into the Sacramento-San Joaquin Delta of water for use outside the area in which such water originates shall be integrated to the maximum extent possible in order to permit the fulfillment of the objectives of this part. (*Added by Stats. 1959, c. 1766, p 4249, '1.)*

The December 1960 DWR Bulletin 76 (**ATTACHMENT A**), which includes a contemporaneous interpretation by DWR of Water Code sections 12200 through 12205 provides at page 12:

> "In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided. (Emphasis added.)

Similarly, the DWR confirmed its interpretation of law in the contract between the State of California Department of Water Resources and the North Delta Water Agency for the Assurance of a Dependable Water Supply of Suitable Quality dated January 28, 1981, which provides:

"(d) The construction and operation of the FCVP and SWP at times have changed and will further change the regimen of rivers tributary to the Sacramento-San Joaquin Delta (Delta) and the regimen of the Delta channels from unregulated flow to regulated flow. This regulation at times improves the quality of water in the Delta and at times diminishes the quality from that which would exist in the absence of the FCVP and SWP. The regulation at times also alters the elevation of water in some Delta channels."

"(f) The general welfare, as well as the rights and requirements of the water users in the Delta, require that there be maintained in the Delta an adequate supply of good quality water for agricultural, municipal and industrial uses."

"(g) The law of the State of California requires protection of the areas within which water originates and the watersheds in which water is developed. The Delta is such an area and within such a watershed. Part 4.5 of Division 6 of the California Water Code affords a first priority to provision of salinity control and maintenance of an adequate water supply in the Delta for reasonable and beneficial uses of water and relegates to lesser priority all exports of water from the Delta to other areas for any purpose." (Emphasis added.)

In SWRCB D-1485 at page 9 the SWRCB provided:

"The Delta Protection Act accords first priority to satisfaction of vested rights and public interest needs for water in the Delta and relegates to lesser priority all exports of water from the Delta to other areas for any purpose."

Water Code section 12205 provides:

"It is the policy of the State that the operation and management of releases from storage into the Sacramento Joaquin Delta of water for use outside the area in which such water originates shall be integrated to the maximum extent possible to permit fulfillment of the objectives of this part."

The objectives include salinity control and an adequate water supply.

The export projects must additionally fully mitigate their respective impacts and meet the affirmative obligations to the Delta and other watershed areas including those related to flow. Failure to so do results in a shift of the cost of the project to someone else.

The California Water Resources Development Bond Act was intended to preclude such a shift in costs. See Goodman v. Riverside (1993) 140 Cal.App.3d 900 at 906 for the requirement that the costs of the entire project be paid by the contractors. In footnote 3 the court provided the following:

> "Governor Pat Brown's press comments at the time are also informative:
>
> "Governor, what is your answer to people who say, 'I don't want to pay for somebody else's water.' Like San Franciscans. 'I have already paid for one water project. Why should I be compelled to buy another?'
>
> "Governor Brown: Well, they won't. The plan itself is completely self-supporting. The law provides that the *contracts* have to provide for the repayment of the cost of the entire Project. That's the real answer to it." (Italics in original)

Water Code section 11912 requires that the costs necessary for the preservation of fish and wildlife be charged to the contractors. The term "preservation" appears to be broader than mitigation and appears to create an affirmative obligation beyond mitigation.

Title 34 of Public Law 102-575 referred to as the Central Valley Project Improvement Act in Section 3406(b) (1) authorizes and directs the Secretary of Interior to enact and implement a program which makes all reasonable efforts to ensure by the year 2002 natural production of anadromous fish (including salmon, steelhead, striped bass, sturgeon and American shad) will be sustainable on a long term basis at levels not less than twice the average levels attained during the period of 1967-1991. Such burden is that of the CVP.

PL-99-546 (HR 3113) (October 27, 1986), put to rest the Congressional intent as to the level of salinity control obligated by the CVP and the question as to any related payment to the CVP. For meeting water quality standards in D-1485 the cost is to be allocated among the project purposes in accordance with existing reclamation law and policy - water and power contractors. The costs for complying with State water quality standards above those standards is to be non-reimbursable.

In 2004 Congress passed another law to ensure that Delta water quality standards and objectives would be met.

PL 108-361 (HR 2828) in pertinent part provides:

"(D) Program to Meet Standards. -

(i) In General. - Prior to increasing export limits from the Delta for the purposes of conveying water to south-of-Delta Central Valley Project contractors **or increasing deliveries through an intertie**, the Secretary shall, not later than 1 year after the date of enactment of this Act, in consultation with the Governor, develop and initiate implementation of a

> project to meet all existing water quality standards and objectives for which the Central Valley Project has responsibility." (Emphasis added)

Such requirement was not accomplished, in that the Delta outflow for salinity control was ignored. The act also provided measures to reduce the demand on New Melones for meeting water quality standards and flow objectives through water purchases and recirculation of water pumped from the Delta back into the San Joaquin River. Such effort was short lived and even the planned recirculation into the San Joaquin River of fish restoration flow has been diverted before it reaches the Delta.

Emergency or other actions including facilitating transfers are clearly for the purpose of increasing exports from the Delta or likely result in use of the intertie, which to the extent such are for serving south-of-Delta Central Valley Project contractors would be directly contrary to the direction of Congress which was to assure that all existing (October 25, 2004) water quality standards and objectives would first be met.

There has been a total disregard by the SWRCB, DWR and the USBR of Water Code section 85201 adopted in 2010 which establishes the policy of the State to reduce reliance on the Delta for future water supply needs. Water Code section 85031 makes it clear that this policy applies to Delta exports and the Delta Reform Act does not diminish, impair or otherwise affect in any manner any area of origin, watershed of origin, county of origin or any other water rights protection, including but not limited to water appropriated prior to December 19, 1914 and protections provided pursuant to Water Code sections 11460 et seq. and 12200 et seq.

The Delta Reform Act of 2009 includes provisions intended to provide additional protection for the Delta. Such provisions include Water Code section85054 which provides:

"Section 85054. Coequal goals

> 'Coequal goals' means the two goals of providing a more reliable water supply for California and protecting restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place."

Water Code section 85021 provides:

"§85021. Reduction of reliance on Delta for future water supply needs

> The policy of the State of California is to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water

technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts."

A Credible Quantification of the Available Water Supply of the CVP and SWP to Meet the Year by Year Regulatory Requirements is Critical to Any Proper Determination of Water Availability for Project Export of Project and Transfer Water Especially as it Relates to Successive Dry Years

The largest water diverters in the Sacramento-San Joaquin Delta Watershed are the federal CVP and SWP. They are projects operated by the United States through its Department of Interior and the State of California through its Department of Water Resources. As such they are regulated by sister agencies thus creating a conflict of interest between public trust and the interest of their water contractors. The conflict is amplified by the interest of the political leadership of our nation and State.

Both projects are based upon the premise that they would construct dams and other facilities to capture surplus flows wasting to the ocean to meet the present and future needs in the watersheds of origin and supply flows in excess to the watershed needs to other areas of the State. Neither project was intended nor had planned to meet all the recognized water needs in the State. The CVP was to serve and subsidize water for farms meeting the 160 acre limitation in limited service areas. It was not intended to meet the water needs of the large land holdings which included large areas of arid land. The CVP built water projects and then contracted water based on classes reflecting the expected firmness of supply. The SWP was a build "as you go" project with contractors paying the entire cost with a limitation and share based on Table A entitlements of about 4.2 million acre feet per year. The SWP plan expected demand in the watersheds of origin to build over time with the demand of its contractors such that by the year 2000, five (5) million acre feet per year would be needed in the Delta from development of dams and pipelines capturing surplus water on North Coast Rivers. Such North Coast development did not take place and the SWP is now operating without the planned supply of surplus water thereby driving the effort to take water away from meeting the needs in the watersheds of origin.

Both projects have the obligation to provide salinity control for the Delta which protects the quality for local and project export diversions, the multiple fish, wildlife, recreation and life safety uses and public trust. Both projects have the obligation to mitigate their adverse impacts including among others blocking fish access to spawning grounds of suitable water temperature, altering natural flows, inducing upstream water diversions and delivering water to the salt loaded portions of the Central Valley without the provision of a Valley drain with an outlet to the ocean which was a precondition to the supply of water to the San Luis Unit. The fish and wildlife obligations of the CVP include the requirements of the CVPIA. The SWP has the obligations to preserve fish and wildlife. (See Water Code section 11912)

DWR contends that the SWP and CVP have had a high degree of success in meeting all operative water quality standards since 1978 claiming that the temporary urgency changes granted by the SWRCB using emergency authority were justifiable due to factors beyond the SWP/CVP reasonable control. Drought conditions are really not emergencies but historically reoccurring events. There is some future variability that cannot be accurately predicted and the

information available to describe the past variability has limitations. The fact remains that the planning for both the SWP and CVP anticipated a reoccurrence of hydrology similar to the 6 year drought of 1928/29 through 1934 to estimate the firm yield of the projects to supply such firm yield in the sixth year of such drought. The importance of determination of such firm yield is to alert contractors of the reasonable expectation of delivery. The contracts contained exculpatory provisions making even such firm yield delivery subject to senior rights (including watershed of origin rights to recapture water from the Projects), variable hydrology and other measures not controllable by the Projects. In determining firm yield, the depletion of reservoir storage in the early years of a drought impacts the ability to supply water in the later years. It appears that optimism or political factors have influenced the Project decisions to take more water in the early years and gamble with availability in the later years. This practice and changes in contract provisions have fueled the increased development of permanent type demand based on infirm supply.

In the past, regulatory compliance has been equated to water quality control plan standards as relaxed by temporary urgency changes. The D-1641 water quality standards do not contain fixed objectives for cold water requirements to protect salmon spawning. Instead there is a process for developing a recommendation to the executive director of the SWRCB who determines the requirement on a real time basis. This process has resulted in the SWP and CVP inability to meet regulatory fishery requirements in even the first or second year of a drought. Water quality standards reflect a balancing process to establish minimum requirements protective of specific uses and allow for substantial degradation of pre-existing water quality in various areas of the watersheds including by example the San Joaquin River. Adequate control of health and safety threats in the Delta such as microcystis and increasing methylation of mercury are absent.

The original planning for the SWP and CVP appears to have underestimated the needs to protect fish both as to flow requirements and carryover storage required for temperature control. Without the planned 5 million acre feet of water annually from the North Coast the problem is greater and there is no truly surplus water for export except in wet years.

Water storage projects typically store natural flow in the winter and spring. The winter and spring natural flows, except in wetter years, would provide flushing of salts from the rivers flowing into the Delta and from the Delta into the Bay such that salt balance in the soil can be maintained and adequate protection can be provided to fish and wildlife and other Delta water uses. This flushing action drives saline water farther out into the Bay thereby prolonging the availability of good water quality in the Delta pool. When the stored water is used within the watershed, the return flow is basically delayed return of natural flow. The improved summer flow is an offset or mitigation for reduced winter and spring flows. The balance is in effect a physical solution that advances the beneficial use of water.

The equity of such a physical solution is reflected in the statutory obligations of the SWP and CVP to the Delta including salinity control and in the conditions imposed on the water rights for such projects. Such statutory obligations require both mitigation and improvement.

The adverse impacts to Delta water supply and quality from State and Federal actions were clearly recognized. The near complete re-diversion of the Upper San Joaquin River to the south by way of the Friant Dam and Friant Kern canal deprived the Delta of the late spring and summer natural flow from the high Sierra snowmelt; the reverse flows and induced Bay salinity intrusion caused by export diversions; the increased salinity entering the San Joaquin River by reason of delivery of water to the west side of the San Joaquin River without a valley drain with an outlet to the ocean; the induced salinity intrusion from the Bay caused by channel enlargement for the Stockton and Sacramento ship channels; the reduced late spring and summer natural flows resulting from the State and Federal flood control projects; inducement of salinity intrusion by reason of planned permanent flooding of areas in the Delta which increase the tidal prism and the project inducement of upstream development are examples. All of the above have the result of degradation of water quality in the Delta for which the projects are responsible.

In addition to the mitigation or physical solution aspects driving the statutory commitments of the SWP and CVP to provide stored water to the Delta was the purpose of providing such salinity control to benefit a broad range of purposes. Such purposes include protection of water quality at the CVP Tracy export pumps, the SWP export pumping facilities at Clifton Court, the Contra Costa Water District intakes, the Montezuma Slough gates to serve the Suisun Marsh, and the North Bay Aqueduct. Protection of fish and wildlife, protection of water quality in the bays and meeting project contractual commitments are also served.

The SWP and CVP Obligation to Provide Salinity Control for the Delta Was and is Supported by Many Factors

The importance of agricultural production from the Delta was of great importance and avoidance of the 1931 salinity intrusion and other detrimental intrusions was critical. It was recognized that diverting the San Joaquin River flow at Friant would deprive the Delta of much of the historical flows of high quality Sierra snow melt. It was recognized that export pumps would create an additional draw of water from the Bay that needed to be offset to protect Delta water quality including water quality at the export pumps. It was recognized that channels were enlarged in the Western Delta for flood control and navigation and that such induced salinity intrusion. It was also recognized that the projects would as intended induce greater use of water in the watershed thus reducing flow through the Delta. The policy was clearly intended to meet the present and future needs for full development within the Delta and other areas of origin and only export surplus water. The logic of not developing arid lands by depriving areas near the water supply holds true today.

THE PLAN TO USE DELTA ECOSYSTEM IMPROVEMENTS WHICH CONVERT AGRICULTURAL LAND TO HABITAT AS A SUBSTITUTE FOR REDUCING SWP AND CVP DIVERSION AND EXPORT OF WATER OTHERWISE NEEDED TO PROVIDE ADEQUATE WATER FLOW AND QUALITY FOR FISH AND OTHER DELTA NEEDS LACKS EVIDENTARY SUPPORT

There is strong evidence indicating that fish need water flowing into and out of the Delta to the Bay. The timing and amounts are the subject of ongoing debate and evaluation.

The SWP and CVP affect flow into and out of the Delta primarily through diversions to storage, direct diversions from the tributaries and diversions from locations in the Delta to areas outside the Delta. The reliability of water supply for fish at times directly conflicts with the reliability of the water supply for SWP and CVP deliveries for other purposes and in particular exports from the Delta. The priorities for providing such reliability are established by law.

Water Code Section 85086 of the Delta Reform Act of 2009 assigned to the SWRCB the task of determining instream flow needs and new flow criteria for the Delta ecosystem necessary to protect public trust resources. Such determinations have not yet been finalized and are subject to significant controversy.

Driving the need for ecosystem restoration is the need to address the dramatic decline in fish species and in particular those in danger of extinction. The proposition that habitat in the Delta and factors other than the amount flow into and through the Delta are the cause of the subject fish declines discounts the impact of SWP and CVP exports on the amount of flow into and through the Delta from diversion to storage and direct diversion.

The correlation between SWP and CVP exports and the decline of the fisheries has been a concern for many years. In August of 1978 the State Water Resources Control Board rendered its Water Right Decision 1485. The Decision was the culmination of 32 days of evidentiary hearing initiated on November 15, 1976 and concluded on October 7, 1977. At that time the striped bass index was considered to be the indicator of ecosystem health for the Delta and Suisun Marsh. Striped bass were in effect the "canary in the coal mine". As the years passed and striped bass populations plummeted, the water exporters claimed striped bass to be invasive species, predators on endangered species and a major cause of fish declines wrongfully attributed to the export of water. The canary died and the death was ignored to facilitate greater exports. As **ATTACHMENTS E-H** show, striped bass, steelhead, Delta smelt, fall-run Chinook salmon and winter-run Chinook salmon all co-existed at relatively high populations at lower export levels.

In 1978 the SWRCB concluded in D-1485 at page 13 that:

> "To provide full mitigation of project impacts on all fishery species now would require the virtual shutting down of the project export pumps." (See **ATTACHMENT I)**

The SWRCB also concluded in D-1485 at page 14 that:

> "Full protection of Suisun Marsh now could be accomplished only by requiring up to 2 million acre feet of

fresh water outflow in dry and critical years in addition to that required to meet other standards." (See **ATTACHMENT I**)

Exports from the Delta were not curtailed and the additional 2 million acre feet of outflow was not provided for the marsh.

ATTACHMENTS E-H show that significant declines in fish populations commenced when annual exports reached 2 million acre feet. Increased development in the watersheds and the effects of climate change would indicate that additional surplus water yield would have to be developed to provide a comparable level of fish protection for the future and maintain even the 2 million acre feet of exports much less the full amount of export contracts. Little or no export water in dry years and more in wet years would likely help but the Delta watershed cannot produce the needed water. The planners of the SWP determined that by the year 2000 no water would be available for export without major water development in the North Coast.

An examination of the fish population graphs indicates that restoration of the ecosystem for fish is not correlated with Delta wetland habitat conditions in the 1850's or at all. The likely relationship is to water conditions, particularly flow.

The Delta was fully leveed and reclaimed by about 1930.

"By 1930 all but minor areas of the swampland had been leveed and were in production." (See page 8 of December 1960 Bulletin 76 – **ATTACHMENT A**.) The USACE completed project levee construction on the San Joaquin River in the early 1960's. There are no significant changes in leveed areas or even riverine habitat which appear to be the cause of the decline of the fisheries. In fact, there have been increases in Delta wetland habitat, including tidal wetland, during the periods of apparent decline. Mildred Island flooded in 1983 and has not been reclaimed. Little Mandeville and Little Frank's Tract flooded in the 1980's and have not been reclaimed. Lower Liberty Island levees were not restored and the area has been in a tidal wetland condition since at least 2002.

The focus on conversion of Delta land to habitat as a substitute for water for fish is misplaced and the result of the inappropriate commitment to increase exports. Adequate analysis has not been done to determine if development of shallow tidal and other wetland habitat in the Delta and other locations is actually detrimental to salmon and other anadromous fish. In particular, stranding and predation from otters, egrets, herons, cormorants, gulls, white pelicans, other fish and the like have been identified as a serious concern.

The limited study (**ATTACHMENT J**) showing a picture of larger salmon smolts raised for a time in a wetland versus smaller smolts raised in the channel is cited as the evidence that shallow seasonal wetland in the Delta would" be a substitute for flow and justification for a 50 year take permit. The study monitored caged smolts in the channel where the fish must constantly swim against the current and compared those smolts to smolts in cages in shallow wetlands where there was little or no current. The experiment did not attempt to evaluate stranding or predation and it is doubtful that the smolts in the channel cages if uncaged would spend as much time swimming against the stronger currents rather than seeking areas of the channel where the velocity is lower. The presentation of results including the fat fish/skinny fish photo neglected to show the sizes of the fish from the cages in the channel upstream of the shallow habitat which reportedly were comparable to those in the wetlands. "During periods of low, clear water, fish growth rates in the river site above the floodplain were comparable to those in the floodplain." (**ATTACHMENT J**, pg. 1.)

Creation of Floodplain Habitat Is Not a Substitute for Flow

The available evidence and studies do not support such a substitution. The floodplain habitat which is suggested as potentially beneficial is that which is inundated by high flows for a limited period; involves a large area of water of a proper depth to help avoid predation; assumes avian predator populations are limited; is properly drained to avoid stranding and avoids increased water temperatures detrimental to salmonids.

The Jeff Opperman Final Report for Fellowship R/SF-4 referenced above containing the picture of the fat fish and skinny fish is often shown as support for the proposition that floodplain habitat can be substituted for flow (**ATTACHMENT J**) The study does not put forth that conclusion but suggests "that juvenile Chinook benefit from access to floodplain habitats". (Page 2) It is important to recognize that the test fish were caged and thus predation from birds, fish and other animals was not an issue. Stranding was down-played but admittedly not tested. The test was conducted in and along the Cosumnes River. The skinny fish were in the river swimming against the current and because they were in cages and couldn't move with the current or move to quiet and more productive water. The fat fish obviously saved their energy for growth and apparently benefitted from improved food availability. The report states "During high flows the river offers poor habitat and fish living in this type of habitat will tend to be displaced downstream." High flows and displacement downstream are likely not detrimental. It is generally accepted that the salmon do well in high flow years. The return of adults (escapement) is usually higher two and one-half years after a high flow year. It is recognized that ocean conditions also play a part and may in some cases reduce escapement nullifying the benefit of high flow. The difference in food availability in the high flow channel versus in the quiet water may not be significant in the test given the consumption of energy and lack of opportunity for the skinny fish to move to more favorable parts of the river. Displacement downstream into the cooler and more productive parts of the estuary is likely not bad for displaced salmon smolts.

Floodplain Habitat Not Accompanied by High Flow Does Not Appear to Result in Increased Chinook Salmon Ocean Survival and May Not Improve

Survival of Sacramento River Juvenile Chinook Salmon Migrating to the Ocean

In the study titled "Floodplain Rearing of Juvenile Chinook Salmon: Evidence of enhanced growth and survival" by Sommer, et al. (2001), a copy of which is Exhibit 27, tests were conducted in the Yolo Bypass in 1998 and 1999. The study concluded that during such years salmon increased in size substantially faster in the seasonally inundated agricultural floodplain than in the river, suggesting better growth rates. The study, however, provides: "Survival indices for coded-wire-tagged groups were somewhat higher for those released in the floodplain than for those released in the river, but the differences were not statistically significant. Growth, survival, feeding success, and prey availability were higher in 1998 than in 1999, a year in which flow was more moderate indicating that hydrology affects the quality of floodplain rearing habitat". (**ATTACHMENT K**, pg. 1.)

In the discussion the authors provide:

> "Mean length increased faster in the Yolo Bypass during each study year, and CWT fish released in the Yolo Bypass were larger and had higher apparent growth rates than those released in the Sacramento River. It is possible that these observations are due to higher mortality rates of smaller individuals in the Yolo Bypass or of larger individuals in the Sacramento River; however we have no data or reasonable mechanism to support this argument."
>
> "Elevated Yolo Bypass survival rates are also consistent with significantly faster migration rates in 1998, the likely result of which would be reduced exposure time to mortality risks in the delta, including predation and water diversions."

In the study "Habitat Use and Stranding Risk of Juvenile Chinook Salmon on a Seasonal Floodplain" by Sommer, et al. (2004), a copy of which is **ATTACHMENT L**, the authors build upon the above study with further testing in 2000 and present their analysis of ocean survival.

The author's abstract provides:

> "Although juvenile Chinook salmon *Oncorhynchus tshawytscha* are known to use a variety of habitats, their use of seasonal floodplains, a highly variable and potentially risky habitat, has not been studied extensively. Particularly unclear is whether a seasonal floodplain is a net "source" or net "sink" for salmonid production ... Adult ocean recoveries of tagged hatchery fish indicate that seasonal floodplains support survival at least comparable with that of adjacent perennial river channels. These results indicate that floodplains appear to be a viable rearing habitat for Chinook salmon, making floodplain restoration an important tool for enhancing salmon production. (Emphasis added.)

The data provided for ocean survival is as follows:

Table 1. - Number of coded wire tags recovered in the ocean and commercial fisheries for Chinook salmon released in the Yolo Bypass and Sacramento River. The total number of tagged fish released in each location for each year is shown in parentheses. The survival ration is calculated as the number of Yolo Bypass recoveries divided by the number of Sacramento River recoveries.

Release Group	1998 (53,000)	1999 (105,000)	2000 (55,000)
Yolo Bypass	75	136	27
Sacramento River	35	138	47
Survival Ratio	2.14	0.99	0.57

In 1998 Yolo Bypass looked like a benefit, in 1999 it was a push and in 2000 Yolo Bypass looked like a detriment.

It is assumed that shaded river aquatic habitat is desirable for special status fish. Some experts contend there is a need to control predators by removing structures which affect flow fields and provide shade. The focus appears to be on abandoned docks, pilings and the like, however, shaded river aquatic habitat can provide the same effect on flow and provide shade. The impact of shaded river aquatic habitat on special status fish is unclear.

There are a number of significant adverse impacts associated with so-called restoration of tidal floodplain habitat within the Delta which have not been objectively considered or mitigated.

In the Delta where the waters are tidal the proposed habitat restoration is not necessarily floodplain but rather is tidal wetlands which is inundated most if not all of the time.

Increased salinity intrusion could result from the increased tidal prism and/or creation of shortened pathways to the interior Delta and particularly to the large S WP and CVP intakes whether in the north Delta or south Delta.

Setting back, breaching, degrading and/or not restoring levees in the Delta has significant adverse impacts.

Increases in the tidal prism at locations similar to and including the area in and around the lower Yolo bypass not only induces greater salinity intrusion, but also results in advection adversely affecting the out migration of salmon smolts some of which are endangered.

The regularly or permanently inundated areas constitute increased habitat for predator species and increase ambush locations affecting the fish species of concern. The increase in water surface and wetland vegetation will greatly increase the temperature and evaporation and evapotranspiration of fresh water. In many cases there is an increased threat of flooding to surrounding areas due to increased fetch and wave action across the habitat area and increased

seepage into adjoining levees and lands. Other significant adverse impacts include propagation of vectors including disease bearing mosquitoes, production of methyl Mercury and toxic algal blooms.

There is also the harm to and loss of agricultural land and production.

ATTACHMENT M contains excerpts from the April 2011 report by Dave Vogel titled "Insights into the Problems, Progress, and Potential Solutions for Sacramento River Basin Anadromous Fish Restoration" prepared for the Northern California Water Association and Sacramento Valley Water Users contains the results of studies which include the Liberty Island Ecological Reserve area. (The entire study can be viewed on the Northern California Water Association website by clicking on "Fisheries")

At pages 112 and 113 the report provides:

> Subsequent, additional juvenile salmon telemetry studies were conducted by Natural Resource Scientists Inc. on behalf of the USFWS and CALFED in the north Delta (Vogel 2001, Vogel 2004). Triangulating radio-tagged fish locations in real time (Figure 61) clearly demonstrated how juvenile salmon move long distances with the tides and were advected into regions with very large tidal prisms, such as upstream into Cache Slough and into the flooded Prospect and Liberty Islands (Figure 62). During the studies, it was determined that some radio-tagged salmon were eaten by predatory fish in northern Cache Slough, near the levee breaches into flooded islands (discussed below).

At page 120 the report provides:

> During recent years, there has been an emphasis to reclaim or create shallow, tidal wetlands to assist in re-recreating the form and function of ecosystem processes in the Delta with the intent of benefitting native fish species (Simenstad et al. 1999). Among a variety of measures to create such wetlands, Delta island levees either have been breached purposefully or have remained unrepaired so the islands became flooded. A recent example is the flooding of Prospect Island which was implemented under the auspices of creating shallow water habitat to benefit native fish species such as anadromous fish (Christophel et al. 1999). Initial fish sampling of the habitat created in Prospect Island suggested the expected benefits may not have been realized due to an apparent dominance of non-native fish (Christophel et al. 1999). Importantly, a marked reduction of sediment load to the Delta in the past century (Shvidchenko et al. 2004) has implications in the long-term viability of natural conversion of deep water habitats on flooded Delta islands into shallow, tidal wetlands. The very low rates of sediment accretion on flooded Delta islands indicate it would take many years to convert the present-day habitats to intertidal elevations which has potentially serious implications for fish restoration (Nobriga and Chotkowski (2000) due to likely favorable conditions for non-salmonid fish species that can prey on juvenile salmon. Studies of the shallow water habitats at flooded Delta

islands showed that striped bass and largemouth bass represented 88 percent of the individuals among 20 fish species sampled (Nobriga et al. 2003).

There have likely been significant adverse, unintended consequences of breaching levees in the Delta. There is a high probability that site-specific conditions at the breaches have resulted in hazards for juvenile anadromous fish through the creation of favorable predator habitats. The breaches have changed the tidal prisms in the Delta and can change the degree in which juvenile fish are advected back and forth with the tides (Figure 61; previously discussed). Additionally, many of the breaches were narrow which have created deep scour holes favoring predatory fish. Sport anglers are often seen fishing at these sites during flood or ebb tides. Breaching the levees at Liberty Island is an example (Figure 72 and 73). Recent acoustic-tagging of striped bass in this vicinity confirmed a high presence of striped bass (Figure 74, D. Vogel, unpub. data.)

The increased loss of fresh water due to creation of tidal and wetland habitat is clear. **ATTACHMENT N** is Table A-5 from DWR Bulletin 168, October 1978 which shows the annual Et values for various crops and for Riparian Vegetation and Water Surface. The Riparian Vegetation and Water Surface 67.5 inches can be compared to tomatoes 33.8 inches and alfalfa 46.0 inches. The increased fresh water loss is from 33.7 inches when compared to tomatoes and 21.5 when compared to alfalfa. The increased loss of fresh water is particularly significant in drier years.

The Division of Water Resources (predecessor to The Department of Water Resources) in the Sacramento - San Joaquin Water Supervisor's report for the year 1931 dated August 1932 and designated Bulletin 23 includes the results of studies of water consumption of tules and cat-tails. **ATTACHMENT O** includes Tables 69, 74, 75 and 77 from such report. Consumptive use for open water surface is shown as 4.91 acre feet per acre, tules at 9.63 acre feet per acre, and alfalfa at 3.51 acre feet per acre. To examine the relatively high consumptive use for tules the U.S. Department of Agriculture undertook a continuation of the study of consumptive use for asparagus, tules and cattails. The tables show an average of 14.63 acre feet per acre for cat-tails and 13.48 acre feet per acre for tules. Results from cat-tails and tules grown in tanks at Camp 3, King Island for 1931 are shown in Table 77. The results for normal sized tules was 8.0 acre feet per acre.

ANTI-DEGRADATION POLICIES, THE DELTA REFORM ACT AND WATER CODE SECTIONS 12200 ET SEQ. MUST BE RECOGNIZED AND APPLIED IN THE FEIS EVALUATIONS

Salinity control and an adequate water supply in the Delta sufficient to maintain and expand agriculture, industry, urban and recreational development in the Delta area is a precondition to the SWP and CVP export of water from the Delta. Additionally the projects must reduce reliance on exports from the Delta and as coequal goals provide a more reliable water supply for California including the Delta and protect, restore and enhance the Delta ecosystem. See Water Code section 85054. The unique cultural, recreational, natural resource, and agricultural values of the Delta are specifically referenced.

For agriculture in much of the Delta including the central Delta salt accumulates in the soil as a result of evapotranspiration and surface evaporation. Due to soil types, shallow groundwater levels and crop limitations increasing leaching fractions by application of greater quantities of irrigation water is not feasible. Salt balance requires application of good quality water during periods of irrigation such that rainfall will achieve the leaching of salts from the soil necessary to achieve salt balance. Control of land use in the Primary zone of the Delta is intended to assure that this area remains in agricultural use including the growing of grain and other forage crops to sustain the wintering waterfowl of the Pacific Flyway and other important wildlife. Typically winter flooding is used to saturate the soil so that winter rains can drive the accumulated salts from the root zone for growing the customary crops. Leaching of salts can be accomplished through special land grading with containment dikes and open drains in close proximity that allow applied water to push salts from the root zone area. The process is very expensive and only applicable to growing high value crops.

Compliance with water quality objectives for agricultural uses rather than avoidance of degradation assumes that the objectives avoid significant harm. There is no supporting analysis for such assumption. The significant adverse impact to water quality from reduced Delta Outflow and tidal and other wetland habitat development must be considered. Increased salinity intrusion from increases of the tidal prism, shortening the path for salinity intrusion and increased evaporative losses will result from tidal wetland development.

Degradation is the result of the desire to increase exports and is inconsistent with the Delta Reform Act requirements to honor the statutory and water right priorities, enhance Delta agricultural values, reduce reliance on the Delta and make the Delta water supply more reliable. The SWRCB has in the past viewed the water quality objectives for specific uses as a composite providing protection for all beneficial uses. Changes in objectives for a particular use will likely impact protection for other beneficial uses.

Increases in methyl mercury concentration results from the creation of habitat purportedly beneficial to fish. The substitute of habitat for flow appears to be the justification for fish agency accord for export of water that is not surplus to the needs of the Delta and other areas of origin. Improvement of Delta water quality and flow with reduction of exports so as to provide sufficient conditions to protect fish would avoid the need for habitat measures which increase methyl mercury.

Toxic algal blooms and microcystis are already a significant health hazard in the Delta to recreational users, animals, and even fish. The Delta is a source of drinking water for export and local users and possibility of transmission of toxins is real. Degradation of Delta water quality will substantially increase the health risk from such algal blooms. Cumulative impacts with likely future projects and actions will greatly increase the adverse impacts. Elimination of the flushing action and dilution from the cross-delta flow and outflow will increase residence time in many locations and increase the concentration of constituents contributing to algal blooms. Water temperature and clarity increases could also result.

The microcystis impacts from habitat development could certainly be mitigated by avoiding those projects which create the problem. The impacts to fish which habitat development is intended to mitigate can be greatly mitigated with water flow and other measures including the timing and reduction of export of water which is not truly surplus to the needs within the Delta watershed.

AN HONEST EVALUATION OF SUPPLY AND DEMAND AND THE LACK OF FIRM WATER SUPPLY IS LONG OVERDUE

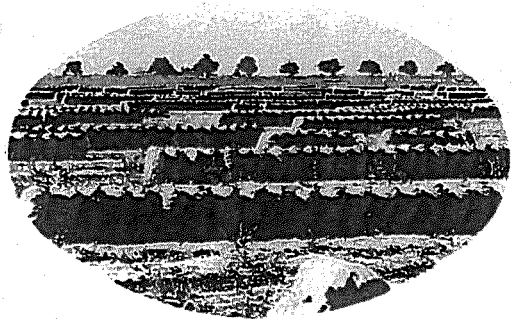
The FEIS analysis must include both supply and demand including the demands from relatively uncontrolled development of arid and desert lands. There is clearly a shortage from the failure to develop the 5 million acre feet of water from the North Coast. The huge depletion of groundwater in both the watersheds of origin, the Project export areas and balance of the State must also be included. The depletion of groundwater storage and depletion of accretions to surface waters due to transfers of water based on groundwater substitution and fallowing must be considered.

It is urged that a competent analysis be performed of the SWP and CVP availability of water which is truly surplus to the present and future needs within the Delta watershed and when and how much water may be available for export. Exports of transfer water and Project water should not be allowed to the detriment of meeting needs within the watershed including fish and wildlife needs.

Respectfully submitted,

Dante John Nomellini Sr

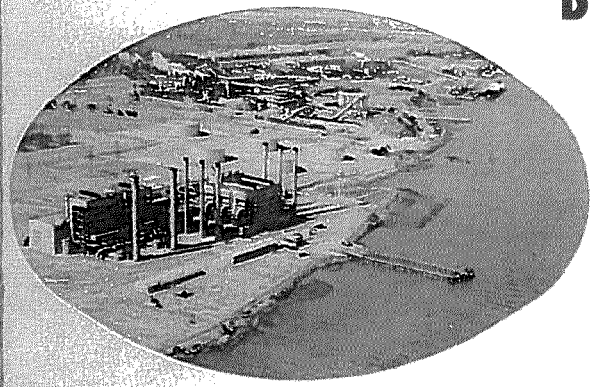
John A. Wilson

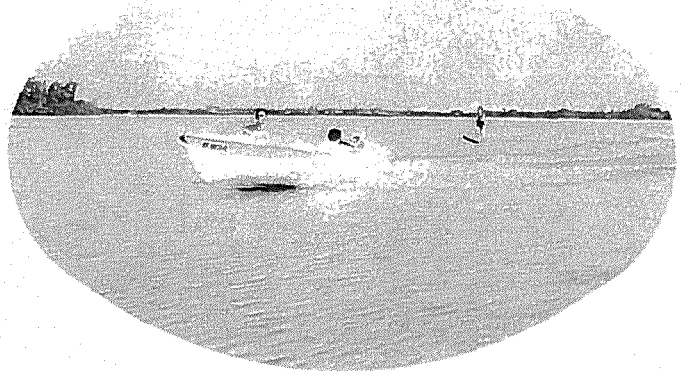


Preliminary Edition

Bulletin No. 76

DELTA WATER FACILITIES





EDMUND G. BROWN
Governor
State of California

December, 1960

HARVEY O. BANKS
Director
Department of Water Resources

Attachment A

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

Bulletin No. 76

REPORT TO THE
CALIFORNIA STATE LEGISLATURE

ON THE

DELTA WATER FACILITIES

AS AN INTEGRAL FEATURE OF

THE STATE WATER RESOURCES DEVELOPMENT SYSTEM

STATEMENT OF CLARIFICATION

This preliminary edition presents a comparison of alternative solutions to the Delta problems. This bulletin shows that the Single Purpose Delta Water Project is the essential minimum project for successful operation of the State Water Facilities. This bulletin also presents, for local consideration, optional modifications of the Single Purpose Delta Water Project which would provide additional local benefits.

The evaluation of project accomplishments, benefit-cost ratios, and costs of project services, are intended only to indicate the relative merits of these solutions and should not be considered in terms of absolute values. Benefits related to recreation are evaluated for comparative purposes. Detailed recreation studies, presently in progress, will indicate specific recreation benefits.

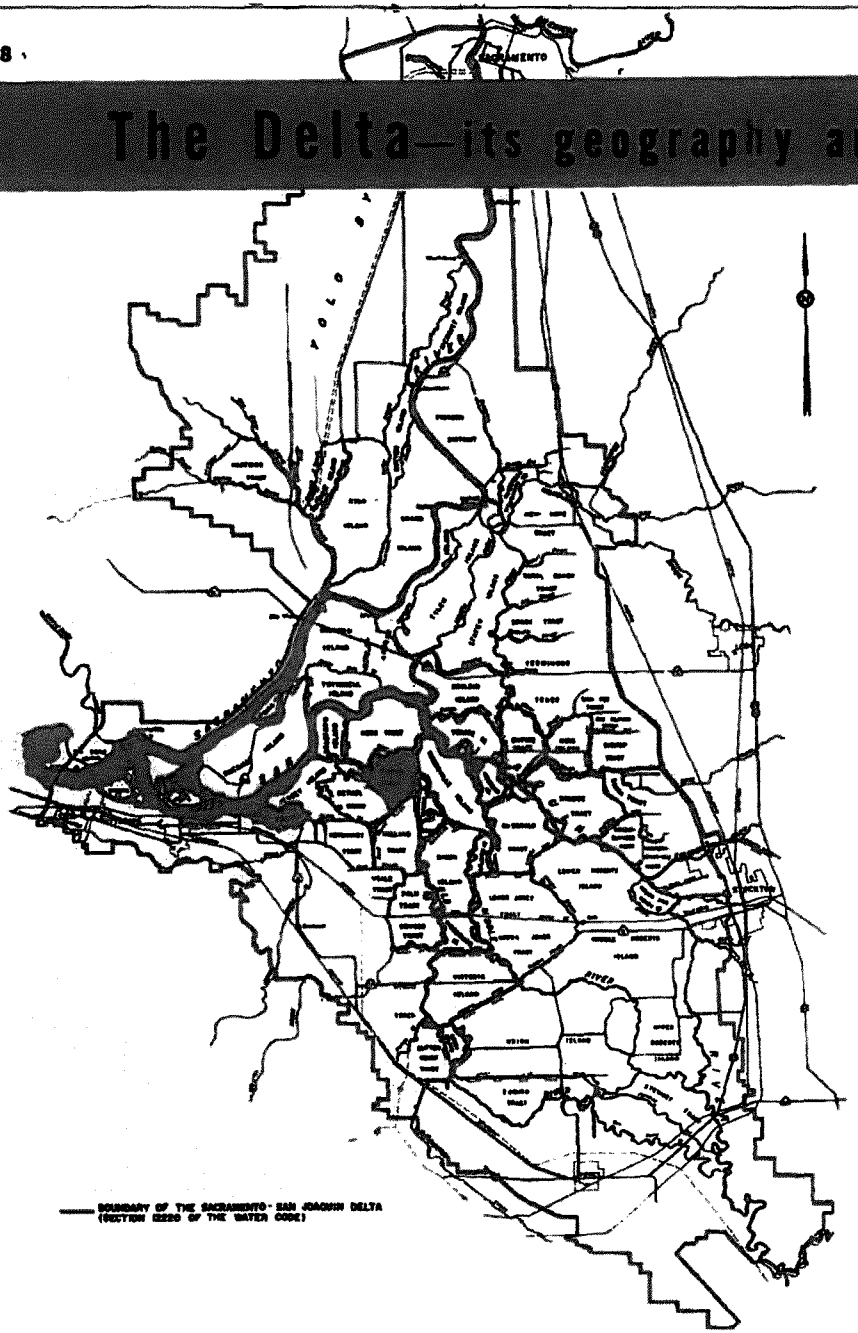
Subsequent to local review and public hearings on this preliminary edition, a final edition will be prepared setting forth an adopted plan. The adopted plan will include, in addition to the essential minimum facilities, those justifiable optional modifications requested by local entities.

EDMUND G. BROWN
Governor

HARVEY O. BANKS
Director

December, 1960

The Delta—its geography and economy

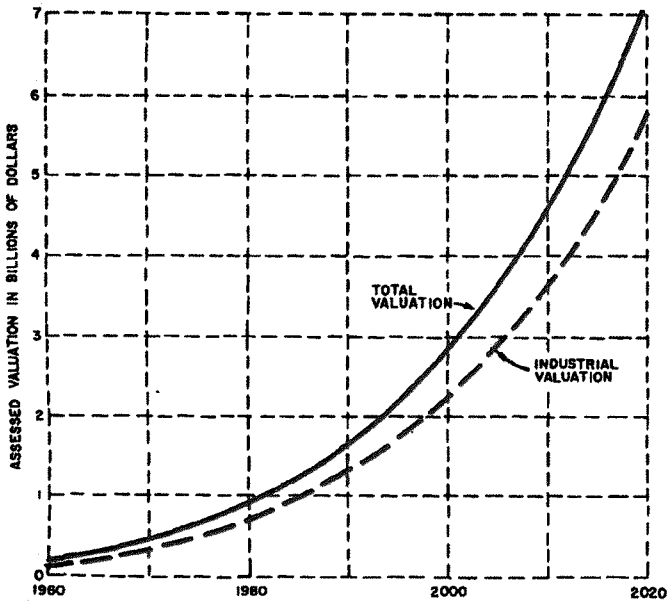


The Delta, located at the confluence of the Sacramento and San Joaquin Rivers system, is a unique feature of the California landscape. The Delta encompasses some 738,000 acres, interlaced with 700 miles of meandering waterways covering 50,000 acres. About 415,000 acres of land, referred to as Delta Lowlands, lie between elevations of 5 feet above and 20 feet below sea level. This area is composed of peat, organic sediments, and alluvium, and is protected from flood water and high tides by man-made levees. The extensive waterways afford opportunity for shipping and provide a wonderland for boating and water sports. These same waterways must safely discharge flood waters of the Central Valley.

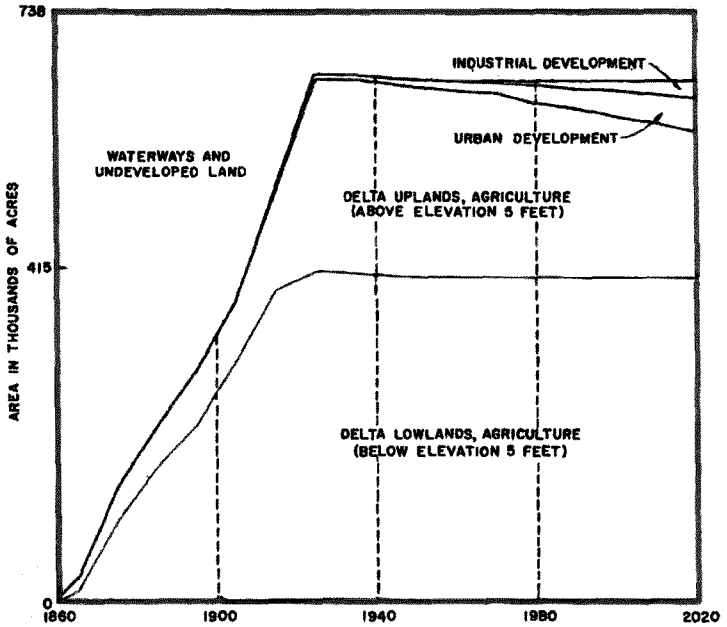
The fortunate combination of fertile soils, convenient water supplies, and shallow-draft shipping to central California markets led to development of an intensified agricultural economy in the Delta. Initial reclamation of the marshlands began slowly in the 1850's, but rapidly expanded after state assistance was provided by a swampland act in 1861. By 1930, all but minor areas of the swamplands had been leveed and were in production.

The Delta has historically been noted for its asparagus, potatoes, celery, and varied truck crops. Recently, greater emphasis has been placed on field corn, milo, grain, and hay, although the Delta still produces most of the nation's canned asparagus. The Delta's agricultural economy for many years was dependent upon repulsion of ocean salinity by fresh water outflow, which fluctuated widely, but during the past sixteen years has been protected largely by releases from upstream reservoirs of the Federal Central Valley Project during summer months.

Several towns and cities are located in the upland areas and an industrial complex is expanding in the western part of the Delta. Early industrial development centered around food and kindred products, steel production, fibreboard, lumber, and shipbuilding activity. Large water-using industries, such as steel, paper products, and chemicals, have developed in the western area where water, rail, and highway transportation, coupled with water supplies, has stimulated growth. The manufacturing employment in this area was about 10,000 people in 1960.



PROJECTED ASSESSED VALUATIONS WITHIN THE WESTERN DELTA STUDY AREA



TRENDS IN LAND USE

A deep-draft ship channel serving commercial and military installations terminates at Stockton, and another is being constructed to Sacramento. Water-borne shipments in the Delta amounted to about 6,000,000 tons annually in recent years.

The Delta encompasses one of California's most important high quality natural gas fields. Since 1941 the field has produced about 300,000,000 cubic feet of methane gas for use in the San Francisco Bay area.

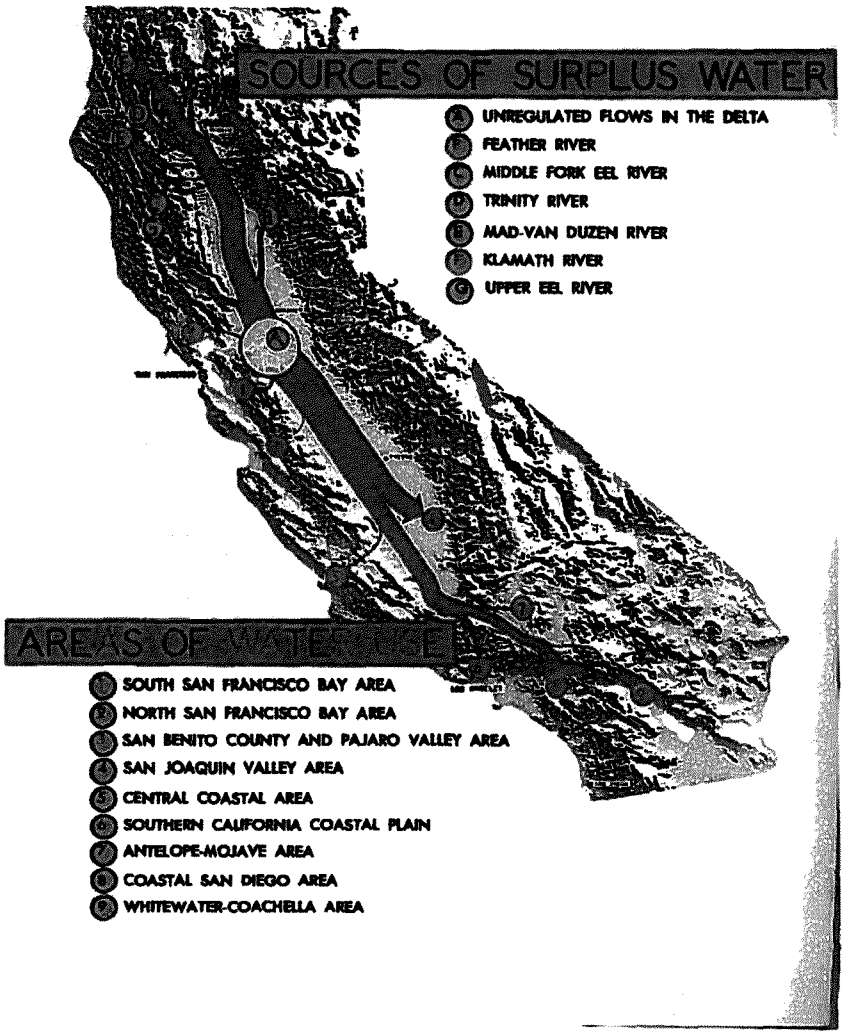
With the growing significance of recreation, the Delta has blossomed into a major recreation area at the doorsteps of metropolitan development in the San Francisco Bay area, Sacramento, and Stockton. In 1960, nearly 2,800,000 recreation-days were enjoyed in this boating wonderland.

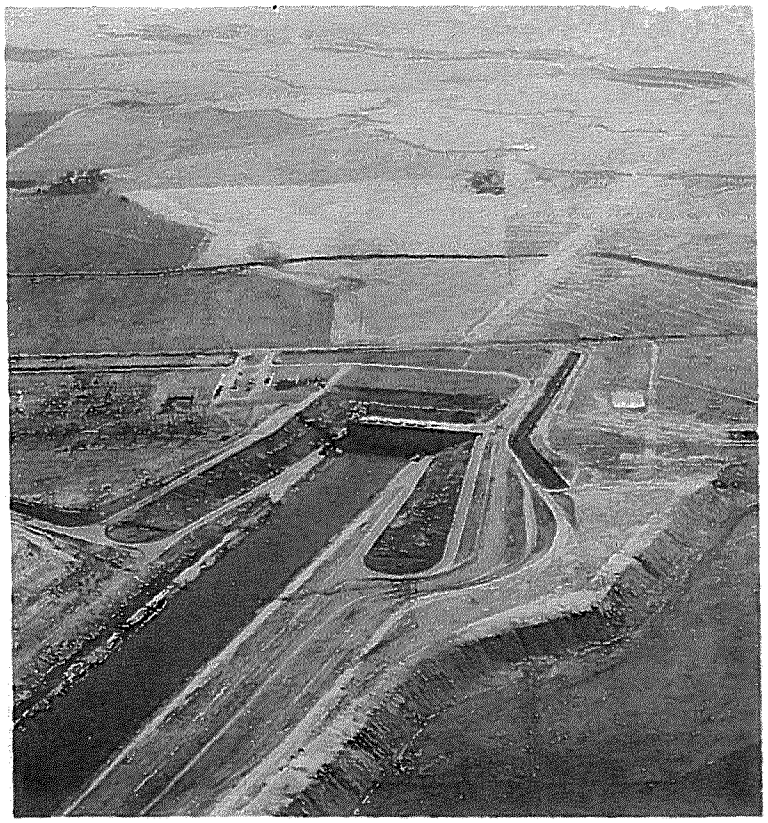
The Delta — its role in California's water development

In 1959, the State Legislature enacted the California Water Resources Development Bond Act to finance construction of the State Water Resources Development System. The bond act was approved by the California electorate in November 1960. The State Water Facilities, the initial features of this system, will complement continuing local and federal water development programs and include the very necessary works in the Delta.

One of the principal objectives of the State Water Resources Development System is to conserve water in areas of surplus in the north and to transport water to areas of deficiency to the south and west. The Delta is important in achieving this objective, since it receives all of the surplus flows of Central Valley rivers draining to the ocean during winter and spring months and is the last location where water not needed in the Delta or upstream therefrom can conveniently be controlled and diverted to beneficial use. Surplus water from the northern portion of the Central Valley and north coastal rivers will be conveyed by the natural river system to the Delta, where it must be transferred through Delta channels to export pumping plants without undue loss or deterioration in quality. Aqueducts will convey the water from the Delta to off-stream storage and use in areas of deficiency to the south and west.

In addition to being an important link in the interbasin transfer of water, the Delta is a significant segment of California's economy, and its agricultural, municipal, and industrial water supply problems, and flood control and related problems, must be remedied. A multipurpose system of Delta water facilities, which will comprise one portion of the State Water Resources Development System, is the most economical means of transferring water and solving Delta problems.

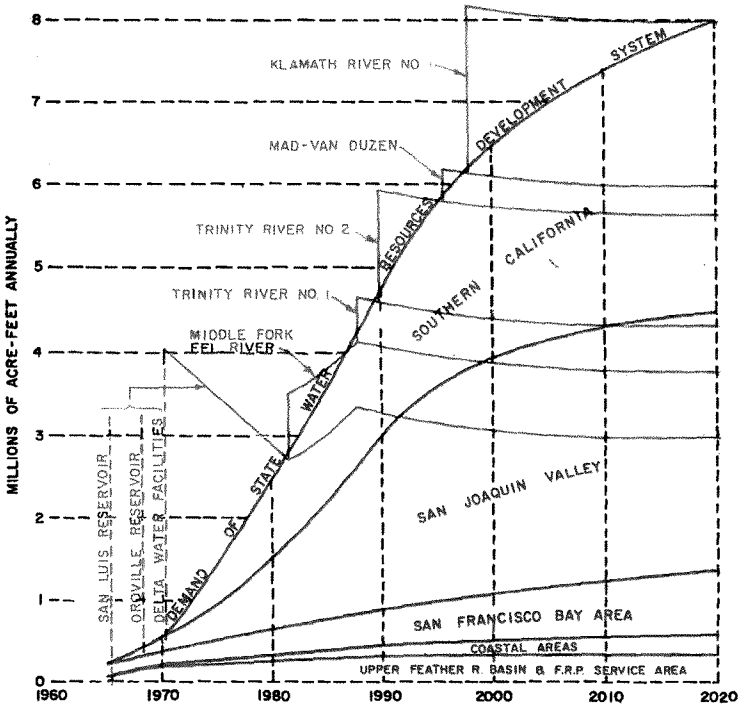




Tracy Pumping Plant

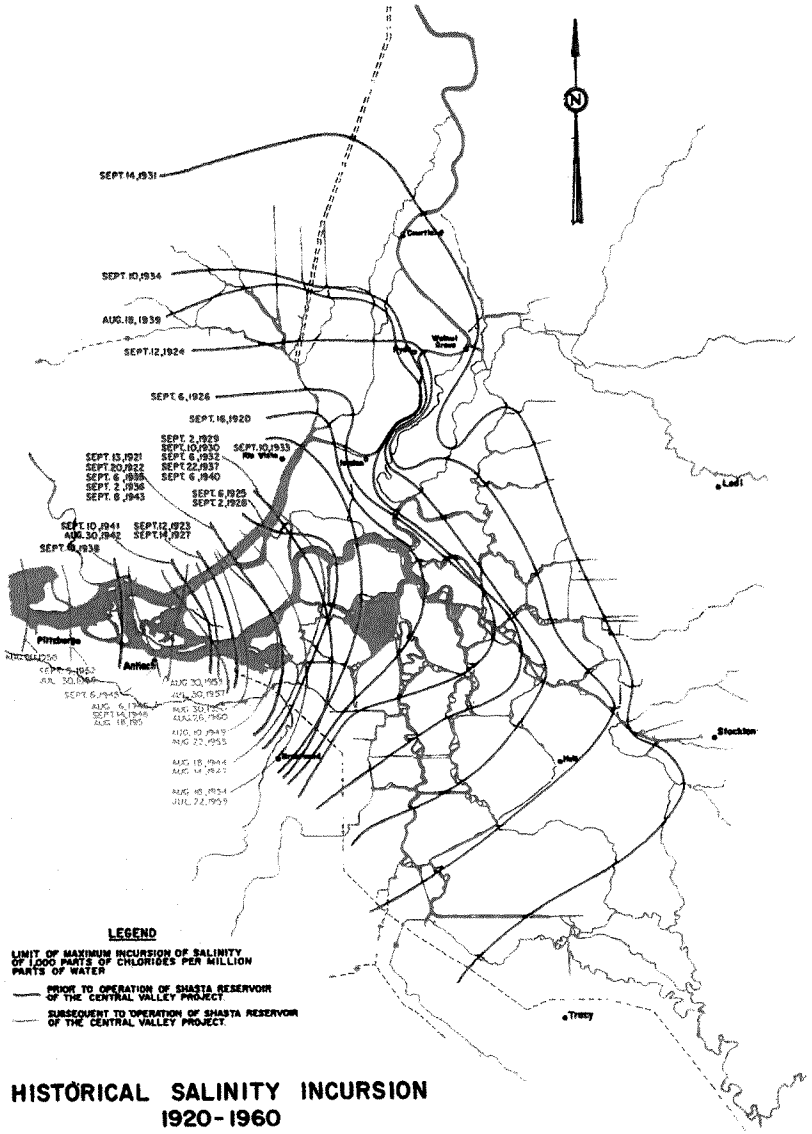
Full demands on the State Water Resources Development system can be met until about 1981 from surplus water in and tributary to the Delta with regulation by the proposed Oroville and San Luis Reservoirs. However, upstream depletions will reduce the available surplus supplies and water will have to be imported from north coastal sources after that year. It is anticipated that coordinated operation of the State Water Resources Development System and the Federal Central Valley Project will afford a limited increase in usable surplus Delta supplies beginning in 1981. As indicated in the chart, upstream depletions will continue to decrease the available surplus supplies.

The coordinated use of surplus water in and tributary to the Delta and of regulated or imported supplements to this supply, as required, is referred to as the Delta Pooling Concept. Under this concept of operation the State will ensure a continued supply of water adequate in quantity and quality to meet the needs of export water users. Advantage will be taken of surplus water available in the Delta, and as the demand for water increases and the available surplus supply is reduced by further upstream uses, the State will assume the responsibility of guaranteeing a firm supply of water, which will be accomplished by construction of additional storage facilities and import works. At the same time, the water needs of the Delta will be fully met.



WATER SOURCES AND USES

Delta Problems — salinity incursion and water supplies

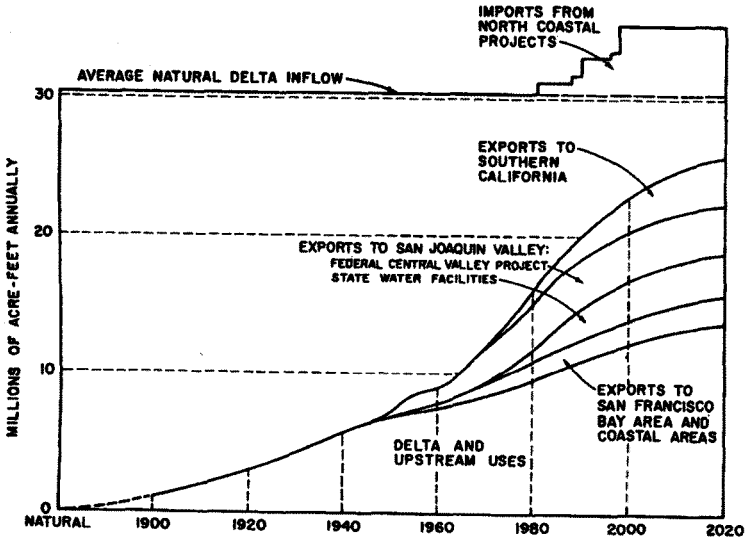


HISTORICAL SALINITY INCURSION
1920-1960

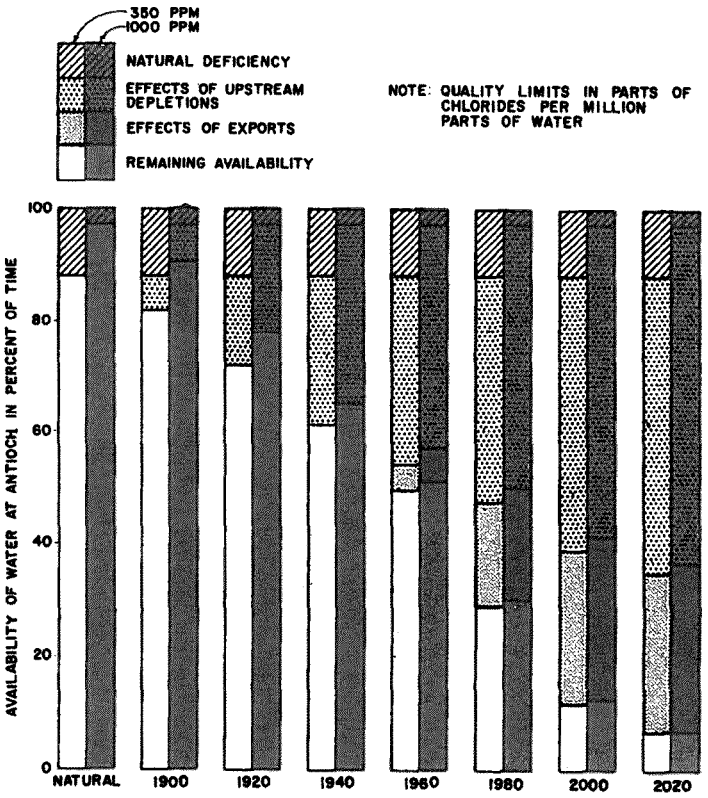
Salinity incursion into the Delta results from the flooding and ebbing of ocean tides through the San Francisco Bay and Delta system during periods when the fresh water outflow from the Delta is insufficient to repel the saline water. The natural fresh water outflow from the Central Valley was historically inadequate to repel salinity during summer months of some years. The first known record of salinity encroachment into the Delta was reported by Cmdr. Ringgold, U. S. Navy, in August 1841, whose party found the water at the site of the present city of Antioch very brackish and unfit for drinking. Since that time, and particularly after the turn of the century, with expanding upstream water use salinity incursion has become an increasingly greater problem in Delta water supplies. The maximum recorded extent of salinity incursion happened in 1931, when ocean salts reached Stockton. Since 1944 extensive incursion has been repulsed much of the time by fresh water releases from Central Valley Project storage in Shasta and Folsom Reservoirs. Without such releases, saline water would have spread through about 90 percent of the Delta channels in 1955 and 1959. Although upstream uses might not have reached present levels in the absence of the Central Valley Project, salinity problems would still have been very serious during most years.

Further increase in water use in areas tributary to the Delta will worsen the salinity incursion problem and complicate the already complex water rights situation. To maintain and expand the economy of the Delta, it will be necessary to provide an adequate supply of good quality water and protect the lands from the effects of salinity incursion. In 1959 the State Legislature directed that water shall not be diverted from the Delta for use elsewhere unless adequate supplies for the Delta are first provided.

The natural availability of good quality water in the Delta is directly related to the amount of surplus water which flows to the ocean. The graph to the right indicates the historic and projected availability of water in the San Joaquin River at Antioch containing less than 350 and 1,000 parts chlorides per million parts water, under long-term average runoff and *without* specific releases for salinity control. It may be noted that even under natural conditions, before any significant upstream water developments, there was a deficiency of water supplies within the specified quality limits. It is anticipated that, without salinity control releases, upstream depletions by the year 2020 will have reduced the availability of water containing less than 1,000 ppm chlorides by about 60 percent, and that exports will have caused an additional 30 percent reduction.



USE OF DELTA WATER SUPPLIES



DELTA WATER QUALITY WITHOUT SALINITY CONTROL

The magnitude of the past and anticipated future uses of water in areas tributary to the Delta, except the Tulare Lake Basin, is indicated in the diagram to the left. It may be noted that, while the present upstream use accounts for reduction of natural inflow to the Delta by almost 25 percent, upstream development during the next 60 years will deplete the inflow by an additional 20 percent. By that date about 22 percent of the natural water supply reaching the Delta will be exported to areas of deficiency by local, state, and federal projects. In addition, economical development of water supplies will necessitate importation of about 5,000,000 acre-feet of water seasonally to the Delta from north coastal streams for transfer to areas of deficiency.

Planning and Design Concepts

Planning for solutions to the complex Delta problems necessitates full recognition of the interrelated effects on all phases of the Delta's economy. The best solution should reflect the greatest overall benefits and least detriments, realizing that both objectives cannot be completely achieved when basic interests differ. Economies of construction and operation generally may be effected by multi-use of facilities. Therefore, consideration must be given to multipurpose development.

DELTA WATER SUPPLY

Water users in the Delta enjoy a naturally convenient source of supply in the numerous channels from which water is diverted by siphon or low-lift pumps. The supply problem in portions of the Delta stems from the poor quality of water, due to salinity incursion from the Bay and degradation by agricultural and industrial wastes. Adequate water supplies could be provided either by regulated releases of stored fresh water to repel salinity incursion and flush other wastes, or by constructing a physical barrier against salinity incursion and conveying unusable wastes beyond the barrier. A third alternative would involve a reduction of present salinity control in the western Delta channels and provision of substitute fresh water supplies to users who could not then divert from the channels containing brackish water. All three alternatives were evaluated, with particular attention to minimizing modifications to existing water supply systems.

The California Water Code specifies that one of the functions of the State Water Resources Development System is to provide salinity control and an adequate water supply in the Delta. If it is in the public interest to provide substitute supplies in lieu of salinity control, no added financial burden shall be placed on the local water users as a result of such substitution. The code also declares that water to which the Delta is entitled shall not be diverted. It is clearly established that supplying water for the Delta must be a primary and integral function of the State Water Facilities.

WATER SALVAGE

Unless physical works are constructed in the Delta, increasingly greater quantities of outflow will be required for quality control as more and more water is transferred across the Delta. However, most of the required outflow could be salvaged by constructing a physical barrier against salinity incursion, or by transferring the water more directly across the Delta to prevent commingling with brackish water near the outlet of the Delta.

The quality of water available for export, as well as for use in the Delta, must be suitable for various purposes. Standards for mineral quality, adopted by the Department of Water Resources and incorporated in water service contracts, permit not more than 400 parts of total dissolved solids and 100 parts of chlorides per million parts of water.

FLOOD AND SEEPAGE CONTROL

Flood stages in the Delta result from a combination of high tides, amplified by heavy winds on the ocean and Bay system, and inflow to the Delta. Historic inundations have generally resulted from levee failures, rather than overtopping. As the land behind the levees continues to subside, the stability of the levees decreases.

Physical and economic factors dictate an extended construction period for improvement of levees on organic soils. To reduce the extent and cost of levee improvements, it is prudent to limit flood waters to principal improved flood channels. Additional flood control reservoirs on rivers entering the Delta are contemplated for construction in the near future. Therefore, it is economical to design Delta flood channels for rates of flow anticipated after construction of upstream storage. Design of improved flood channels was predicated on additional

Attachment B

STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES

CONTRACT BETWEEN THE STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES AND THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA FOR A WATER SUPPLY

November 4, 1960

subdivision shall be inoperative to the extent that a contractor's annual entitlement for the respective year reflects established rights under the area of origin statutes precluding a reduction in deliveries to such contractor.

(b) In the event that the State is unable to construct sufficient additional conservation facilities to prevent a reduction in the minimum project yield, or if for any other reason there is a reduction in the minimum project yield, which, notwithstanding preventive or remedial measures taken or to be taken by the State, threatens a permanent shortage in the supply of project water to be made available to the contractors:

(1) The annual entitlements and the maximum annual entitlements of all contractors, except to the extent such entitlements may reflect established rights under the area of origin statutes, shall, by amendment of Table A included in Article 6(b), and of Article 7(b), respectively, be reduced proportionately by the State to the extent necessary so that the sum of the revised maximum annual entitlements of all contractors will then equal such reduced minimum project yield: Provided, That appropriate adjustment in the contractors' respective financial obligations to the State under the Transportation Charge shall be made in accordance with such reduced entitlements if such reductions have not been strictly proportionate throughout.

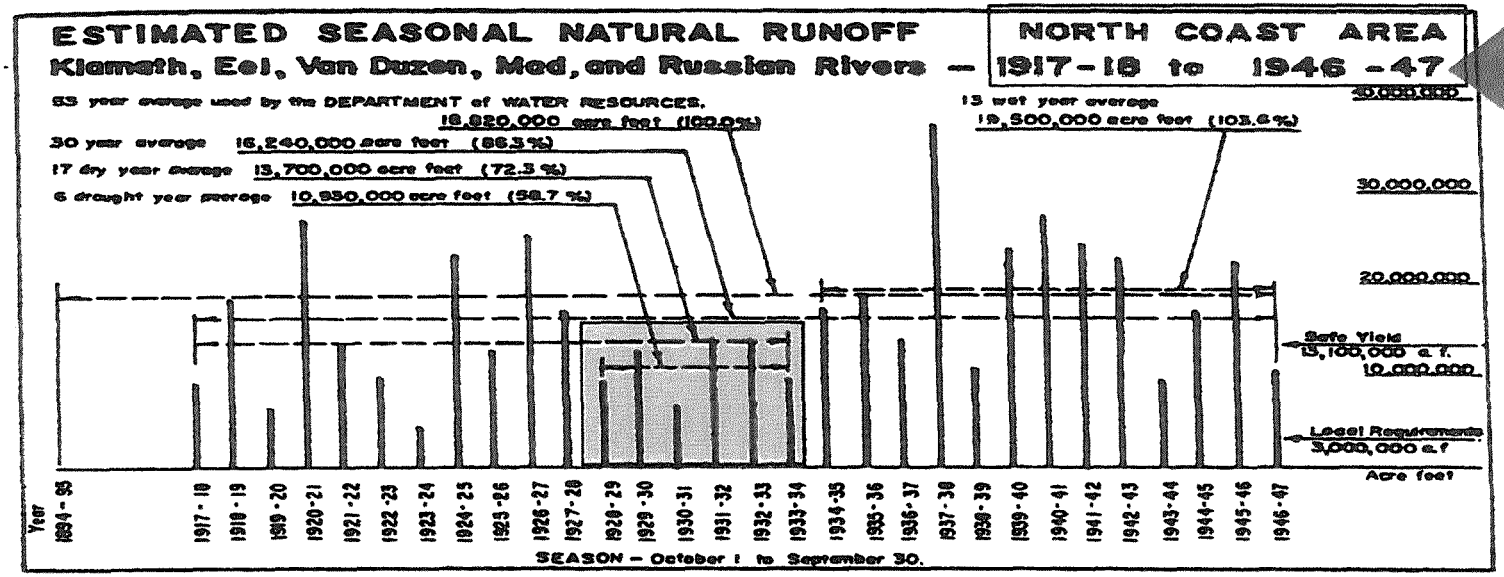
(2) The District, at its option, shall have the right to use any of the project transportation facilities which by reason of such reduction in the minimum project yield are not required for delivery of project water to the District, to transport

water procured by it from any other source: Provided, That such use shall be within the limits of the capacities provided in the project transportation facilities for service to the District under this contract: Provided further, That except to the extent such limitation in Section 12931 of the Water Code be changed, the District shall not use the project transportation facilities under this option to transport water the right to which was secured by the District through eminent domain unless such use be approved by the Legislature by concurrent resolution with a majority of the members elected to each house voting in favor thereof.

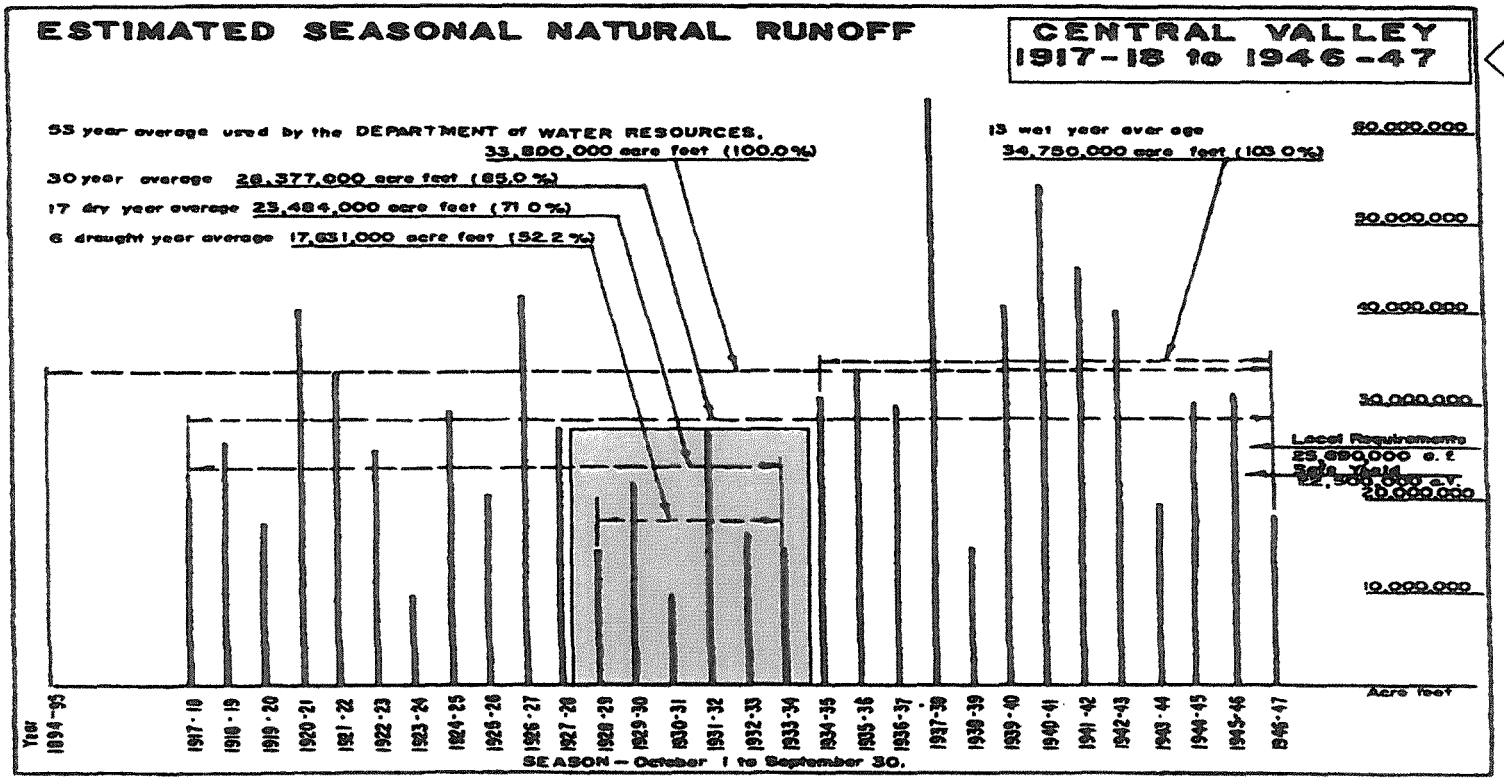
(c) In the event that the State, because of the establishment by a party of a prior right to water under the provisions of Sections 11460 through 11463 of the Water Code, enters into a contract with such party for a dependable supply of project water, which contract will cause a permanent shortage in the supply of project water to be made available to the District hereunder:

(1) The State shall: (i) equitably redistribute the costs of all transportation facilities included in the System among all contractors for project water, taking into account the diminution of the supply to the District and other prior contractors and the payments theretofore made by the District and other prior contractors in accordance with the terms of their contracts, and (ii) revise the District's annual entitlements and maximum annual entitlement, by amendment of Table A included in Article 6(b) and of Article 7(b), respectively, to correspond to the reduced supply of project water to be made available to the District: Provided, That such redistribution of costs of transportation facilities shall not be made until there has been reasonable

WEBER FOUNDATION STUDIES



Surplus
7,930,000 AF/ YR



SHORTAGE
8,049,000 AF/Y

Attachment C

CALIFORNIA SUPERIOR COURT

CITY AND COUNTY OF SAN FRANCISCO

DEPARTMENT NUMBER SEVENTEEN

UNITED STATES OF AMERICA,

Petitioner,

vs.

STATE WATER RESOURCES CONTROL BOARD,

Respondent.

DELTA WATER CASES

Nos. 759239, 759266, 759540, 759547, 759558, 759586, 759240, & 759611

JUDICIAL COUNCIL COORDINATION PROCEEDING NO. 548

STATEMENT OF DECISION

I. INTRODUCTION

The Sacramento-San Joaquin Delta is the hub of two massive water projects that extend nearly the full length of California. One is run by the U.S. Bureau of Reclamation, the other by the California Department of Water Resources. The projects store water in reservoirs, release it into rivers that flow into the Delta, and pump it south from the Delta. The water pumped south is used by farmers and municipalities in the Central Valley and southern California. The water not pumped is used by Delta

12203 is best construed as dealing with the water to which Delta users are entitled under either their riparian or appropriative rights or rights under the Watershed of Origin statutes that have been properly perfected. 42/

In summary, this court concludes the following. The Delta Protection Act creates an inchoate prior right to an "adequate water supply" in favor of Delta users. The water supply can only be adequate if salinity intrusion is controlled. The right comprises water for direct use and for controlling salinity intrusion. In order to perfect a right to water in excess of that to which they are entitled under appropriative and riparian rights, Delta users must obtain an appropriative permit 43/ and execute a repayment contract. Because the inchoate rights of Delta users have not been perfected, the Board did not err by setting water quality standards that did not reflect the enhanced water quality anticipated by the act. Of course, if any such rights are perfected, the Board will be obligated to protect them.

3. Repayment Contracts

The Delta petitioners argue that they need not pay for water released, pursuant to the Delta Protection Act, for salinity control purposes. However, this court holds that Delta users must pay for water provided under either the Watershed of Origin statute or the Delta Protection Act, regardless of whether the water is used directly by Delta users or to repel saltwater intrusion. This court further holds that repayment contracts must be executed before the projects can be

required to provide water the projects have developed.

The parties agree that water put to direct use in the Delta must be paid for if it is made available by the projects, i.e., if water has been stored during periods of high flow and released during periods of low flow specifically for a user's benefit. However, the parties disagree about whether users must pay for water released for salinity control. The Delta petitioners point out that there is no express payment requirement in the section of the Delta Protection Act that governs the provision of salinity control (Wat. Code sec. 12202), or in any other section of that act. However, a payment requirement appears in the Watershed of Origin statute (Wat. Code sec. 11462), which is incorporated into the Delta Protection Act (Wat. Code sec. 12201). 44/ Therefore, this court concludes that salinity control water made available under the Watershed of Origin statute or the Delta Protection Act specifically for a Delta user's benefit must be paid for by that user.

However, Delta users need not pay for salinity control water even if they are incidentally benefited unless the water is released specifically for their benefit. Delta users need not pay for these incidental benefits because the water would be released anyway. 45/ Three instances follow.

First, Delta water users need not pay for the enhanced water quality that results from water released by the projects to maintain adequate water quality at the export pumping stations; this water has been alternatively characterized as salinity control water, delivery water, or carriage water.

Because the contracts between the project operators and their export contractors provide for water of a specific water quality, this salinity control water is furnished as part of the quid pro quo of the contracts. Therefore, the costs should be borne by those who have entered into such contracts. Similarly, the export contractors should bear the full cost of any enhanced water quality that results from the release of water that is actually delivered to them.

Second, Delta users need not pay for the enhanced water quality resulting from the release of abandoned water. Abandoned water may include irrigation return flows, water used to generate electricity, and water released from reservoirs to create sufficient storage capacity to capture subsequent floodwaters. These releases of water are already paid for. Water released for improving navigation, which may not actually be abandoned, also has been paid for and, therefore, need not be paid for by Delta users.

Third, Delta users need not pay for the enhanced water quality resulting from water released to preserve or enhance fish and wildlife resources. Nowhere in Water Code section 1243, which empowers the Board to protect and enhance fish and wildlife when acting upon permits, is there any indication that anyone would have to pay for this protection. Any benefit the Delta users receive by virtue of their location in a protected area is incidental and need not be paid for. Furthermore, the Davis-Dolwig Act provides for payment for water used to preserve and enhance fish and wildlife: Water Code section 11912 provides that state contractors are to bear the cost of

fish and wildlife preservation and sections 11913 and 11900 provide that expenses for fish and wildlife enhancement are to be borne by the state's General Fund. 46/

In summary, Delta users must pay for water made available by the projects under the Watershed of Origin statute or the Delta Protection Act specifically for their use, but they need not pay for incidental benefits from water released for other purposes.

Whether a repayment contract must be executed to perfect a right to water under the Watershed of Origin statute or the Delta Protection Act is an issue that must now be addressed. There are no provisions explicitly requiring contracts within either the Delta Protection Act or the Watershed of Origin statute. However, the statutes governing the operation of the two projects require contracts before water is provided.

Federal reclamation law requires contracts when a reclamation project provides water for irrigation use (43 U.S.C. sec. 423e, sec. 485h, subds. (d)-(e)), and for municipal or other uses (43 U.S.C. sec. 521, sec. 485h, subd. (c)). 47/ Contracts must be executed prior to the delivery of water. (43 U.S.C. secs. 423e, 521, sec. 485h, subd. (h).) State law requires contracts when the state project provides water for users. (Wat. Code secs. 12937, 12931 (incorporating Wat. Code secs. 11455, 11625).) Although the state sections apparently do not require that contracts be executed prior to the delivery of water, the state project permits before the Board in D. 1485 all contain a term that requires the prior execution of contracts for water delivery in the Sacramento

River watershed and the Delta. 48/

Requiring contracts to be executed before providing water under the Watershed of Origin statute of the Delta Protection Act poses certain complications. First, fish and wildlife obviously lack the capacity to contract. Because provision has been made in the Davis-Dolwig Act for payment for water used to preserve or enhance fish and wildlife, there is no reason that contracts should be required for water used for this purpose.

Second, the Delta petitioners argue that a satisfactory contract for salinity control water could not be executed because it is impossible to determine in advance the exact amount of water required to be released for this purpose. Obviously, this is due to fluctuations in precipitation and uncertainty as to actual future water quality conditions. However, satisfactory contracts can be executed. One solution could be a carefully negotiated contract in which the contracting project would agree to release sufficient water to ensure the predetermined water quality in return for annual payment of the average annual cost of providing such water.

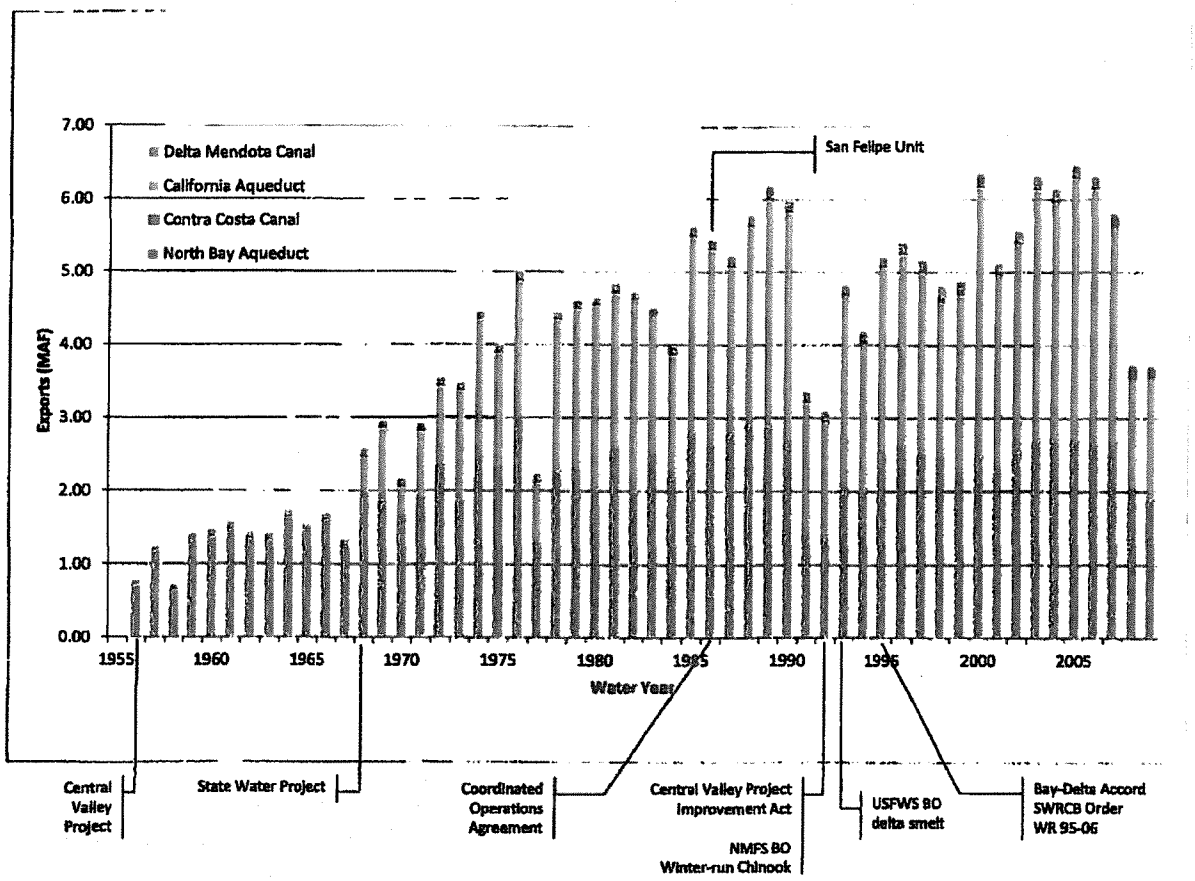
The amount of water that would need to be released specifically for the contractor in excess of water released for other purposes could be calculated with reference to long-term historical records of Delta inflow using sophisticated models developed by the projects. Such a contract has already been executed by the North Delta Water Agency. (See The Cal. State Water Project--Current Activities and Future Management Plans, Dept. Water Resources Bull. No. 132-81 (Nov. 1981) pp. 70-71.

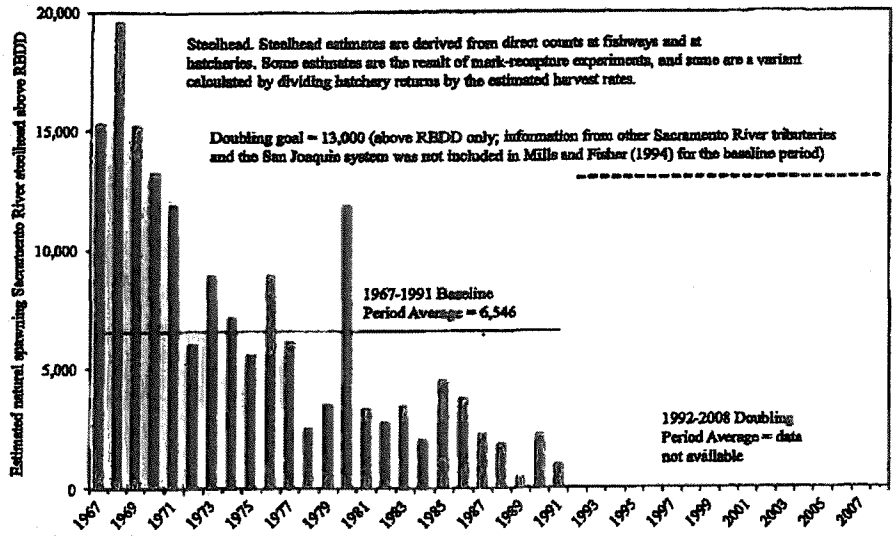
In summary, contracts are required prior to the delivery of water under the Watershed of Origin statute or the Delta Protection Act -- whether for direct use or for salinity control. Because no one has contracted for enhanced water quality under these statutes, the Board need not have established water quality standards to protect Delta users' inchoate rights under these statutes.

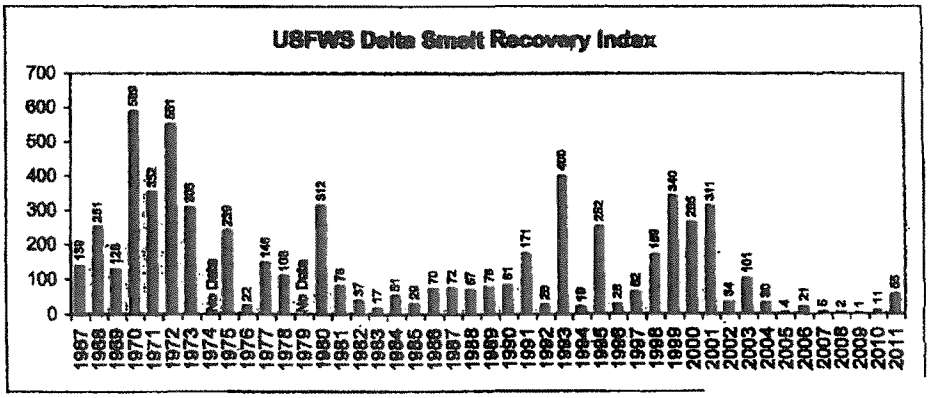
E. Protection of Fish and Wildlife

Beneficial uses, as defined by the Porter-Cologne Act, include "preservation and enhancement of fish, wildlife, and other aquatic resources." (Wat. Code sec. 13050(f).) To protect fish and wildlife in the Delta, the Board set water quality standards designed to ensure that a sufficient amount of freshwater flows out of the Delta and into San Francisco Bay. (Plan, pp. VI-31 to VI-33; Decision, pp. 38-39.) The abundance of fish in the Delta apparently depends on the magnitude of the freshwater outflow and of the saltwater intrusion. (See Plan, p. III-3.)

Fish do not have water rights, and two California Courts of Appeal have held that one cannot obtain an appropriative permit to protect fish. (California Trout, Inc. v. State Water Resources Control Board (1979) 90 Cal.App.3d 816, 820; Fullerton v. State Water Resources Control Board (1979) 90 Cal.App.3d 590, 603.) However, as explained below, the Board has powers that enable it to protect fish. If it properly employs these powers, the Board can prevent water users from taking the water allocated to fish. It can also establish


Delta Mendota Canal
California Aqueduct
Contra Costa Canal
North Bay Aqueduct
San Felipe Unit
Exports (MAF)
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
Water Year
Central Valley Project
State Water Project
Coordinated Operations Agreement
Central Valley Project Improvement Act
NMFS BO Winter-run Chinook
USFWS BO delta smelt
Bay-Delta Accord SWRCB Order WR 95-06


Steelhead. Steelhead estimates are derived from direct counts at fishways and at hatcheries. Some estimates are the result of mark-recapture experiments, and some are a variant calculated by dividing hatchery returns by the estimated harvest rates.
Doubling goal = 13,000 (above RBDD only; information from other Sacramento River tributaries and the San Joaquin system was not included in Mills and Fisher (1994) for the baseline period)
1967-1991 Baseline Period Average = 6,546
1992-2008 Doubling Period Average = data not available
Estimated natural spawning Sacramento River steelhead above RBDD
20,000
15,000
10,000
5,000
0


USFWS Delta Smelt Recovery Index
700
600
500
400
300
200
100
0

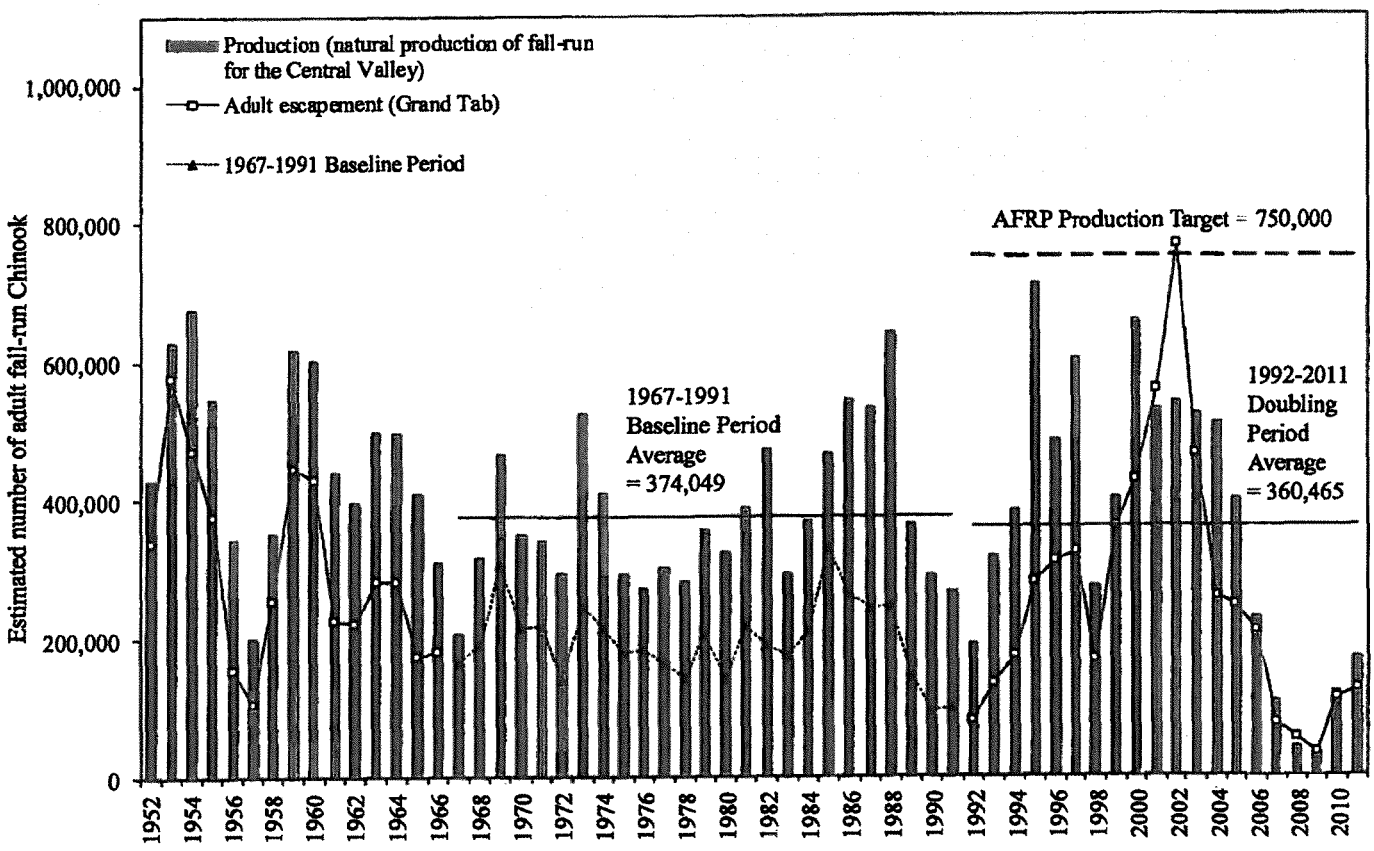


Figure 2. Estimated yearly natural production and in-river escapement of adult fall-run Chinook salmon in the Central Valley rivers and streams. 1952 - 1966 and 1992 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

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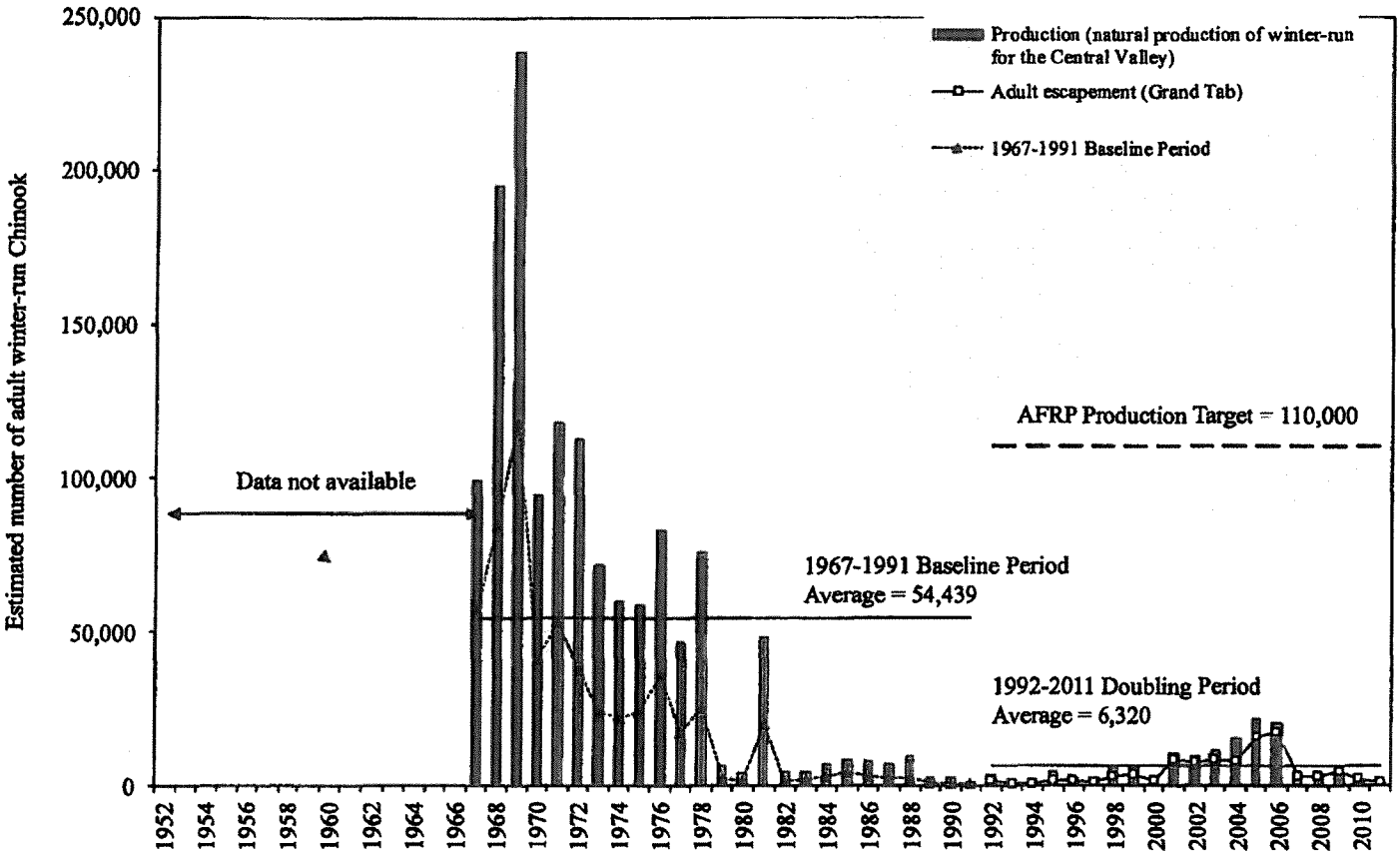
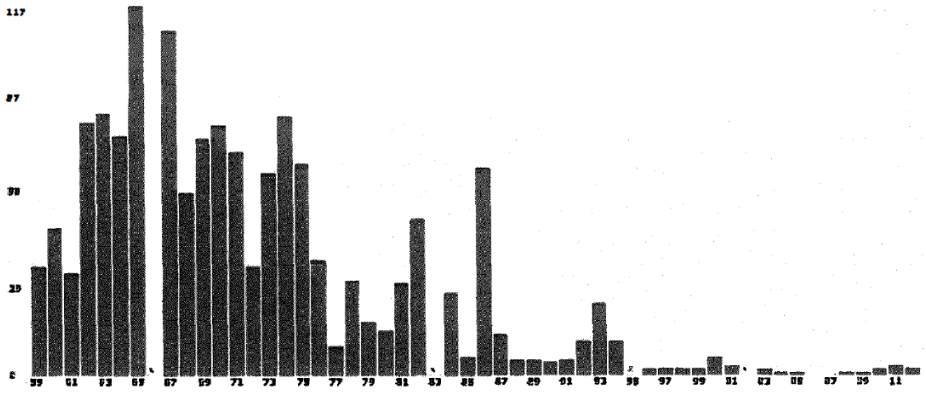


Figure 4. Estimated yearly adult natural production, and in river adult escapements of winter-run Chinook salmon in the Central Valley rivers and streams. 1992 - 2011 numbers are from CDFG Grand Tab (Apr 24, 2012). 1967-1991 Baseline Period numbers are from Mills and Fisher (CDFG, 1994).

Attachment H - 9/24/2013

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE

Striped Bass Indices



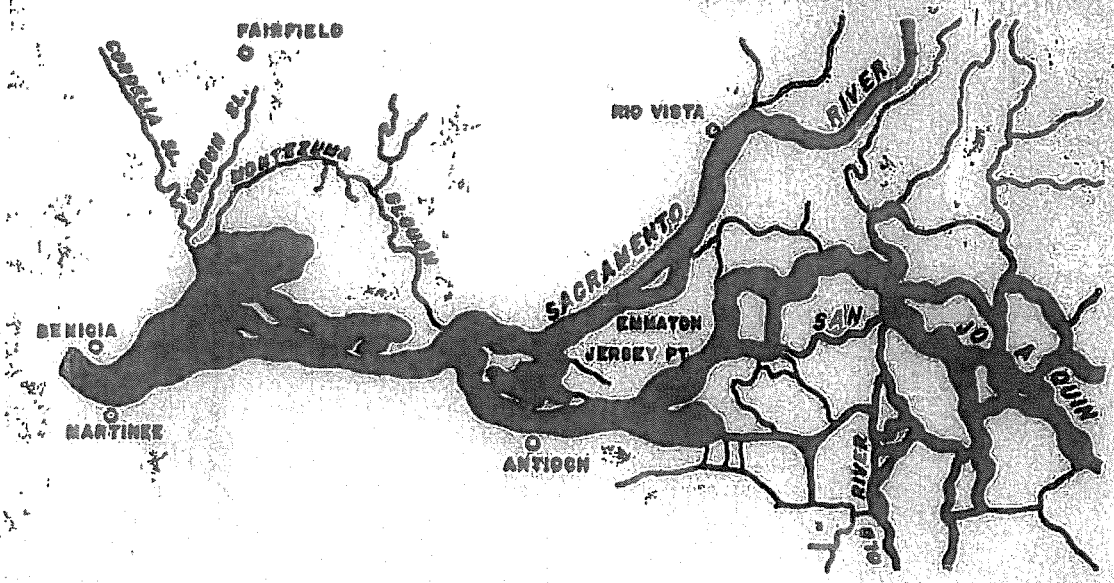
Year	Index Date	Delta Index	Suisun Bay Index	Total Index
1959	12 Jul	30.7	3.0	33.7
1960	16 Jul	32.0	13.6	45.6
1961	21 Jul	25.2	6.4	31.6
1962	26 Jul	46.8	32.1	78.9
1963	3 Aug	38.2	43.5	81.7
1964	1 Aug	54.7	20.7	75.4

Water Right Decision 1485

In the Matter of Permit 12720 (Application 5625) and Other Permits of United States Bureau of Reclamation for the Federal Central Valley Project and of California Department of Water Resources for the State Water Project.

DECISION IN FURTHERANCE OF JURISDICTION RESERVED IN DECISIONS D 893, D 990, D 1020, D 1250, D 1275, D 1291, D 1356, D 1358, and PERMIT ORDER 124

Sacramento-San Joaquin Delta and Suisun Marsh



August 1978

STATE WATER RESOURCES CONTROL BOARD

Attachment I

executed. The criteria in the draft agreement were recommended by Fish and Game and endorsed by the Department, and were extensively analyzed by the Board staff. Based on our most current assessment, the fishery standards provide significantly higher protection than existing basin plans. The Striped Bass Index is a measure of young bass survival through their first summer. The Striped Bass Index would be 71 under without project conditions (i.e., theoretical conditions which would exist today in the De1ta and Marsh in the absence of the CVP and SWP). 63 under the existing basin p1ans, and about 79[3] under this decision.

While the standards in this decision approach without project levels of protection for striped bass, there are many other species, such as white catfish, shad and salmon, which would not

D 1485 1978, No Shutdown instead increased export

be protected to this level. To provide full mitigation of project impacts on all fishery species now would require the virtual shutting down of the project export pumps. The level of pro-

End of special text

tection provided under this decision is nonetheless a reasonable level of protection until final determinations are made concerning a cross-Delta transfer facility or other means to mitigate project impacts.

---

[3] There is some indication that factors other than those considered in the Board's analysis of without project levels may also affect striped bass survival. The effects of these factors are such that the without project levels would be greater that 71. However, the magnitude of this impact is unknown and cannot be quantified at this time.

The following text not provided:

Suisun Marsh. Full protection of Suisun Marsh now could be accomplished only by requiring up to 2 million acre-feet of freshwater outflow in dry and critical years in addition to that required to meet other standards. This requirement would result

Ends text not provided

in a one-third reduction in combined firm exportable yield of State and federal projects. In theory, the existing Basin 5B Plan purports to provide full protection to the Marsh. However, during the 1976-77 drought when the basin plan was in effect, the Marsh received little if any protection because the system almost ran out of water and emergency regulations had to be imposed. This decision balances the limitations of available water supplies against the mitigation responsibility of the projects. This balance is based on the constitutional mandate "...that the water resources of the State be put to beneficial use to the fullest extend of which they are capable..." and that unreasonable use and unreasonable diversion be prevented (Article 10, Section 2, California Constitution).

The Bureau, the Department, Fish and Game, and U.S. Fish and Wildlife Service are working together to develop alternative water supplies for the Marsh. Such alternative supplies appear to represent a feasible and reasonable method for protection of the marsh and mitigation of the adverse impacts of the projects. Under this decision the Department and Bureau are required, in cooperation with other agencies, to develop a plan for Suisun Marsh by July 1, 1979. The Suisun Marsh plan should ensure that the

Jeff Opperman
Final Report for Fellowship R/SF-4

My CALFED fellowship (R/SF-4) had three primary research areas: (1) how native fish use California floodplains; (2) developing a method to identify and quantify a particular type of floodplain in the Sacramento Valley; and (3) a white paper for CALFED that reviews, summarizes, and synthesizes research on floodplains generally, and Central Valley floodplains specifically.

1. Native fish and floodplains.

For this research I collaborated with Carson Jeffres, a graduate student at UC Davis (this research was his Master's thesis). We compared the growth rates of juvenile Chinook salmon between various floodplain and riverine habitats. This study built on previous work; (1) in the Yolo Bypass that found that juvenile Chinook grew faster in the flooded Bypass than in the nearby Sacramento River and; (2) in the Cosumnes Preserve which showed that native, wild juvenile Chinook salmon appeared to use the Cosumnes floodplain for rearing when it was inundated.

Juvenile salmon were obtained from a hatchery on the Mokelumne River and placed in enclosures within the Cosumnes River and floodplain (ten fish per enclosure). For two flood seasons (2004 and 2005), six enclosures were placed in each of three different habitat types in the floodplain and two locations in the river (30 enclosures total). Floodplain habitats included an ephemeral pond, flooded terrestrial herbaceous vegetation, and a pond that was permanent during the first year of the study and ephemeral during the second. The river locations were the river channel above the floodplain and the river channel below the floodplain.

The fish were measured at one week intervals, although measurement frequency declined during large flood events that made access difficult. In 2004 fish were measured three times over 4.5 weeks and in 2005 they were measured four times over 8 weeks. After the final measurement the fish were sacrificed and a sub-set were saved for a gut-content analysis.

In general, fish had faster growth rates in floodplain habitats than in the river. During periods of low, clear water, fish growth rates in the river site above the floodplain were comparable to those in the floodplain. However, during higher flows, with more turbid water, growth in the river above the floodplain was significantly lower than on the floodplain. Fish in the river below the floodplain, which was representative of intertidal delta habitat, were consistently low.

The main channel of the Cosumnes River, like those of many Central Valley rivers, is incised and lacks complexity. There are few side channels, backwaters, or accessible floodplain habitats (other than the Cosumnes Preserve). Thus, juvenile fish will tend to be displaced downstream during high flow events. In the Cosumnes, juvenile fish will be flushed downstream to either the intertidal delta or the floodplain. Among these two

habitats, the floodplain appears to provide significantly better habitat for rearing (Figure 1).

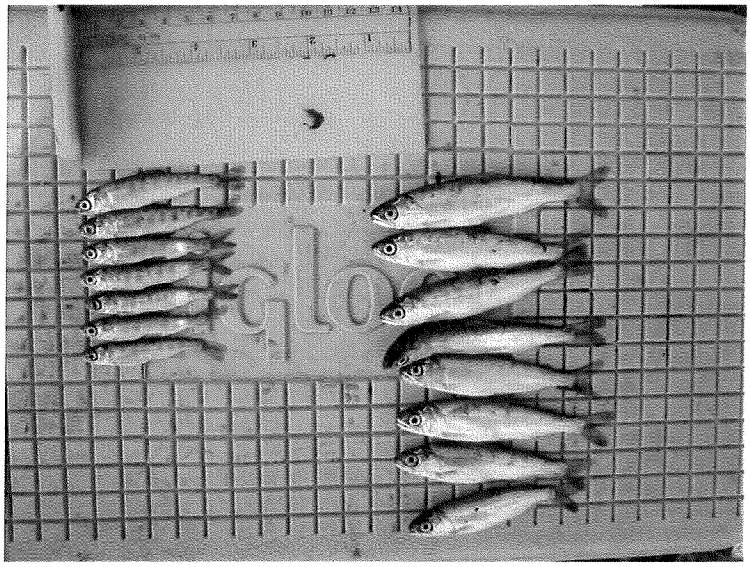


Figure 1. Juvenile Chinook on the right were reared within an enclosure within the Cosumnes River floodplain while those on the left were reared within an enclosure in the river below the floodplain (intertidal Delta habitat).

This study confirms that juvenile Chinook benefit from access to floodplain habitats. While river habitats comparable to those above the floodplain can support similar growth rates as the floodplain, this habitat is more variable. During high flows the river offers poor habitat and fish living in this type of habitat will tend to be displaced downstream. The floodplain can provide optimal growing conditions during such floods and likely offers superior habitat conditions to the downstream Delta.

The risk of fish stranding on the floodplain merits further research. However, initial research on the Cosumnes suggests that native fish tend to respond to cues that facilitate emigration from the floodplain during draining and that primarily non-native fish become stranded. This work further supports the concept that floodplain restoration can be an important strategy for restoring Central Valley salmon populations.

This research is summarized in:

Jeffres, C., J. Opperman, and P. B. Moyle. *Submitted.* Ephemeral floodplain habitats provide best growth conditions for juvenile Chinook salmon in a California river. Submitted to Environmental Biology of Fishes.

This work has also been presented at the following conferences:

1. Floodplain Management Association 2005
2. Society for Ecological Restoration 2005
3. Riverine Hydroecology (Stirling, Scotland) 2006

2. Identifying and mapping the floodplain inundated by the Floodplain Activation Flood.

Working in collaboration with Phil Williams and Associates (PWA), we worked to define, identify, and quantify a particular type of floodplain: that which is inundated by a Floodplain Activation Flood (FAF). The FAF is a relatively frequent, long duration, spring-time flood that has particular value for native fish and food web productivity (see text on floodplain conceptual model below for further description of a Floodplain Activation Flood).

The FAF was defined as follows:

1. occurs in two out of three years (67% exceedance probability)
2. duration of at least one week
3. occurs between March 15 and May 15.

These criteria were applied to a series of paired gauges along the Sacramento River and within the Yolo Bypass. This process derived a flood stage elevation that corresponded to the FAF criteria. This flood stage was then used to develop a water surface that was applied to topography for the Sacramento River and surrounding floodplain (from US Army Corps of Engineers' Sacramento-San Joaquin Comprehensive Study), estimating the area of floodplain inundated during the FAF.

We found that there is very little floodplain area inundated by the FAF in the current Sacramento Valley. Nearly all floodplain that corresponds to the FAF is found within the Yolo Bypass.

This work is further described in:

Philip Williams & Associates, L., and J. J. Opperman. 2006. The frequently activated floodplain: quantifying a remnant landcape in the Sacramento Valley, San Francisco, CA.

Williams, P., J. Opperman, E. Andrews, S. Bozkurt, and P. Moyle. Quantifying activated floodplain on a lowland regulated river. *In preparation for* San Francisco Estuary and Watershed Science.

3. The Central Valley Floodplain White Paper

I am continuing to work on the floodplain white paper along with my co-author, Peter Moyle. A central part of the white paper is a conceptual model for Central Valley floodplains, briefly described below.

This work has been presented at the following conferences:

1. Floodplain Management Association, 2005
2. American Geophysical Union and the North American Benthological Society, 2005
3. Society for Ecological Restoration, 2005

4. State of the Estuary Conference, 2005
5. CALFED Science Conference, 2006
6. Riverine Hydroecology (Stirling, Scotland), 2006
7. State of Washington, the Ecological Value of High Flows, 2006

Brief overview of conceptual model:

Floodplains support high levels of biodiversity and are among the most productive ecosystems in the world. They provide a range of ecosystem services to human society, including storage and conveyance of flood flows, groundwater recharge, open space, recreational opportunities, and habitat for a diversity of species, many of them of economic importance. Among the world's ecosystem types, Costanza et al. (1997) ranked floodplains second only to estuaries in terms of the ecosystem services provided to society. In the Central Valley, the most important ecosystem services provided by floodplains include reduction of flood risk and habitat for numerous species, including commercially and recreationally valuable species (e.g., chinook salmon and waterfowl) and for endangered species. Recent research has demonstrated that floodplains provide necessary spawning habitat for the Sacramento splittail, an endemic minnow (Sommer et al. 1997) and that juvenile chinook salmon grow faster on floodplains than in main-stem river channels (Sommer et al. 2001b) (Figure 1). Productivity from floodplains can be exported to the Sacramento-San Joaquin Delta, where food limitation is likely one of the factors contributing to the decline of fish species (Jassby and Cloern 2000, Schemel et al. 2004). Further, in places such as the Yolo Bypass, ecologically valuable floodplains can be compatible with productive agriculture (Sommer et al. 2001a).

Recognizing these valuable services, state and federal agencies have expressed policy goals to restore floodplains in the Central Valley (CALFED Bay-Delta Program 2000). Further, flood management projects in the Central Valley now generally include a floodplain restoration component. To guide these restoration efforts, we convened a floodplain working group, composed of floodplain experts drawn from academia, agencies, NGOs, and the private sector, to define ecologically functional floodplains. This group described three primary components of ecologically functional floodplains:

- ***Connectivity*** between river and floodplain.
- ***Hydrological variability***
- ***Sufficient geographic scale*** for associated ecological benefits to be meaningful on a system- or population-scale.

We developed a conceptual model of floodplain processes based on the scientific literature, our collective experiences studying floodplains, and guidance from the floodplain working group (Figure 2). This conceptual model illustrates the linkages between physical and biological processes in floodplains and can be used to inform floodplain restoration projects.

Organization of the conceptual model.
A diverse range of flows influence floodplain geomorphic and ecological processes, ranging from flows below bankfull to large, rare, and highly erosive floods. Numerous aspects of these flows have geomorphic and ecological significance, including magnitude, frequency, duration, rates of change, and seasonality, as well as antecedent conditions on the floodplain. To simplify, our conceptual model focuses on three types of 'representative floods,' characterized by their frequency and magnitude, which are found in the blue boxes in the Hydrology portion of the model. These floods perform geomorphic work, described in the brown-outline boxes in the Geomorphology portion of the model. Hydrologic and geomorphic processes create the conditions for Ecosystem Responses and Processes to occur (green-outlined boxes). The Ecosystem Responses and Processes produce Ecological Benefits, the magnitudes of which are influenced by the geographic scale of floodplain. Two representative floods, the Floodplain Activation Flood and the Floodplain Reorganization Flood are illustrated in Figures 2 and 3 and described below.

Two representative floods
Floodplain Activation Flood. The floodplain activation flood (FAF) is a small-magnitude flood that occurs relatively frequently (e.g., almost every year) (Figure 3). The FAF can be further defined in terms of seasonality and duration—for example a flood that lasts at least one week and occurs in the Spring. The following article by Betty Andrews defines a FAF in terms of frequency, season, and duration and then describes a process to map the floodplain that corresponds to the FAF in the Sacramento Valley. A long duration flood produces characteristic ecological benefits such as habitat for native fish spawning and rearing (Figure 1) and food web productivity. The duration of the flood is important as these processes cannot occur during a short event. The seasonality of the flood also influences which ecological processes occur (see the temporal scale bar (Winter Late spring) in one of the ecological process boxes). The importance of duration and seasonality for a FAF is indicated by the question mark adjacent to the flood occurring in late January on the hydrograph in Figure 2 (a short, winter-time flood). Because floodplains can remain inundated for a period of time after the loss of direct connection with river flows, a series of short connections can also function as a floodplain activation flood.
Floodplain Reorganization Flood. The floodplain reorganization flood is a greater magnitude flood that occurs less frequently (Figure 3). This higher energy flood produces geomorphic work including extensive erosion and deposition on the floodplain which creates heterogeneous floodplain topography. In turn, these dynamic events and heterogeneous topography create a diverse ecosystem with vegetation patches of varying age, species composition and structure, and floodplain water bodies of varying successional stage and connectivity to the river. The ecosystem processes that occur during a Floodplain Activation Flood take place within the mosaic of habitat features created during Floodplain Reorganization Floods.

Conclusions
The model illustrates the importance of hydrological variability for an ecologically functional floodplain. For example, a floodplain that rarely is inundated by a Floodplain

Activation Flood will not produce the ecological benefits of food web productivity or spawning and rearing habitat for native fish. A floodplain that is not subject to Floodplain Reorganization Floods will not maintain the mosaic of habitats (e.g., vegetation and water bodies of varying successional stages) that help support floodplain biodiversity. Therefore, floodplain restoration projects should not only focus on reintroducing connectivity between rivers and floodplains. Floodplain managers should also ask the following questions about this connectivity: how often, for how long, in what season, and of what magnitude? The answers to these questions will strongly influence the range of ecological benefits that the restored floodplain can provide.

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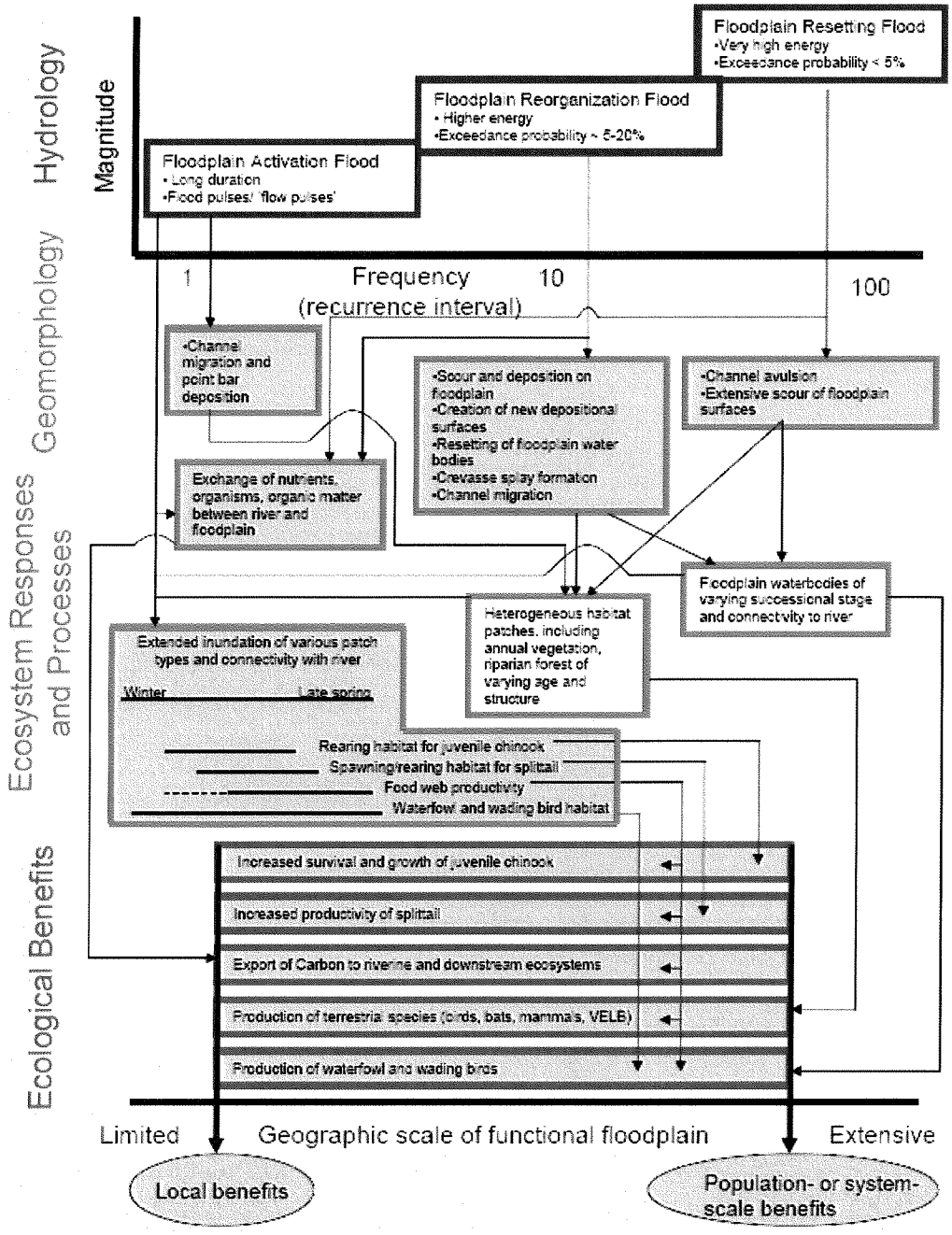
Figure 2. Floodplain Conceptual Model



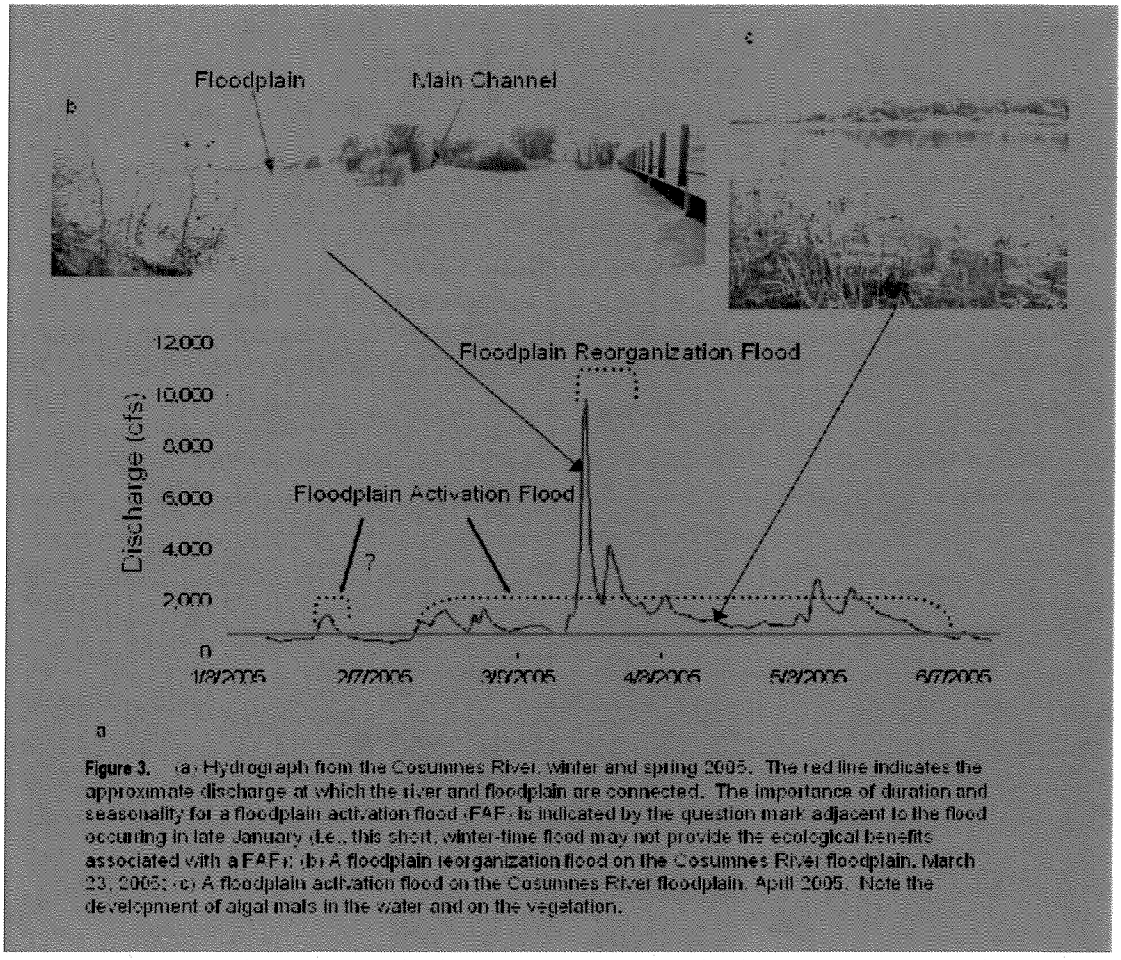


Figure 3. (a) Hydrograph from the Cosumnes River, winter and spring 2005. The red line indicates the approximate discharge at which the river and floodplain are connected. The importance of duration and seasonality for a floodplain activation flood (FAF) is indicated by the question mark adjacent to the flood occurring in late January (i.e., this short, winter-time flood may not provide the ecological benefits associated with a FAF). (b) A floodplain reorganization flood on the Cosumnes River floodplain, March 23, 2005. (c) A floodplain activation flood on the Cosumnes River floodplain, April 2005. Note the development of algal mats in the water and on the vegetation.

Floodplain rearing of juvenile chinook salmon: evidence of enhanced growth and survival

T.R. Sommer, M.L. Nobriga, W.C. Harrell, W. Batham, and W.J. Kimmerer

Abstract: In this study, we provide evidence that the Yolo Bypass, the primary floodplain of the lower Sacramento River (California, U.S.A.), provides better rearing and migration habitat for juvenile chinook salmon (*Oncorhynchus tshawytscha*) than adjacent river channels. During 1998 and 1999, salmon increased in size substantially faster in the seasonally inundated agricultural floodplain than in the river, suggesting better growth rates. Similarly, coded-wire-tagged juveniles released in the floodplain were significantly larger at recapture and had higher apparent growth rates than those concurrently released in the river. Improved growth rates in the floodplain were in part a result of significantly higher prey consumption, reflecting greater availability of drift invertebrates. Bioenergetic modeling suggested that feeding success was greater in the floodplain than in the river, despite increased metabolic costs of rearing in the significantly warmer floodplain. Survival indices for coded-wire-tagged groups were somewhat higher for those released in the floodplain than for those released in the river, but the differences were not statistically significant. Growth, survival, feeding success, and prey availability were higher in 1998 than in 1999, a year in which flow was more moderate, indicating that hydrology affects the quality of floodplain rearing habitat. These findings support the predictions of the flood pulse concept and provide new insight into the importance of the floodplain for salmon.

Résumé : Notre étude démontre que le canal de dérivation Yolo, la principale plaine d'inondation de la région aval de la rivière Sacramento (Californie, É.-U.), offre de meilleurs habitats pour l'alevinage et la migration des jeunes Saumons Quinnat (*Onchorhynchus tshawytscha*) que les bras adjacents de la rivière. En 1998 et 1999, la taille des saumons a augmenté plus rapidement dans la plaine d'inondation agricole, sujette aux débordements saisonniers de crue, que dans la rivière, ce qui laisse croire à de meilleurs taux de croissance. De plus, des jeunes saumons marqués à l'aide de fils de métal codés et relâchés dans la plaine d'inondation étaient plus gros au moment de leur recapture et avaient des taux de croissance apparente plus élevés que des poissons relâchés dans la rivière en même temps. L'amélioration des taux de croissance dans la plaine de débordement résultait en partie d'une consommation significativement plus importante de proies, le reflet d'une plus grande disponibilité des invertébrés de la dérive. Un modèle bioénergétique laisse croire que le succès de l'alimentation a été meilleur dans la plaine d'inondation que dans la rivière, en dépit du coût métabolique d'alevinage significativement plus grand dans les eaux plus chaudes de la plaine d'inondation. Les indices de survie des poissons marqués et relâchés dans la plaine d'inondation étaient quelque peu plus élevés que ceux des poissons de la rivière, mais les différences n'étaient pas statistiquement significatives. La croissance, la survie, le succès de l'alimentation et la disponibilité des proies étaient tous supérieurs en 1998 par comparaison avec 1999, une année à débit plus modéré, ce qui indique que l'hydrologie affecte la qualité des habitats d'alevinage dans la plaine d'inondation. Nos résultats appuient les prédictions du concept de pulsion de crue (flood pulse concept) et mettent en lumière l'importance de la plaine d'inondation pour le saumon.

[Traduit par la Rédaction]

Introduction

Although the trophic structure of large rivers is frequently dominated by upstream processes (Vannote et al. 1980), there is increasing recognition that floodplains plays a major role in the productivity and diversity of riverine communities (Bayley 1995). Based largely on observations from relatively undisturbed river–floodplain systems, Junk et al. (1989) proposed the flood pulse concept, which predicts that annual inundation is the principal force determining productivity and biotic interactions in river–floodplain systems. Floodplains can provide higher biotic diversity (Junk et al. 1989) and increased production of fish (Bayley 1991; Halyk and Balon 1983) and invertebrates (Gladden and Smock 1990). Potential mechanisms for floodplain effects include increased habitat diversity and area (Junk et al. 1989), large inputs of

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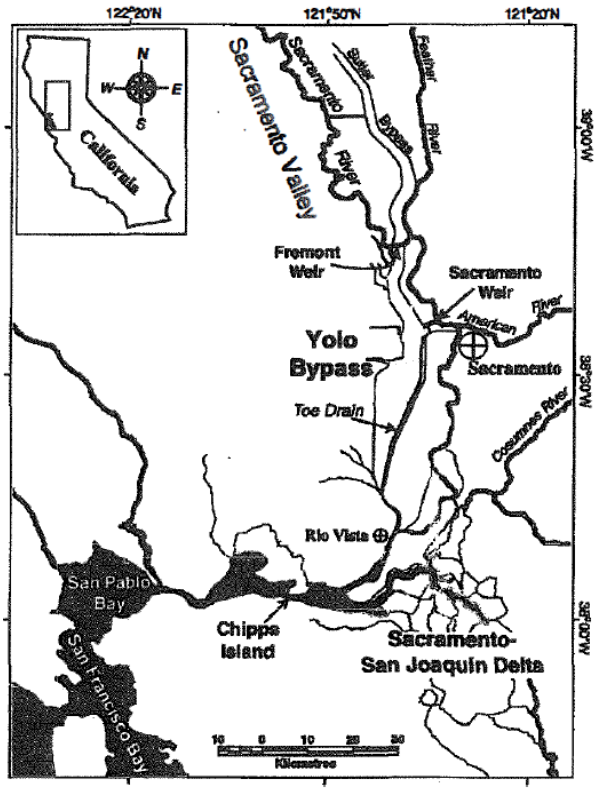
terrestrial material into the aquatic food web (Winemiller and Jepsen 1998), and decreased predation or competition due to intermediate levels of disturbance (Corti et al. 1997). Nonetheless, the degree to which floodplains support riverine ecosystems remains poorly understood, particularly in regulated and temperate rivers. Uncertainties about river-floodplain relationships are due, in large part, to the difficulty in separating the relative contribution of floodplain versus channel processes and sampling problems in seasonal habitats, which are frequently subject to extreme environ-mental variation.

In the this study, we examined the relative importance of floodplain and riverine habitat to juvenile chinook salmon (Oncorhynchus tshawytscha) in the Sacramento River (California, U.S.A.), a large regulated river (Fig. 1). The system is particularly well suited to a comparative study, because young salmon migrating down the lower Sacramento River to the San Francisco Estuary in wet years have two alternative paths: they may continue down the heavily channelized main river or they may pass through the Yolo Bypass, an agricultural floodplain bordered by levees. We had two reasons to believe that the floodplain might be important habitat for young salmon. First, years of high flow are known to en-hance populations of a variety of species in the San Francisco Estuary (Jassby et al. 1995) and the survival of chinook salmon (K.jelson et al. 1982). However, the specific mechanisms for these benefits have not been established. Possible reasons for the positive effects of flow on fish include increased habitat availability, migration cues, food supply, larval transport, and reduced predation rates (Bennett and Moyle 1996). Floodplain inundation is one of the unique characteristics of wet years, during which the Yolo Bypass is likely to be a significant migration corridor for young chinook salmon in the Sacramento Valley. During high-flow events, the Yolo Bypass can convey >75% of the total flow from the Sacramento River basin, the major producer of salmon among tributaries of the San Francisco Estuary. Second, floodplains are known to be among the most important fish-rearing areas in a variety of river systems, yet in developed regions, the availability of this habitat has been greatly reduced by channelization and levee and darn construction (Rasmussen 1996). A high degree of habitat loss may greatly enhance the biological significance of remnant flood-plains in heavily modified systems, such as the San Francisco Estuary and its tributaries.

This study tests the hypothesis that the agricultural flood-plain provides better habitat quality than the adjacent river channel. For the purpose of this analysis, we focus on salmon growth, feeding success, and survival as indicators of habitat quality. Obviously, there are many other possible measures of habitat quality, such as reproductive output of adults or physiological indicators. However, we believe that the chosen suite of parameters is reasonably representative of habitat quality. For example, Gutreuter et al. (2000) suc-cessfully used growth as a factor to test the hypothesis that floodplain inundation had a major effect on fish production.

The San Francisco Estuary is one of the largest estuaries on the Pacific Coast (Fig. 1). The system includes down-stream bays (San Pablo and San Francisco) and a delta, a broad network of tidally influenced channels that receive in-flow from the Sacramento and San Joaquin rivers. The estu-

Fig. 1. The location of Yolo Bypass in relation to the San Fran-cisco Estuary and its tributaries. The San Francisco Estuary encompasses the region from San Francisco Bay upstream to Sacramento. Feather River Fish Hatchery is located on the Feather River approximately 112 km upstream of Yolo Bypass.



ary and its tributaries have been heavily altered by levees, dams, land reclamation activities, and water diversions. The primary floodplain of the Sacramento River portion of the delta is the Yolo Bypass, a 24 000-ha leveed basin that conveys excess flow from the Sacramento Valley, including the Sacramento River, Feather River, American River, Sutter Bypass, and westside streams. The 61 km long floodplain floods seasonally in winter and spring in about 60% of years, and is designed to convey up to 14 000 $m^3 \cdot s^{-1}$. During a typical flooding event, water spills into the Yolo Bypass via the Fremont Weir when Sacramento Basin flows surpass approximately 2000 $m^3 \cdot s^{-1}$. Except during extremely high flow events, the mean depth of the floodplain is generally less than 2 m, creating broad shoal areas. During dry seasons, the Toe Drain channel, a permanent riparian corridor, remains inundated as a result of tidal action. At higher levels of Sacramento Basin flow (e.g., >5000 $m^3 \cdot s^{-1}$), the Sacramento Weir is also frequently operated. Agricultural fields are the dominant habitat type in Yolo Bypass, but approximately one-third of the floodplain area is natural vegetation, including riparian habitat, upland habitat, emergent marsh, and permanent ponds.

There are four races of chinook salmon in the Sacramento Valley: winter, spring, late fall, and fall run (Yoshiyama et al. 2000). Historical data indicate that all races have de-

creased in abundance since the 1950s, but the spring, winter, and late-fall runs have shown the most pronounced declines. There are multiple causes for these long-term reductions, in-cluding habitat loss, habitat degradation, water diversions, and oceanic conditions. In the present study, we focused on the fall run, the numerically dominant race in the Sacra-mento Valley. The typical life-history pattern for these salmon is for young to migrate from the tributaries to the bay-delta area at the "fry" stage (Brandes and McLain 2001), when most individuals are approximately 35- to 70- mm fork length (FL). In low flow years, there may be sub-stantial upstream rearing in the Sacramento River. Peak ju-venile emigration from the tributaries occurs during winter and spring (Kjelson et al. 1982).

Materials and methods

Physical conditions

During 1998-1999, flow measurements in Yolo Bypass and the adjacent stretch of the Sacramento River were obtained from gauges operated by the U.S. Geological Survey (USGS). Daily wa-ter temperatures for each site were calculated as the mean of maxi-mum and minimum daily measurements for single stations in the Sacramento River (USGS) and a temperature recorder (Onset Corp.) installed in the Yolo Bypass Toe Drain channel (Fig. 1). However, from 1 February to 26 March 1998, these data were not available for Yolo Bypass. During this period, before the recorder was installed, discrete measurements were taken at the same loca-tion, typically during mid or late morning.

Fish sampling

Salmon FL (mm) was measured during January-April in 1998 and 1999 on samples collected with 15-m beach seines (4.75-mm mesh). Samples were collected weekly at five core locations located around the perimeter of the Yolo Bypass, during periods when the basin was flooded. After the bypass drained, additional samples were collected at random locations around the perimeter of ponds near the core locations. Comparative data on salmon size in the adjacent reach of the Sacramento River were collected by the U.S. Fish and Wildlife Service (USFWS) at five beach-seine sites, using techniques similar to those used when the the bypass was flooded.

FLs of salmon obtained from beach-seine sampling were compared to determine whether there was evidence of major differences in salmon size between the Yolo Bypass and the Sacramento River. However, these data were not considered unambiguous evidence of growth differences, because the two systems were open to immigration and emigration during much of the study, and migrating salmon include multiple races of salmon that cannot be readily separated. We addressed this issue by using paired releases of coded-wire-tagged (CWT) juvenile salmon in Yolo Bypass and the Sacramento River. This approach allowed comparisons of growth among fish of similar origin and provided a relative estimate of mi-gration time and survival. The salmon were produced and tagged at the Feather River Fish Hatchery and released on 2 March 1998 and I l February 1999. The release sites were in Yolo Bypass below Fremont Weir (52 000 in 1998; !05 000 in 1999) and in the adjacent reach of the Sacramento River (53 000 in 1998; 105 000 in 1999). The fish had a mean FL of 57.5 ±0.5 mm (SE) in 1998 and of 56.8 ± 0.4 mm (SE) in 1999. A small portion of each group was subsequently collected by trawling at the seaward margin of the delta at Chipps Island, which is located downstream of the confluence of the Yolo Bypass and the Sacramento River (Fig. 1). The USFWS Chipps Island survey samples a single channel location with a midwater trawl towed at the surface (Baker et al. 1995; Brandes and McLain 2001). Ten 20-min tows were made each day, except during March in 1998 and 1999, when sampling was conducted every other day. Data on migration time (days) and FL (mm) were recorded for fish recaptured from each release group. Apparent growth rate was also calculated for each fish, as: (FL of individual at Chipps Island - mean FL of CWT release group) x (migration time)$^{-1}$. Survival indices of the paired CWT releases were calculated by USFWS by dividing the number of fish recovered for each release group at Chipps Island by the number released, corrected for the fraction of time and channel width sampled (Brandes and McLain 2001).

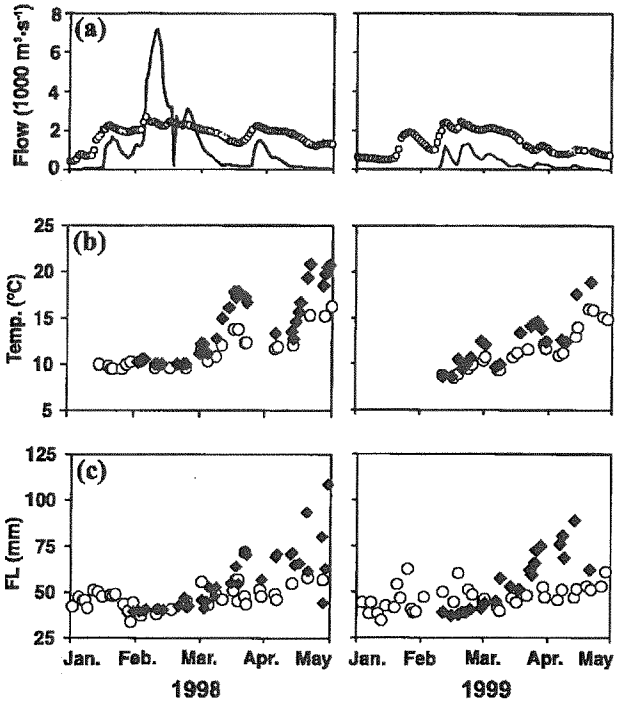
Diet

We performed diet comparisons on fall-run juvenile salmon (33-81 mm) collected in beach-seine samples during February-March of 1998 and 1999 from the Yolo Bypass (103 individuals) and the Sacramento River (109 individuals). Fish samples were tagged and stored individually in a deep freeze. After thawing, stomachs were removed from the fish and the contents were identified (using a dissecting microscope) to order (insects and arachnids), genus (crustaceans), or phylum (rarely eaten taxa such as oligochaetes). To develop average invertebrate length estimates, up to 10 individuals of each prey type encountered were measured. Prey dry weight estimates were calculated from average lengths, using regression equations for delta crustaceans obtained from J. Orsi (California Department of Fish and Game, Stockton, CA 95205, unpublished data) and from literature sources. Diet results were compared as an index of relative importance (IRI) (Shreffler et al. 1992) for each month. The index was calculated as: IRI = (% numeric composition+ % weight composition) x % frequency of occurrence.

Prey availability

Invertebrates were sampled in February-March of 1998 and 1999, to examine prey availability in the Yolo Bypass and the Sacramento River. Sampling was not designed as a comprehensive evaluation of spatial and temporal variation of prey. Rather, it was intended to provide information on whether variation in salmon diets between the two locations was consistent with gross differences in prey type or relative abundance. We focused on Diptera (adults, pupae, and larvae) and crustacean zooplankton, which comprised over 90% of the diets of Yolo Bypass and Sacramento River juvenile salmon. Weekly drift samples were collected at fixed stations on the Yolo Bypass and the Sacramento River during periods when the floodplain was inundated. The sampling points were located away from overhanging vegetation and bank eddies, in water velocities of approximately 15-60 cm·s^{-1}, depending on flow. Net (500-µm mesh) dimensions were 0.46 x 0.3 m mouth and 0.91 m length. The nets were fished for approximately 30 min during midmorning, to coincide with the time period when most fish-stomach samples were taken, Sample volume was calculated using a flowmeter (General Oceanics Model 2030R) and net dimensions. Drift samples were stored in ethanol or formaldehyde, then identified to family or order using a dissecting microscope. In 1998, zooplankton were collected in the Yolo Bypass at two fixed stations with battery-operated rotary-vane pumps with a mean flow rate of 17 L·mm^{-1}. Samples were taken via pipes with outlets at multiple locations beneath the water surface. Discharge was directed into a 150 µm mesh net held in a basin on the bank. Flow rate was recorded at the beginning and end of the sample period, which varied from 1 to 6 h. No samples were taken in the Sacramento River during a comparable period in 1998. In 1999, zoolankton samples were taken with a Clarke-Bumpus net (160-µm mesh, diameter 0.13 m, length 0.76 m) placed in surface flow in the Yolo Bypass and Sacramento River. Sample volume was recorded as for the drift net. Zooplankton samples were concentrated and stored in 5%

Fig. 2. Chinook salmon size versus physical conditions in Yolo Bypass and the Sacramento River during winter and spring in 1998 and 1999. (*a*) Mean daily flow ($m^3 \cdot s^{-1}$) in Yolo Bypass (solid line) and the Sacramento River (circles). (*b*) Mean water temperature (°C) in Yolo Bypass (solid symbols) and the Sacramento River (open symbols). (*c*) Mean daily chinook salmon FL for Yolo Bypass (solid symbols) and Sacramento River (open symbols) beach-seine stations. For presentation purposes, only the daily mean FLs are shown; however, individual observations for February–March were used for statistical analyses.



formaldehyde, for later identification to genus using a dissecting microscope.

Bioenergetics

Feeding success was examined in two ways: (1) prey biomass estimated from stomach contents and (2) prey biomass estimated as a function of maximum theoretical consumption. For the first measure, we used the previously described stomach-content data to calculate total-prey biomass for individual fish.

A limitation of using prey biomass as a measure of feeding success between locations is that thermal history affects how consumption alters growth rate (Hewett and Kraft 1993). As will be discussed in further detail, water temperatures were significantly higher in the Yolo Bypass floodplain than in the Sacramento River. To correct for this problem, our second approach used bioenergetic modeling to incorporate the metabolic effects of water temperature. We used methods similar to those of Rand and Stewart (1998) to calculate a wet weight ration index, which uses prey biomass for each sampled individual as a proportion of the theoretical maximum daily consumption. The stomach-content data were used as our estimate of prey biomass for individual fish. The theoretical maximum daily consumption rate (C_{max}) was modeled using Fish Bioenergetics 3.0 (Hanson et al. 1997), using observed body size and water temperature at the time each beach-seine sample was collected. The model input also required fish mass, which we estimated from FL data, using length–weight relationships from Sacramento River juvenile salmon (Petrusso 1998). The caloric value of the prey was taken from weight conversion factors provided by Hanson et al. (1997). Model parameters were derived from those of Stewart and Ibarra (1991) for chinook salmon. The model was run for individual fish collected at each sampling location in 1998 and 1999.

Table 1. Robust regression statistics for Yolo Bypass and Sacramento River salmon FLs for 1998 and 1999.

	1998		1999	
	Parameter ± SEM	*t*	Parameter ± SEM	*t*
Intercept	29.4±0.6	46.8	23.5±0.5	43.7
Location	6.4±0.6	10.2	11.1±0.5	20.6
Day	0.3±0.01	34.5	0.3±0.01	48.5
Location:day	−0.14±0.01	−18.4	−0.21±0.01	−33.6

Note: The *t* values are all highly significant ($p < 0.0001$).

We emphasize that the second approach provides an *index*, rather than an *absolute* measure of feeding success. The wet weight ration index is conceptually analogous to "*P*" in Hanson et al. (1997), a model parameter that indicates what fraction of C_{max} is obtained over the course of the day. The major difference is that *P* is based on prey consumption over a 24-hour period, whereas our wet weight ration index is based on instantaneous measurements of stomach contents, which may not represent mean trends over the entire day. An additional limitation is that the Stewart and Ibarra (1991) model parameters were developed for adult salmon and we applied the model to juveniles. We did not have sufficient field or laboratory data to develop bioenergetic-model parameters specific to the earliest life stages. Nonetheless, other studies (Rand and Stewart 1998) have demonstrated that similar wet weight ration indices can provide an effective technique for comparing relative salmonid feeding success between seasons and years.

Statistical analysis

Overlapping temperature measurements from continuous recorders and the discrete measurements during 26 March – May 1998 were analyzed with Wilcoxon's matched-pairs test, to determine whether the two methods yielded different results. Mean water temperature for Yolo Bypass and the Sacramento River during the primary period of floodplain inundation (February–March) was analyzed with a generalized linear model with a variance function that increased with the mean squared, since variances were not homogeneous (Venables and Ripley 1997). Salmon FL measurements for Yolo Bypass and the Sacramento River during February–March of 1998 and 1999 were compared with a robust iteratively reweighted least squares regression procedure ("rlm"; Venables and Ripley 1997), because we detected substantial numbers of outliers in preliminary graphical evaluations of the data. Initial analyses revealed a substantial difference in the effects of location between years, so years were analyzed separately. Results from the CWT and bioenergetic studies were analyzed using a factorial-design analysis of variance, to evaluate the effects of location (Yolo Bypass, Sacramento River) and year (1998, 1999). Residuals from each model were examined graphically, to confirm that they met the assumption of normality and homogeneity of variance. Cochran and Levene's tests were also used, to test the assumption of homogeneity of variance. Logarithmic transformation was performed where necessary.

Results

Physical conditions

Yolo Bypass was inundated in 1998 and 1999 but the hydrology was substantially different in the two years (Fig. 2).

Table 2. Results of salmon collections at Chipps Island for 1998 and 1999 coded-wire-tagged groups released concurrently in Yolo Bypass and the Sacramento River

	1998 – Yolo Bypass	1998 – Sacramento River	1999 – Yolo Bypass	1999 – Sacramento River
Fork length (mm)	93.7±2.0	85.7±1.4	89.0±2.6	82.1±1.7
Migration time (days)	46.2±2.3	55.4±3.5	58.2±2.8	58.6±4.1
Apparent growth rate (mm day^{-1})	0.80±0.06	0.52±0.02	0.55±0.06	0.43±0.03
Survival index	0.16	0.09	0.09	0.07
Sample size	9	10	9	8

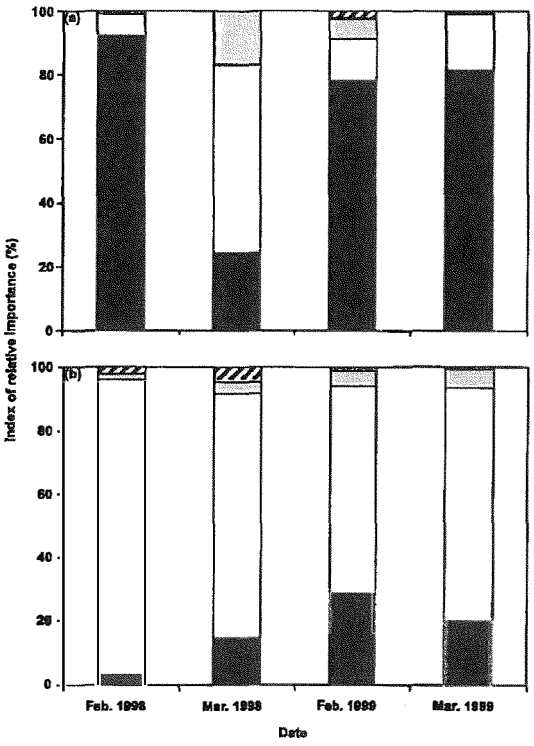
Note: Values for FL, migration time, and apparent growth rate are mean ± standard error (SEM)

The first year was extremely wet, with multiple flow pulses and a peak flow of 7200 $m^3 \cdot s^{-1}$. In 1999, floodplain hydrology was more moderate, with a peak of 1300 $m^3 \cdot s^{-1}$. Flows in the Sacramento River were much less variable than in the floodplain and generally remained at or below 2000 $m^3 \cdot s^{-1}$, a level within the design capacity (3100 $m^3 \cdot s^{-1}$) of the channel. Overlapping sampling between the continuous-temperature recorders and the discrete measurements during March–May 1998 showed a mean difference of 0.9°C between the two approaches, but this disparity was not statistically significant (Wilcoxon's matched-pairs test, $p > 0.25$). In 1998 and 1999, temperatures increased fairly steadily throughout the study period; however, in both years, temperature levels in Yolo Bypass were up to 5°C higher than those in the adjacent Sacramento River during the primary period of inundation, February–March. Temperature in the Yolo Bypass was described in 1998 by $T_y = -7.7 \pm 2.1 + (1.9 \pm 0.2)T_s$ and in 1999 by $T_y = -3.5 \pm 1.2 + (1.5 \pm 0.1)T_s$, where T_y is the temperature of the Yolo Bypass, T_s is the temperature of the Sacramento River, and the range for each value is the 95% confidence limit.

Fish growth, migration time, apparent growth rate, and survival

Salmon increased in size substantially faster in the Yolo Bypass than in the Sacramento River during each of the study years (Fig. 2). Robust regression results showed that the effect of location was highly significant ($p < 0.00001$) in each year (Table 1). This result is consistent with the CWT data (Table 2), which showed that the 1998 and 1999 Yolo Bypass CWT release groups had significantly larger mean length ($F = 14.34$, $p = 0.0006$) and higher apparent growth rates ($F = 20.67$, $p = 0.0007$) than the Sacramento River release groups. There was also a statistically significant effect of year: both release groups had larger mean sizes ($F = 4.42$, $p = 0.04$) and higher apparent growth rates ($F = 16.47$, $p = 0.0002$) in 1998 than in 1999. The 1998 Yolo Bypass CWT group showed the fastest migration time, arriving an average of at least 9 days ahead of any other release group. However, there was no statistically significant ($F = 2.22$, $p = 0.15$) effect of release location on migration time in the analysis of variance (ANOVA). As for fish size and apparent growth rate, mean migration time was slower in 1999 than in 1998 ($F = 5.60$, $p = 0.02$). There was no statistically significant interaction between location and year for salmon size ($F = 0.07$, $p = 0.78$), apparent growth rate ($F = 1.62$, $p = 0.21$), or migration time ($F = 1.8$, $p = 0.18$). The survival indices were somewhat higher for CWT groups released in the Yolo Bypass than for those released in the Sacramento River for both 1998 and 1999. However, the lowest coefficient of variation based on a Poisson distribution of the CWT recaptures is 32%, and the actual (unknown) distribution of counts is likely to have higher variance than a Poisson distribution. Clearly the confidence limits of the paired survival indices would overlap, so the differences are not statistically significant.

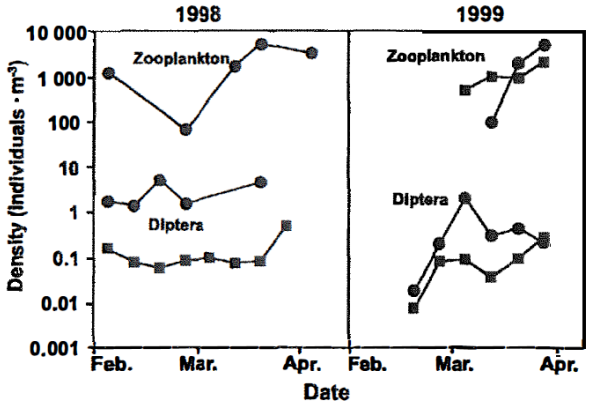
Fig. 3. Chinook salmon diet during February and March of 1998 and 1999 in Yolo Bypass (*a*) and the Sacramento River (*b*). The index of relative importance (*y*-axis) is defined in the text. Diptera (solid bars), zooplankton (open bars), other aquatic prey (shaded bars), and other terrestrial prey (striped bars) are shown for each month.



Diet

The diet of young salmon in the Yolo Bypass was dominated by dipterans, principally chironomid pupae and adults (Fig. 3). The second most common prey item was zooplank-

Fig. 4. Log_{10}-scaled weekly abundance (individuals·m^{-3}) of zooplankton and Diptera in Yolo Bypass (circles) and the Sacramento River (squares) during 1998 and 1999. Note that 1998 zooplankton data were not available for the Sacramento River.



ton, mostly cladocerans and copepods. Except for March 1998, zooplankton comprised less than 15% of the Yolo Bypass diets. Other aquatic (mainly amphipods and collembola) and terrestrial (mainly ants and arachnids) prey were relatively minor diet items. As for the floodplain sam-ples, dipterans and zooplankton comprised over 90% of the diets of Sacramento River salmon; however, zooplankton were the dominant prey item in all months. Other aquatic (mostly amphipods, oligochaetes, and collembola) and terrestrial (mostly ants and other terrestrial insects) prey were consumed infrequently.

Prey availability

The drift samples contained many of the same taxa observed in the salmon diets, with Diptera (principally chironomids) as the major type at both sampling locations. However, the density of Diptera was much higher in the Yolo Bypass than in the Sacramento River (Fig. 4), particularly in 1998, when densities were consistently an order of magnitude higher. In general, dipteran drift densities were higher at each location in 1998 than in 1999. There was little difference in zooplankton density in the Yolo Bypass be-tween 1998 and 1999 or between Yolo Bypass and the Sacramento River in 1999.

Bioenergetics

Young salmon from the Yolo Bypass had higher total-prey weights (F = 39.2, df = 1, p <0.0001) than those from the Sacramento River (Fig. 5). The bioenergetic-modeling results showed that Yolo Bypass salmon also had higher wet weight ration indices than those from the Sacramento River (F = 19.3, df= l, p <0.0001). The interaction between location and year was significant for both the wet weight ration indices (F = 10.0, df = 1, p = 0.02) and the prey weights (F = 4.7, df = 1, p = 0.03).

Discussion

Chinook salmon that rear in the Yolo Bypass floodplain have higher apparent growth rates than those that remain in the adjacent Sacramento River channels. Mean length increased faster in the Yolo Bypass during each study yar, and CWT fish released in the Yolo Bypass were larger and had higher apparent growth rates than those released in the Sacramento River. It is possible that these observations are due to higher mortality rates of smaller individuals in the Yolo Bypass or of larger individuals in the Sacramento River, however we have no data or reasonable mechanism to support this argument.

Apparent growth differences between the two areas are consistent with water temperature and stomach-content results. We found that the Yolo Bypass floodplain had significantly higher water temperatures and that young salmon from the floodplain ate significantly more prey than those from the Sacramento River. The wet weight ration indices calculated from bioenergetic modeling suggest that the increased prey availability in Yolo Bypass was sufficient to offset increased metabolic requirements from higher water temperatures. Higher water temperatures in the Yolo Bypass are expected as a result of the shallow depths on the broad floodplain. Increased feeding success in the Yolo Bypass is consistent with trends in prey availability. While Yolo Bypass and the Sacramento River had similar levels of zooplankton, Yolo Bypass had more dipteran prey in the drift, particularly in 1998. Studies of juvenile chinook salmon diets by Rondorf et al. (1990) showed that zooplankton were the least-favored prey items. Therefore, the dominance of zooplankton in the diets of Sacramento River salmon probably reflects a relatively low availability of other more energetically valuable prey items.

Recoveries of paired releases were too few to determine whether the higher survival indices for the Yolo Bypass release groups represent actual survival differences or random variation. Additional validation is needed from new release studies and from CWT recoveries in the adult ocean fishery and escapement. Nonetheless, the hypothesis that floodplain rearing could improve survival is substantiated by the growth data and bioenergetic modeling. Faster growth rates reflect improved habitat conditions, which would be expected to lead to improved survival, both during migration and later in the ocean. Elevated Yolo Bypass survival rates are also consistent with significantly faster migration rates in 1998, the likely result of which would be reduced exposure time to mortality in the delta, including predation and water diversions.

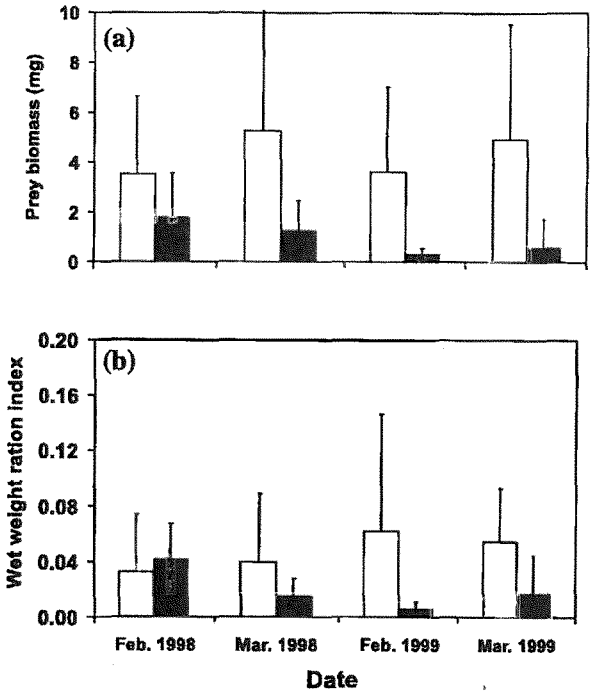
Improved survival is consistent with other habitat differences between the Yolo Bypass floodplain and the Sacramento River channel. We estimate that complete inundation of the Yolo Bypass creates a wetted area approximately 10 times larger than the reach of the Sacramento River we studied. This level of inundation is equivalent to a doubling of the wetted area of the entire delta portion of the San Francisco Estuary. Much of the floodplain habitat consists of broad shoals composed of soil and vegetation that are typical of the low-velocity conditions selected by young salmon (Everest and Chapman 1972). An increase in rearing area should reduce competition for food and space and perhaps reduce the probability of encountering a predator. In contrast, the Sacramento River channel is relatively narrow, with steep rock-reinforced banks and little shallow habitat. Mi-gration through the Yolo Bypass corridor would also prevent

fish from entering the channels of the central delta, in which there are various risks, including major water diversions (Brandes and McLain 2001). However, the Yolo Bypass is a less-stable environment, with stranding risks when flood waters recede. The relatively well-drained topography of the Yolo Bypass floodplain may help to reduce the magnitude of this problem. This is not to say, however, that access to floodplain rearing habitat represents the only mechanism to account for possible improvements in juvenile salmon survival in wetter years. Other covariates, such as reduced water temperature (Baker et al. 1995), reduced predation losses from higher turbidity (Gregory and Levings 1998), and reduced water diversion effects (Kjelson et al. 1982), also contribute to improved wet-year survival of salmon that migrate through the San Francisco Estuary.

The results from this study suggest that hydrology may affect salmon feeding success, migration, and survival in both floodplain and river habitat. The CWT results indicate that salmon grew faster, migrated faster, and may have had better survival rates in 1998 than in 1999. One clear difference between the years is that the flow pulses were higher and of longer duration in 1998 than in 1999. Higher flow could directly increase migration rates through higher water velocities and have multiple indirect effects on growth through factors such as food supply or water temperature. The abundance of Diptera in drift samples was substantially higher in 1998 than in 1999 in both locations. The significant interaction between location and year for both prey weights and the wet weight ration index indicates that the combined effects of diet and water temperature under 1998 hydrology should have resulted in higher growth rates. Higher growth rates and faster migration times in 1998 may, in turn, have improved survival by reducing predation risk. Higher-flow conditions in 1998 increased the quantity and duration of floodplain rearing area, perhaps reducing resource competition and predator encounter rates. Increased flow duration and magnitude in 1998 could also have improved survival on the floodplain by reducing stranding risks.

These results provide new insight into the significance of seasonal floodplain habitat for salmon rearing, which has been studied primarily in perennial waterways such as estuaries and rivers (Healey 1991; Kjelson et al. 1982). Indeed, this is the first study we are aware of demonstrating that off-channel floodplain provides major habitat for chinook salmon. We do not believe that the benefits of the floodplain to chinook salmon are unique to Yolo Bypass. Initial results from the Cosumnes River, an undammed watershed in the delta, show similar growth enhancements for juvenile chinook salmon that rear on the floodplain rather than in adjacent river channels (Peter Moyle, University of California, Davis, CA 95616, personal communication). Moreover, the benefits of the floodplain to salmon are consistent with findings for other fish species. Sommer et al. (1997) found that the Yolo Bypass provides major spawning, rearing, and foraging habitat for the native cyprinid Sacramento splittail (*Pogonichthys macrolepidotus*). The spawning and rearing of fish on floodplains has been reported in diverse locations that range from small streams (Halyk and Balon 1983; Ross and Baker 1983) to large rivers (Copp and Penaz 1988) in both temperate (Gehrke 1992; Turner et al. 1994) and tropical (Winemiller and Jepsen 1998) locations. The growth effects of floodplain habitat have been described for several tropical locations (Welcomme 1979); however, the present study and the results of Gutreuter et al. (2000) represent the only examples from temperate rivers of which we are aware.

Fig. 5. Feeding success results for Yolo Bypass (open bars) and Sacramento River (solid bars) juvenile salmon during 1998 and 1999. (*a*) Estimated prey weights in stomach contents. (*b*) Wet weight ration indices. Means and standard errors are shown.



Differences between the invertebrate communities in floodplains versus river channels have been reported by Castella et al. (1991). The exceptional production of drift invertebrates on the Yolo Bypass floodplain is consistent with the results of Gladden and Smock (1990), who found that invertebrate production was one to two orders of magnitude greater on the floodplain than in adjacent streams. Although we did not monitor benthic invertebrates, results from other studies of large rivers indicate that benthic biomass may be up to an order of magnitude higher in the floodplain (Junk et al. 1989). The Yolo Bypass drift invertebrate results contrast with the results for zooplankton, which were not particularly abundant on the floodplain. This finding is comparable with that of Welcomme (1979), who reported that densities of zooplankton in natural floodplains are frequently low, except for low-water periods and localized concentrations near habitat interfaces such as shorelines.

The mechanism for greater abundance of drift invertebrates in the Yolo Bypass remains unclear, but is unlikely to be an artifact of land use on the floodplain. Possible explanations for increased drift abundance include increased food supply (e.g., primary production or detritus), more habitat, and longer hydraulic residence times. For each of these mechanisms, Yolo Bypass probably provides functions similar to more "natural" floodplains. Improved food supply is supported by the work of Jassby and Cloern (2000), whose

modeling studies suggest that the Yolo Bypass should have enhanced phytoplankton production as a result of its large surface area and shallow depth. Inputs of fertilizers from agriculture in the Yolo Bypass would not be important contributing factors, as nitrogen and phosphorous are rarely limiting to phytoplankton production in the delta (Ball and Arthur 1979). Like less-disturbed floodplains in other regions (Junk et al. 1989), invertebrate production in the Yolo Bypass may be stimulated by an increased availability of detritus in the food web. Alternatively, the trends in invertebrate abundance we observed may be a consequence of physical differences between floodplain and channel habitat. Inundation of the floodplain may increase the amount of habitat for benthic invertebrates, a major source of drift biomass. Given the larger surface area and lower velocities in Yolo Bypass, the floodplain probably has a much longer hydraulic residence time than the Sacramento River, reducing the rate at which drift invertebrates would be flushed out of the system. Increased habitat area and hydraulic residence time would also have been functional characteristics of the historical floodplain.

In the broader context, the results for salmon and drift invertebrates are consistent with the flood pulse concept, which predicts that floodplains should yield greater fish and invertebrate production than channel habitat (Junk et al. 1989). This finding is significant in that the flood pulse concept was developed primarily on the basis of relatively undisturbed rivers, whereas our study was conducted in a regulated river with a floodplain dominated by agricultural uses. Gutreuter et al. (2000) showed similar enhancements in fish growth from floodplain inundation in the Upper Mississippi River, another large regulated river. These studies suggest that floodplains can maintain important functional characteristics even in heavily modified rivers. In the case of the San Francisco Estuary and its tributaries, we do not claim that floodplain inundation is the primary factor regulating the productivity of the system. The Yolo Bypass floodplain may be seasonally more productive than the Sacramento River for some fish and invertebrates, but we have no data regarding its contribution during dry months or years. Nonetheless, the results of the present study and of Sommer et al. (1997) are sufficient to demonstrate that the floodplain represents one of the most biologically important habitat types in the region. We believe that proposed large-scale restoration activities in the San Francisco Estuary and its tributaries (Yoshiyama et al. 2000) that would increase the area and connectivity of the floodplain offer particular promise for native fish populations such as chinook salmon and Sacramento splittail.

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Habitat Use and Stranding Risk of Juvenile Chinook Salmon on a Seasonal Floodplain

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Abstract.—Although juvenile Chinook salmon Oncorrhynchus tshawtscha are know to use a variety of habitat, their use of seasonal floodplains, a highly variable and potentially risky habitat, has not been studied extensively. Particularly unclear is whether a seasonal floodplain is a net "source" or a net "sink" for salmonid production. To help address this issue, we studied salmon habitat use in the Yolo Bypass, a 24,000-ha floodplain of the Sacramento River, California. Juvenile salmon were present in the Yolo Bypass during winter-spring; fish were collected in all regions and substrates of the floodplain in diverse habitat. Experimental releases of tagged hatchery salmon suggest that the fish reared on the floodplain for extended periods (mean = 33 d in 1998, 56 d in 1999, and 30 d in 2000). Floodplain rearing and associated growth are also supported by the significantly larger size of wild salmon at the floodplain outlet than at the inlet during each of the study years. Several lines of evidence suggest that although the majority of young salmon successfully emigrated from the floodplain, areas with engineered water control structures had comparatively high rates of stranding. Adult ocean recoveries of tagged hatchery fish indicate that seasonal floodplains support survival at least comparable with that of adjacent perennial river channels. These results indicate that floodplains appear to be a visible rearing habitat for Chinook salmon, making a floodplain restoration an important tool for enhancing salmon production.

A large downstream movement of fry to provide dispersal to rearing areas is typical of ocean-type Chinook salmon Oncorhynchus tschawytcha (Healey 1991). Rearing areas include channel and offchannel habitat in natal and nonnatal streams and their estuaries (Bjornn 1971; Kjelsen et al. 1982; Levy and Northcote 1982; Swales et al. 1986; Swales and Levings 1989; Healey 1991; Shreffler et al. 1992). Recently, Sommer et al. (2001b) observed that juvenile Chinook salmon also live on seasonal floodplains. Large rivers and streams typically have dynamic floodplains varying in size from several to thousands of hectares, unless their channels are heavily confined by topography (e.g., streams at high elevation or confined by canyons or levees). Floodplains are known to be of major importance to aquatic ecosystems in most regions; large rivers typically favor the development of a fauna adapted to colonize this habitat (Welcomme 1979; Junk et al. 1989; Sparks 1995). As a result, it is reasonable to expect dispersing salmonid fry show some ability to use seasonal habitat. In support of this hypothesis, Sommer et al. (2001b) reported that food resources and water temperatures on the seasonal floodplain of a large river were superior to those in an adjacent perennial channel, resulting in enhanced growth rates of young salmon. Despite some evidence that enhanced growth on the floodplain improved fry-smolt survival(2001b) did not address in the estuary, Sommer et al. any effects on adult production.

Intuitively, rearing in seasonal floodplains or intermittent streams seems risky because these habitats are among the most dynamic on earth (Power et al. 1995). It is still unknown whether seasonally dewatered habitats are a net "source" or a "sink" for salmonid production relative to production in permanent stream channels (Brown 2002). In particular, the high degree of seasonal flow fluctuation characteristic of floodplain habitat could cause major stranding events and increase mortality rates of young salmon (Bradford 1997; Brown 2002). For resident taxa in intermittent streams, the benefits of very large flow fluctuations appear to outweigh costs associated with a variable environment (Spranza and Stanley 2000). This issue continues to be a key concern for regulatory agencies that evaluate off-channel restoration projects or proposed flow fluctuations for possible effects on fishes (Brown 2002; Bruce Oppenheim, NOAA Fisheries, personal communication).

Here, we describe spatial and temporal trends in juvenile Chinook salmon habitat use and stranding in a large California river floodplain. Our study was conducted in the Yolo Bypass, the primary floodplain of the Sacramento River, the major pro-

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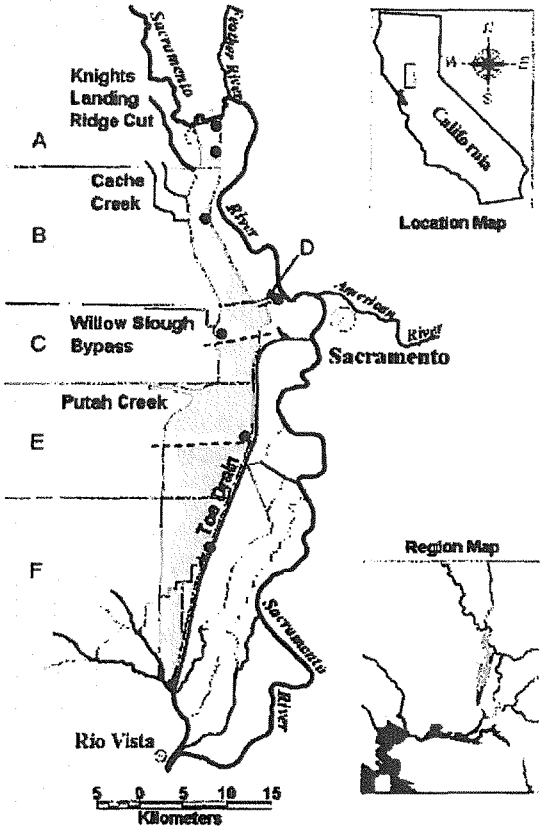

FIGURE 1.—Location of Yolo Bypass in relation to the San Francisco Bay–Delta and its tributaries. Fremont Weir is the upper (northern) edge of the Yolo Bypass. The major regions of the floodplain are delineated from north to south and correspond to the following codes: (A) Fremont Weir; (B) Cache Creek sinks; (C) Yolo Bypass Wildlife Area; (D) Sacramento Bypass; (E) Putah Creek Sinks; and (F) Liberty Island. The sampling locations are identified as follows: beach seine sites (solid circles); screw trap (star); and purse seine transects (dotted lines).

ducer of salmon in the San Francisco estuary (Figure 1). Because the Yolo Bypass can convey 75% or more of the total flow from the Sacramento River basin (Sommer et al. 2001a), this floodplain can be expected to be a migratory pathway for a substantial number of juvenile Chinook salmon. A major objective of our study was to collect basic information about the timing, duration, and habitat use of salmon on floodplains. We hoped that these data would provide insight into whether a floodplain is a net source (i.e., with rearing benefits) or a net sink (i.e., with high mortality because of stranding or predation) for salmon populations. The major hypotheses evaluated were as follows: (1) salmon occur in all major habitat types and geographic regions; (2) floodplains provide rearing habitat for salmon and are not simply a migration corridor; and (3) stranding of juvenile salmon does not have a major population-level effect on survival of the fish that use floodplain habitat. We addressed these hypotheses by sampling wild fish throughout the floodplain, experimentally releasing tagged fish, and using hydrologic modeling and measurements of physical conditions to describe how habitat varied over the study period.

Study Area

The San Francisco Estuary and its two component regions, Sacramento–San Joaquin Delta and downstream bays (Figure 1), make up one of the largest estuaries on the Pacific coast of North America. Major changes to the system have included diking and isolation of about 95% of the wetlands, introduction of exotic species, channelization, sediment inputs from hydraulic mining, and discharge of agricultural and urban chemicals (Nichols et al. 1986; Kimmerer 2002). The Estuary receives most freshwater via the Delta, which drains approximately 100,000 km^2. Most precipitation occurs upstream of the Delta during winter and spring, resulting in a greater than 10-fold seasonal range of daily freshwater flow into the estuary. However, the hydrograph is substantially altered by dams on each of the major rivers. Peak flow pulses typically occur during winter, but dam operations can reduce the magnitude of the pulses, particularly in dry years, when much of the inflow is captured behind reservoirs (Mount 1995; Kimmerer 2002). The historically prominent spring flow pulse from snowmelt is at present muted except during heavy, late-season storms. For the past several decades, much of the spring snowmelt has been stored in reservoirs and released during summer and autumn, periods of historically lower flow. As much as 65% of the net Delta flow during summer and autumn is diverted from the channels by two large water diversions (the State Water Project and the Central Valley Project); additional water is diverted by 2,200 pumps and siphons for irrigation (Kimmerer 2002).

The 24,000-ha Yolo Bypass is the primary floodplain of the Delta (Sommer et al. 2001a). The majority of the floodplain is leveed to protect surrounding cities from floodwaters, but levees confine flow through the bypass only under very high flow events. The Yolo Bypass currently floods an average of every other year, typically under high-flow periods in winter and spring. The Yolo Bypass has a complex hydrology, with inundation possible

from several different sources. The floodplain typically has a peak inundation period during January–March but can flood as early as October and as late as June. The primary input to the Yolo Bypass is through Fremont Weir in the north, which conveys floodwaters from the Sacramento and Feather rivers. During major storm events (e.g., >5,000 m^3/s), additional water enters from the east via the Sacramento Weir, adding flow from the American and Sacramento rivers. Flow also enters the Yolo Bypass from several small streams on its western margin, including Knights Landing Ridge Cut, Cache Creek, and Putah Creek. During much of the winter, water-suspended sediment levels in the Yolo Bypass and Sacramento River are high, generally resulting in secchi depths of less than 0.25 m. However, hydraulic residence times are typically longer in the Yolo Bypass than in the Sacramento River (Sommer et al. 2004). Floodwaters recede from the northern and western portions of the bypass along relatively even elevation gradients of 0.09% west–east and 0.01% north–south into a perennial channel on the eastern edge of the Bypass; they then rejoin the Sacramento River near Rio Vista. The majority of the Yolo Bypass is at present managed for wildlife in a mosaic that includes riparian, wetland, upland, and perennial pond habitats; however, a dominant land use during the past two decades, agriculture has decreased in recent years because of habitat restoration activities.

Our data collection focused on the fall-run juvenile Chinook salmon, currently the numerically dominant race in the Sacramento Valley (Yoshiyama et al. 2000). There are four races of Chinook salmon in the Sacramento Valley: winter, spring, late-fall, and fall-run. Like many other native fish, Chinook salmon in the San Francisco estuary and its tributaries have been adversely affected by such factors as habitat loss, water diversions, and species introductions (Bennett and Moyle 1996); as a result, the Sacramento River winter and spring run Chinook salmon are protected under the Federal Endangered Species Act. The typical life history pattern is for young fall-run salmon fry (approximately 35–70 mm fork length) to migrate from the tributaries during winter and spring to the estuary (Brandes and McLain 2001).

Methods

Physical habitat.—Because seasonal hydrologic variability is a key characteristic of floodplain habitat, we reasoned that detailed data on changes in physical habitat would be necessary to evaluate the responses of young salmon. Daily flow data were obtained from gauging stations in the floodplain, and temperature data were collected using continuous temperature recorders (Sommer et al. 2001b). However, the vast area of Yolo Bypass made it impractical to directly measure other parameters, such as depth and surface area. As an alternative, we used a hydrologic model to estimate these parameters (Sommer et al. 2004). To summarize, the model treated Yolo Bypass as a "reservoir" described by (1) basin geometry and (2) flow and stage time series. The Yolo Bypass floodplain geometry was developed from 200 cross-sections with data collected at 300-m intervals by standard rod and level survey techniques. Mean daily stage and flow data were obtained from five gauging stations in the Yolo Bypass. For each date in the time series, we used linear interpolation between the gauging stations to estimate the stage at each cross-section. The estimated stage value was then used to calculate conveyance characteristics of each cross-section: area, width, and wetted perimeter. The daily results for each cross-section were used to estimate total surface area and mean depth. The large scale of the study reach did not allow validation of the depth estimates. As a partial validation of the model, Sommer et al. (2004) estimated total inundated area for the Yolo Bypass by using aerial photographs on days when the floodplain was inundated (February 8 and March 2, 1998) and when the floodplain was draining (April 28, 1998). To provide additional information about areas where fish stranding and consequent losses could occur, we estimated the portion of the area that was isolated ponds versus inundated area that was actively draining to the Delta (i.e., perennial channels and adjacent inundated area) on April 28, 1998.

Fish habitat use.—We used beach seine sampling to examine which regions and substrates of the floodplain were used by young salmon (hypothesis 1). During January through April of each year, a 15-m seine (3.2-mm mesh) was used to sample six regions of the Yolo Bypass (Figure 1). Fixed stations were used in each region during flooded periods. After floodplain drainage, samples were collected randomly within each region. For all periods, the primary substrate type of the habitat (sand, mud, gravel, pavement, or vegetation), fish species and size, and an estimate of the surface area swept by the seine were recorded. Habitat use during flood events was summarized in terms of the percentage of samples that contained salmon for each region and substrate type.

To provide additional information about habitat use, we conducted purse seine sampling along two transects (Figure 1). This sampling, performed in 1998 when the Yolo Bypass flow was relatively high (>850 m^3/s), used purse seines (30.5 m × 4.6 m, 4.75-mm mesh) set from a jet boat. Purse seining was conducted at 1–2 transects up to five times weekly, depending on hydrology. Hauls were made at random points in each of three habitat types (riparian, agricultural fields, and wetlands), the boundaries of which were established from aerial photographs taken before the Bypass was inundated. In the case of riparian habitat, hauls were made in clearings adjacent to trees to avoid snagging. We also recorded transect side (east or west half) for each haul because the western side of the Yolo Bypass was shallower and flow was dominated by inputs from westside streams rather than from Fremont or Sacramento weirs (Sommer et al. 2004). Most of these hauls were performed in areas exposed to at least a modest current. Additional limited paired sampling was conducted to examine possible differences between areas with and without velocity refuges. Low-velocity habitats sampled included downstream edges of levees, islands, and clusters of trees. Water velocities in randomly selected areas were approximately 0–0.05 m/s compared with greater than 0.33 m/s in adjacent exposed areas. Water depths were similar for each sampling pair. Differences in salmon densities for each habitat type were examined by using a Kruskal–Wallace test. A randomization *t*-test with 1,000 iterations (Haddon 2001) was used to compare salmon density on the east and west sides of the floodplain.

Migration trends.—To examine temporal trends in salmon migration through the floodplain (hypotheses 2 and 3), we operated a rotary screw trap (EG Solutions, Corvallis, Oregon) near the base of the Yolo Bypass during each study year. This technique was intended to provide an indication of the timing and duration of migration, rather than an absolute measure of the number of salmon emigrating the floodplain. During much of the sampling period the inundated width of the floodplain was 1–5 km, an area we considered too large for the traditional mark–recapture evaluations required to measure trap efficiency and total emigration (Roper and Scarnecchia 1996). A 1.5-m-diameter trap was used for the first 3 weeks of sampling in February 1998, after which a 2.4-m trap was used for all other sampling. We operated traps as often as 7 days each week, the daily effort varying from 1 to 24 h, depending on debris load and safety considerations. Fish number and size were recorded in all years. In 1998, young salmon were classified as fry (prominent parr marks) or transitional fish/smolts (faded parr marks, silver appearance).

Floodplain residence time and growth.—We used experimental releases of salmon with coded wire tags (CWTs) as our primary method to evaluate fish residence time on the floodplain (hypothesis 2). Fry (mean size = 57 mm fork length) from the Feather River Fish Hatchery (Figure 1) were tagged by using coded-wire half tags (Northwest Marine Technologies) and released in the Yolo Bypass below the Fremont Weir on March 2, 1998 (53,000 fry); February 11, 1999 (105,000 fry); and February 22, 2000 (55,000 fry). We assessed residence time in the Yolo Bypass from recoveries of tagged fish in the screw trap at the base of the floodplain.

We also examined, using the previously described beach seine data, whether there was evidence of long-term rearing of wild salmon in the floodplain. We compared the slopes of weekly fork length measurements for the two northern beach seine regions ("North") to the southernmost region ("South"), using a generalized linear model (GLM) with a Poisson distribution and log link variance function. We reasoned that major significant differences between the sizes of fish in the two areas provided evidence of extended rearing and growth of fish in the floodplain.

Salmon survival and stranding.—We used several independent data sources to examine whether salmon successfully emigrated from the floodplain (hypothesis 3). First, we compared survival of each of the Yolo Bypass CWT hatchery-reared salmon release groups with the survival of parallel CWT groups containing the same number of fish released into the Sacramento River (Sommer et al. 2001b). Recapture rates at the smolt stage of the 1998 and 1999 release groups had previously been analyzed by Sommer et al. (2001b); in the present study, we evaluated adult recoveries in the commercial and recreational ocean fisheries through 2003. Second, we examined stranding by using beach seine data (described previously) collected within a few weeks after the Sacramento River stopped flowing into the Yolo Bypass. Densities of salmon were compared with a randomization *t*-test (Haddon 2001) for (1) isolated earthen ponds (2) perennial channels, and any sites immediately adjacent to these water sources. The results for all years were pooled because of relatively low sample sizes for individual years. Data for each year

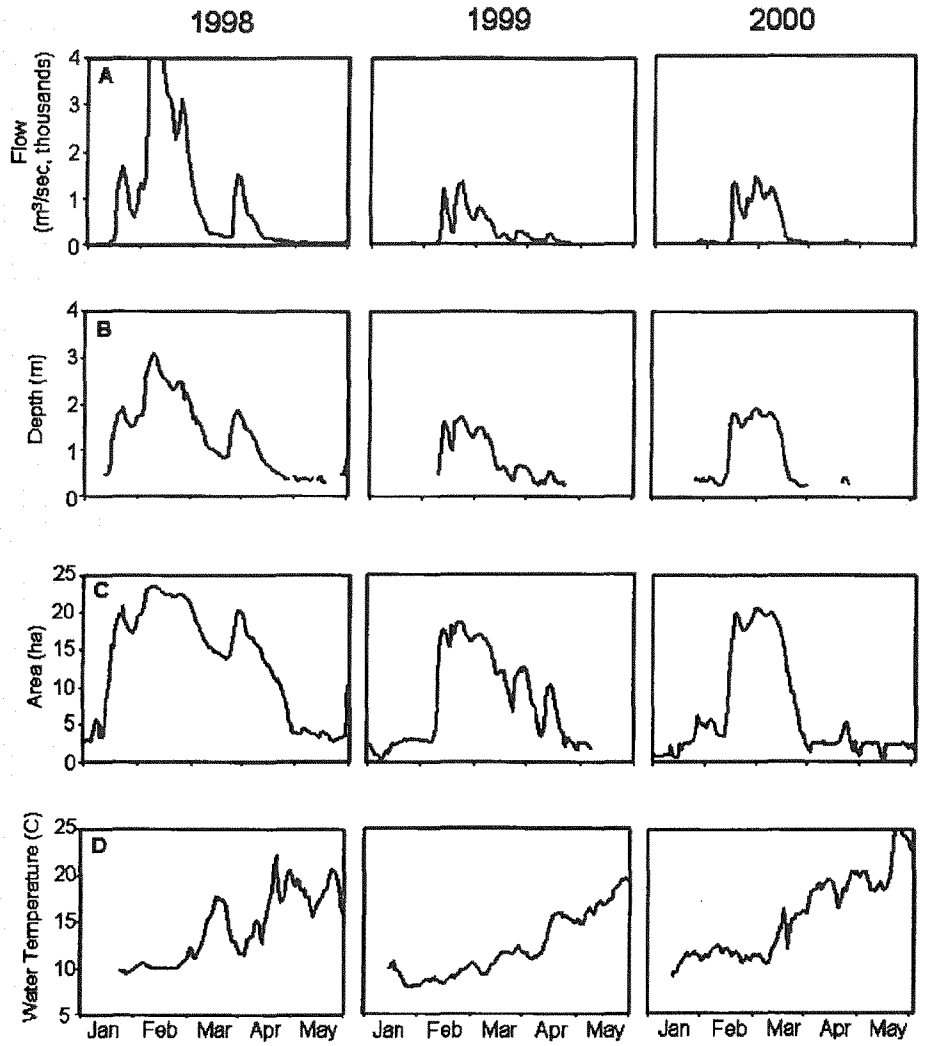

FIGURE 2.—Trends in physical variables for January–June 1998–2000: (A) mean daily flow in the Yolo Bypass; (B) simulated mean daily depth; (C) surface area; and (D) daily mean water temperature. The surface area data for 1998 and 2000 are from Sommer et al. (2004).

were first standardized for possible annual differences in abundance by conversion to *z*-scores; we then ran the randomization analysis using 1,000 iterations. We hypothesized that abundance of salmon would be equal in isolated ponds and contiguous water sources; that is, they would show no distinct "preferences." Our reasoning was that similar abundance levels would indicate successful emigration, because most of the water drains from the floodplain. To further understand factors that could affect stranding, we also used a randomization *t*-test to compare densities of fish in two types of isolated ponds: isolated earthen ponds and concrete weir scour ponds at Fremont and Sacramento weirs (Figure 1). Sampling effort was much greater in the isolated earthen ponds, so the randomization *t*-test was performed after randomly subsampling the earthen pond data from throughout the floodplain to provide equal sample sizes. We predicted that flood control structures would cause higher stranding than "natural" ponds. In addition, we examined trends in the catch of salmon in the screw trap data. We predicted that salmon catch would increase substantially during drainage because fish successfully emigrated the floodplain.

Results

Physical Habitat

The hydrographs varied substantially during the years of study (Figure 2A). In 1998 the hydrology

was wet (4.4-year recurrence flood event) and the Yolo Bypass was inundated during mid-January through mid-April and again in early June. The flow was lower in the other 2 years, when inundation occurred between mid-February and mid-March, peak flood events being at the 1.7-year recurrence interval in 1999 and at the 2.4-year recurrence interval in 2000. Surface area in the Yolo Bypass closely followed the flow peaks, the amounts of inundated area being successively smaller in each of the study years (Figure 2C). For the April 28, 1998, photographs, the total surface area of 5,050 ha was slightly lower than the model estimate of 6,700 ha. Based on the aerial photographs, we estimated that only 600 ha of the 5,050 ha comprised isolated ponds, the remainder being water that drained to the Delta. For all but peak flood events, mean water depth remained less than 1 m (Figure 2B). During peak flood events, mean depths did not exceed 2 m except in February 1998. Water temperature showed gradual increases throughout each study year (Figure 2D).

Fish Habitat Use

We captured salmon in all regions of the floodplain and on all substrate types. During 1998–2000 flood events, salmon were captured in a high percentage of samples in each region (Figure 1) of the floodplain: (1) Fremont Weir (100%, n = 13 samples); (2) Cache Creek Sinks (50%, n = 16 samples); (3) Yolo Bypass Wildlife Area (77%, n = 22 samples); (4) Sacramento Bypass (100%, n = 7 samples); (5) Putah Creek Sinks (94%, n = 11 samples); and (6) Liberty Island (100%, n = 7 samples). Similarly, during 1998–2000 flood events we collected salmon on a high percentage of substrate types: (1) mud (70%, n = 47 samples); (2) sand (100%, n = 3 samples); (3) pavement (100%, n = 8 samples); (4) vegetation (97%, n = 32 samples); and 5) gravel (89%, n = 9 samples).

Salmon densities as estimated by purse seine sampling were not significantly different between riparian (mean abundance = 46.9/ha, SE = 10.4, n = 23), agricultural (mean abundance = 20.9/ha, SE = 6.1, n = 35), or natural vegetated habitat types (mean abundance = 27.5/ha, SE = 5.6, n = 31) based on a Kruskal–Wallis test (H = 4.38, df = 2, P = 0.112). There was also no statistically significant difference between the east (mean abundance = 29.5/ha, SE = 6.0, n = 53) and west (mean abundance = 29.9/ha, SE = 6.7, n = 36) sides of the Bypass as shown by a randomization t-test (P = 0.95). Salmon were collected in six hauls in low-velocity habitat (mean abundance = 189/ha, SE = 24/ha), but none were collected in adjacent areas exposed to a current.

Floodplain Migration Trends

Salmon migration as indicated by trends in screw trap catch was highly variable over the course of the study, but there were prominent peaks in Chinook salmon catch coincident with floodplain drainage during late March–April (Figure 3B). Additional smaller peaks in salmon catch also paralleled flow, mostly during February and March. The life history stage of salmon during 1998 was exclusively parr through the end of March, after which the majority showed signs of smoltification.

Floodplain Residence Time

Based on recoveries of tagged fish in the screw trap, the mean residence time of CWT salmon was 33 d (range, 16–46 d; n = 10) in 1998, 56 d (range, 4–76 d; n = 49) in 1999, and 30 d (range, 28–37 d; n = 25) in 2000. The size of fish was significantly larger (P<0.001; GLM) at the outlet of the floodplain than at the top (Figure 3C) during each of the study years.

Salmon Survival and Stranding

The numbers of CWT fish recovered for the Yolo Bypass were higher than in the Sacramento River in 1998, similar in 1999, and lower in 2000 (Table 1). Densities of wild Chinook salmon were highly variable during floodplain drainage events, with no statistically significant difference between densities in isolated earthen ponds and contiguous water sources (Table 2). However, densities of salmon were significantly higher (P < 0.0001; randomization t-test) in concrete weir scour ponds than in isolated earthen ponds (Table 3).

Discussion

Research on migratory fishes reveals that these species frequently have alternative life histories that may be influenced by habitat use at early life stages (Clark 1968; Secor 1999). Under Clark's (1968) "contingent hypothesis," migratory taxa have divergent migration pathways that could help the species deal with environmental variability and heterogeneity. This theory is consistent with our understanding of Chinook salmon, which are adapted to the extreme hydrologic variability in western North America and show a range of life histories (Healey 1991; Bottom et al. 2005). In this context, the use of multiple habitats—including natal and nonnatal streams (Bjornn 1971; Scriv-

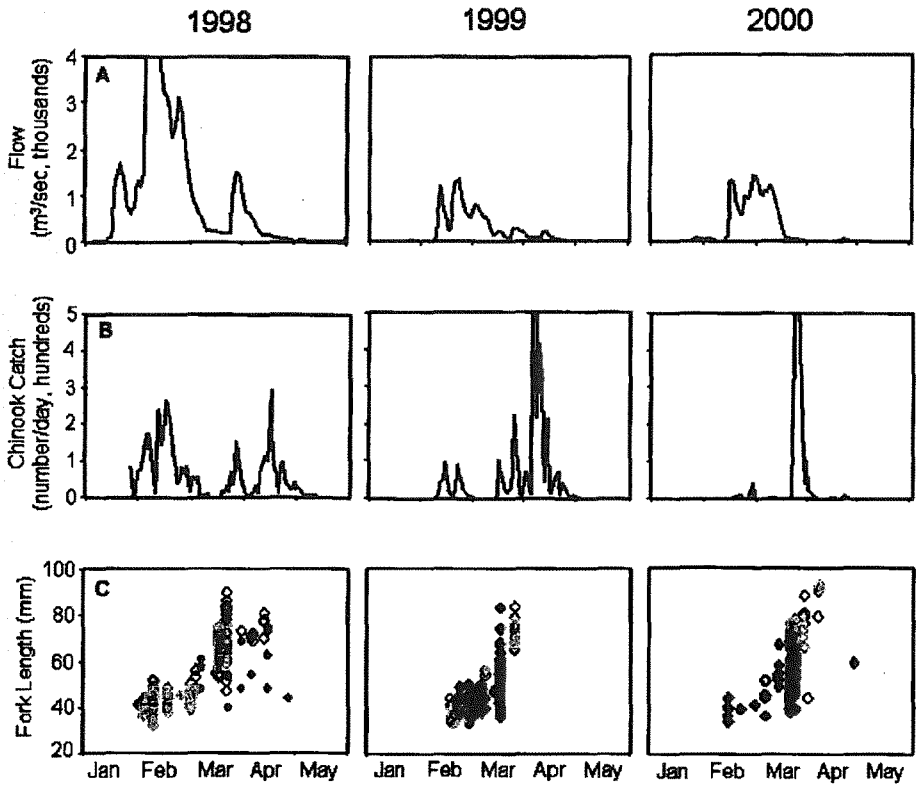

FIGURE 3.—Chinook salmon results during winter and spring 1998–2000: (A) mean daily flow; (B) salmon catch rates in screw trap sampling; and (C) salmon size for beach seine samples near the Yolo Bypass intake (solid symbols) and outlet (clear symbols).

ener et al. 1994), side channels and off-channel ponds (Swales et al. 1986; Swales and Levings 1989), low-elevation rivers (Kjelsen et al. 1982; Brown 2002), and estuaries (Healey 1991; Shreffler et al. 1992)—can be considered as part of an overall "bet-hedging" strategy that spreads risk across a variable environment. Despite the fact that seasonal floodplain represents perhaps the single most variable habitat available to salmon, our study suggests that floodplains are a viable rearing location for young fish.

TABLE 1.—Number of coded wire tags recovered in the ocean and commercial fisheries for Chinook salmon released in the Yolo Bypass and Sacramento River. The total number of tagged fish released in each location for each year is shown in parentheses. The survival ratio is calculated as the number of Yolo Bypass recoveries divided by the number of Sacramento River recoveries.

Release group	1998 (53,000)	1999 (105,000)	2000 (55,000)
Yolo Bypass	75	136	27
Sacramento River	35	138	47
Survival ratio	2.14	0.99	0.57

At the beginning of our study, our conceptual model for floodplain habitat use was that young salmon move into the floodplain during high-flow events and spread throughout the broad expanse of seasonally inundated habitat. Among the wide variety of suitable substrates and habitat types for rearing, young salmon appear to seek out low-velocity areas. Moreover, floodplain habitat apparently is not simply a migration corridor; many young salmon actively rear on the highly productive floodplain habitat for extended periods of time, resulting in high growth rates. Our findings suggest that salmon emigrate from the seasonally inundated habitat both during flood events and during drainage. Juvenile Chinook salmon do not appear to be especially prone to stranding mortality; indeed, survival may actually be enhanced by floodplain rearing in some years. Our conceptual model was supported by our results and has a variety of management implications.

Salmon were present in a broad range of habitat and substrate types and were collected in all regions and sides of the Yolo Bypass floodplain. The

TABLE 2.—Densities of Chinook salmon (number/ha ± SE, with sample size in parentheses) collected in beach seine sampling during drainage events in 1998–2000. The sample locations are divided into isolated earthen ponds and contiguous water sources. Density differences were not statistically significant between the two pond types based on a randomization *t*-test of the pooled data for all years ($P = 0.79$; $n = 43$ for isolated ponds; $n = 59$ for contiguous water sources).

Location type	1998	1999	2000
Isolated ponds	206 ± 112 (30)	890 ± 491 (8)	126 ± 65 (5)
Contiguous water sources	167 ± 79 (33)	310 ± 104 (13)	463 ± 123 (13)

fact that they were present on the western half of the Bypass, where flows are dominated by Knights Landing Ridge Cut and Cache and Putah creeks, suggests that salmon spread throughout the floodplain after entering the basin by way of Fremont and Sacramento weirs. A few of these fish may have originated from a modest spawning population in Putah Creek (Marchetti and Moyle 2001). The fact that salmon were present in a wide range of habitat and substrate types and in different regions of the Yolo Bypass indicates that many areas of habitat were suitable, although this does not mean that there were no habitat preferences. Like many young fishes, much of the distribution of juvenile Chinook salmon can be explained by their association with shallow depths and low velocities (Everest and Chapman 1972; Roper et al. 1994; Bradford and Higgins 2001). The physical modeling indicated that mean depths were generally 1 m or less during all but peak flood periods, so much of the thousands of hectares of inundated habitat was probably within the shallow range typically preferred by young Chinook salmon (Everest and Chapman 1972). Our limited purse seine sampling suggested that young salmon were most abundant in low-velocity areas, which is consistent with previous studies in river and stream habitat (Everest and Chapman 1972; Roper et al. 1994; Bradford and Higgins 2001). We did not directly simulate water velocity in the present study; however, the relatively shallow water depth during flood events reflects the broad area of low-velocity rearing habitat created during flood events. We expect that this increase in rearing habitat in the Yolo Bypass provides foraging opportunities (Sommer et al. 2001b), reduced energy expenditure, and perhaps reduced probability of encounter with a predator (Ward and Stanford 1995).

Our results also suggest that fish rear in the system for extended periods rather than simply using it as a migration corridor. The mean residence time of 30–56 d for the 44-km reach between the floodplain release location and the screw trap is substantially longer than one would expect, given that (1) fingerlings are capable of migrating at rates of at least 6–24 km/d in low-elevation reaches of other large rivers (Healey 1991) and (2) one of our 1999 CWT fish was recovered just 4 days after being released, having traveled an estimated rate of 11 km/d. The fish were significantly larger at the base of the Yolo Bypass, suggesting that their period of residence in the floodplain was long enough to support substantial growth. Similarly, Sommer et al. (2001b) found that salmon showed higher growth rates in the Yolo Bypass than in the adjacent Sacramento River, primarily because of higher levels of invertebrate prey in the floodplain. A long period of rearing is also supported by the screw trap data, which showed that the densities of salmon were greatest during drainage of the floodplain. We believe that these peaks are a result of rearing salmon being forced off of the floodplain by receding flows. Temperature and salmon life history stage do not provide good alternative explanations for the emigration trends. In 1998, for example, water temperatures were relatively high by late March and salmon began smoltification shortly thereafter; yet the screw trap data indicate

TABLE 3.—Densities of Chinook salmon (number/ha ± SE, with sample size in parentheses) collected in beach seine sampling for earthen ponds and adjacent concrete weir ponds. Density differences were statistically significant between the two pond types based on a randomization *t*-test of the pooled data for all years ($P < 0.0001$; $n = 26$ for each pond type). Note that we used a randomly sampled subset of the earthen pond data to provide equal sample sizes for the comparison.

Location type	1998	1999	2000
Earthen ponds	186 ± 67 (63)	531 ± 200 (21)	369 ± 97 (18)
Concrete weir ponds	2,717 ± 1,115 (14)	14,208 ± 3,898 (12)	4,181 ± 1,275 (3)

that emigration did not peak until the end of April, when the floodplain drained. Perhaps the emigration trends are partially confounded by seasonal variation in salmon abundance. In the absence of trap efficiency data, we cannot estimate the proportion of the population that emigrated in winter versus spring events.

Several lines of evidence suggest that the majority of fish successfully emigrated from the floodplain. One important observation was that the area of isolated ponds was small relative to the overall area of the floodplain during both peak flood and drainage periods. As an example, in 1998, the wettest year we studied, the peak area of inundation was 24,000 ha, but the total inundated area dropped to 5,000 ha by late April. Of the 5,000 ha remaining at this point, our estimates from aerial photographs showed that isolated ponds took up only 600 ha. Put another way, isolated ponds represented just 12% of the wetted area in April and only 2.5% of the peak inundated area in winter. The same trend is evident in the area simulations for 1999 and 2000, when the peak area was 20,000 ha, but dropped to about 2,000 ha within a month. These results demonstrate that the Yolo Bypass drains fairly efficiently, leaving little isolated area where stranding can occur. This finding was somewhat unexpected, because many parts of the Yolo Bypass have natural topographic features or agricultural levees that could potentially impede drainage and fish emigration. Even if the area of isolated ponds is low, stranding could still be a substantial source of mortality if densities of fish in the remaining ponds were very high. However, we found no evidence that densities of fish stranded in isolated ponds were significantly higher than those in contiguous water sources that were draining to the Delta. The key point here is that most of the water drains from the floodplain and apparently the majority of the fish are leaving with the receding floodwaters. To help illustrate this issue, if we assume that mean densities of fish observed in Table 2 were representative of the entire wetted area of floodplain in April 1998, then the total number of fish in the 600 ha of isolated ponds would have been 123,600 salmon, lower than an estimate of 835,000 fish in the 5,000 ha of contiguous water sources. This conservative estimate also does not include the large numbers of fish that emigrated from the floodplain before April.

In addition to the beach seine and surface area data, we believe that trends in screw trap data support the hypothesis that stranding is not consistently a major problem on the floodplain. The screw trap data are somewhat ambiguous, because the large area of the floodplain makes it unreasonable to measure the efficiency of the trap. Therefore, we cannot accurately estimate the absolute number of salmon emigrating from the floodplain. However, we can at least examine the patterns of trap catch to evaluate likely mechanisms. Some of the possible patterns that we would expect to see for different factors are summarized in Figure 4. First, under the "trap efficiency" model, we would have expected dual peaks in the earliest and latest portions of flood events, when the screw trap would be sampling the highest portion of total flow (Figure 4A). If young salmon follow the "go with the flow" model, catch and flow peaks should be well-correlated (Figure 4B). Alternatively, if floodplains represent an important rearing habitat, we would expect catch trends to follow the "loitering" model, in which catch does not increase until drainage, when fish are forced from their rearing habitat by receding floodwaters (Figure 4C). Finally, if stranding were a major factor controlling catch trends, we would expect an early increase in catch as fish moved through the floodplain during inundation, but then catch should drop earlier than flow as young salmon became isolated from draining floodwaters (Figure 4D; "bathtub" model). Of these patterns, our data for the Yolo Bypass provide the strongest support for both the "go with the flow" and "loitering" models. In each year we saw obvious screw trap catch peaks associated with flow events, and additional prominent peaks associated with drainage. To summarize, apparently some of the fish move

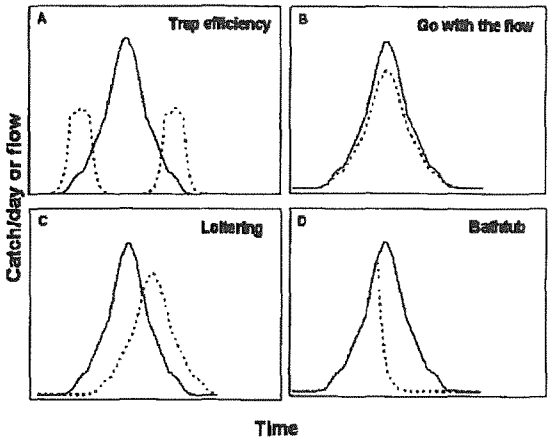

FIGURE 4.—Four conceptual models of expected screw trap catch (dotted line) relative to flow (solid line). See the Discussion for further details about each model.

through the floodplain in direct association with flow, whereas others remain as long as possible to rear on the floodplain. The screw trap trends show no evidence that stranding had a major influence on patterns of emigration.

Relatively low stranding rates on the Yolo Bypass floodplain are supported by observations from other seasonal floodplain habitat in the San Francisco estuary (Peter Moyle, University of California–Davis, personal communication) and other studies. Higgins and Bradford (1996) and Bradford (1997) report that juvenile salmonids are relatively mobile and that most avoid being stranded during moderate rates of stage change. Higgins and Bradford (1996) state that maximum recommended stage reduction levels for gravel bars of regulated rivers are typically 2.5–5 cm/h, much more than the 1 cm/h or less rates of change in mean water depth we observed during drainage in the present study. In his review of the ecology of fishes in floodplain rivers, Welcomme (1979) noted that the majority of fish emigrate from floodplain habitat during drainage.

Even if stranding is not a major source of mortality, this does not necessarily mean that floodplains are not sinks for salmon production. Of the possible sources of mortality, birds and piscivorous fishes may have benefited from stranded salmon (Brown 2002). As noted by Sommer et al. (2001a), major avian predation is unlikely because densities of wading birds are low relative to the thousands of hectares of rearing habitat available during flood events. We did not measure densities of fish predators, but believe that the creation of large areas of rearing habitat should create more refuges for young fish and decrease the probability of encounter with a predator.

Ultimately, it is survival data that allow us to differentiate source from sink habitat. The size and complexity of the San Francisco estuary made it very difficult to directly measure survival rates with statistical rigor (Newman and Rice 2002); however, our CWT release studies at least provide an indication of whether survival rates in the Yolo Bypass were substantially different from those in the Sacramento River, the adjacent migration corridor. The limited results suggest that fry–adult survival rates were at least comparable in the Yolo Bypass and the Sacramento River. Moreover, the 1998 results suggest that in some years, survival may actually be substantially higher for salmon that migrate through the floodplain. Although none of these CWT releases were replicated, the fact that Sommer et al. (2001b) reported similar results for fry-to-smolt survival for the same releases in 1998 and 1999 increases our confidence that the survival data are not spurious.

Our data indicate that floodplains are a viable rearing habitat for juvenile Chinook salmon. Hence, the most important management implication of our study is that seasonal habitat should be considered as part of restoration plans for this species. Despite frequent concerns that off-channel habitat could increase stranding mortality (Brown 2002; Bruce Oppenheim, NOAA Fisheries, personal communication), our results for a hydrologically variable seasonal floodplain suggest that one should be able to design restoration projects that do not create a population sink because of excessive mortality. This is not to say, however, that stranding mortality is never an issue on floodplain habitat. For example, in the Yolo Bypass we saw significantly higher stranding rates in the concrete weir scour ponds of Fremont and Sacramento weirs than in earthen ponds. This finding suggests that artificial water control structures can create unusual hydraulics that promote stranding. However, the total area of these concrete weir ponds was only 3 ha, much smaller than our estimate of 600 ha for total isolated pond area for April 1998 and insignificant compared with the peak inundated area of 24,000 ha area. Fixing the poor hydraulics at these water-control structures may, nonetheless, be an attractive option, particularly if the cost of the solution is relatively low or if it helps to address other fisheries issues such as adult fish passage. In the Yolo Bypass, the concrete weirs not only create stranding problems for juveniles but also frequently block upstream passage of adult salmon, sturgeon, and steelhead trout (Sommer et al. 2001a), thus creating an incentive to resolve both issues simultaneously.

Finally, we wish to acknowledge that even natural floodplain or well-designed restored floodplain habitat could at least occasionally be a population sink because of stranding or predation losses. Our study was conducted over 3 years for a single, large floodplain; we cannot rule out the possibility that floodplains may not have net benefits in other years or locations. As an example, fish densities in the Yolo Bypass were relatively low compared with those reported in some other studies (Levy and Northcote 1982; Swales et al. 1986; Swales and Levings 1989); perhaps young salmon behavior could be different at higher densities. However, the potential for such losses can still be consistent with effective management of salmon populations. Diverse life history strategies

provide bet-hedging for salmon populations in the highly variable environment of coastal tributaries (Secor 1999; Bottom et al. 2005). We therefore expect that young salmon will not thrive in all habitats in every year. In the case of highly variable seasonal environments such as floodplains, stranding losses might cause excessive mortality in some years, but the risks may be offset by increased rearing habitat and food resources in other years (Sommer et al. 2001b; Brown 2002).

Acknowledgments

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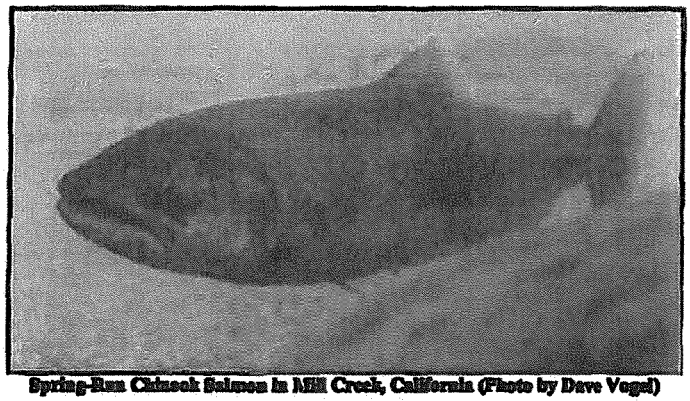
Insights into the Problems, Progress, and Potential Solutions for Sacramento River Basin Native Anadromous Fish Restoration



Spring-Run Chinook Salmon in Mill Creek, California (Photo by Dave Vogel)

April 2011

Prepared for:

Northern California Water Association
and
Sacramento Valley Water Users

Prepared by:

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Attachment M

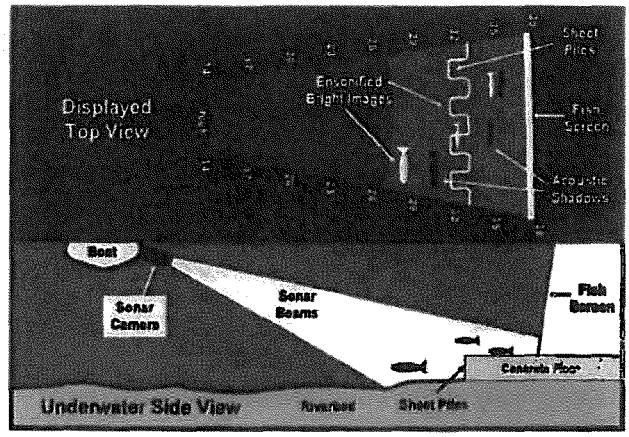


Figure 60. Schematics of DIDSON™ imaging at the base of a flat-plate fish screen. Bottom diagram shows orientation of sonar beams from the acoustic camera off the side of a boat and submerged objects at the fish screens. Top diagram shows the resultant corresponding sonar imaging of objects ensonified with acoustic shadows from the objects. (from Vogel 2008b)

From 1996 through 2010, Natural Resource Scientists, Inc. conducted 22 separate research projects on juvenile salmon (including four studies of predatory fish) in the Delta using acoustic or radio telemetry as a means to gain an improved understanding of fish movements and mortality (Vogel 2010a). The reason juvenile salmon telemetry studies were initiated in the Delta was to acquire detailed data on fish behavior, fish route selection through complex channels, and estimate fish survival in discrete reaches. Past efforts using traditional coded-wire tagging could not answer those critically important questions. Research findings from the telemetry investigations indicate that smolt survival assumptions and models must incorporate these new conclusions to avoid misinterpretation of data and improve quantitative estimates of fish survival and movements (Vogel 2010a).

The first successful use of telemetry on juvenile salmon in the Central Valley was conducted by Natural Resource Scientists, Inc. on behalf of EBMUD in 1996 and 1997. At that time, the specific behavior of juvenile salmon in the Delta was largely unknown. The initial studies quickly determined that the fish did not move as a school, but instead, dispersed, exhibiting a wide range in migratory behaviors in the complex Delta environment. Salmon moved many miles back and forth each day with the ebb and flood tides and the side channels (where flow was minimal) were largely unused. Site-specific hydrodynamic conditions present at flow splits when the fish arrived had a major affect in initial route selection. Importantly, some of the salmon were believed to have been preyed upon based on very unusual behavior patterns (Vogel 2010a).

Subsequent, additional juvenile salmon telemetry studies were conducted by Natural Resource Scientists Inc. on behalf of the USFWS and CALFED in the north Delta (Vogel 2001, Vogel 2004). Triangulating radio-tagged fish locations in real time (Figure 61) clearly demonstrated

how juvenile salmon move long distances with the tides and were advected into regions with very large tidal prisms, such as upstream into Cache Slough and into the flooded Prospect and Liberty Islands (Figure 62). During the studies, it was determined that some radio-tagged salmon were eaten by predatory fish in northern Cache Slough, near the levee breaches into flooded islands (discussed below). Also, monitoring telemetered fish revealed that higher predation occurred in Georgiana Slough as compared to the lower Sacramento River (Figure 63). As discussed previously, past coded-wire tagging studies found that salmon released into northern Georgiana Slough were found to have a higher mortality rate than fish released downstream of the slough in the Sacramento River (Brandes and McLain 2001).

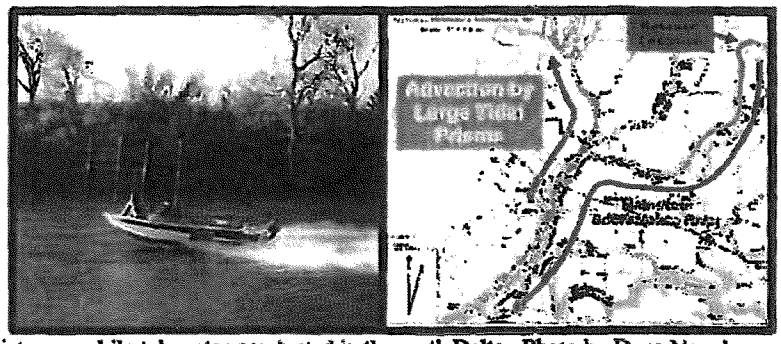


Figure 61. Left picture, mobile telemetry conducted in the north Delta. Photo by Dave Vogel.
Figure 62. Right picture, telemetered locations of approximately 100 radio-tagged salmon smolts released in the lower Sacramento River near Ryde (data from Vogel 2001 and Vogel 2004).

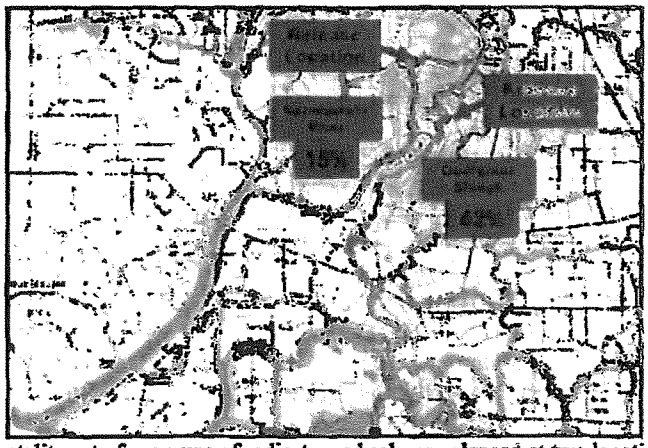
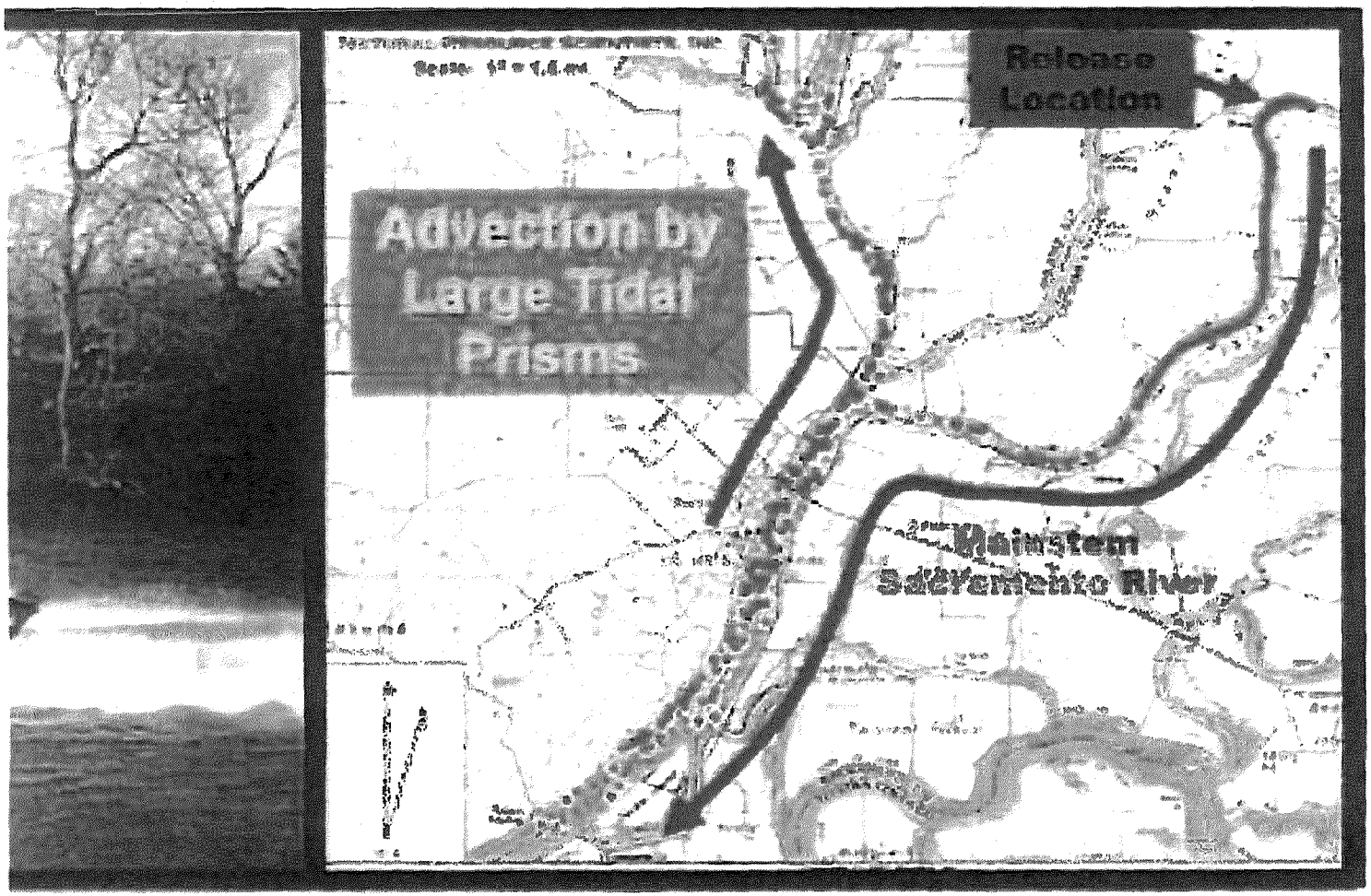


Figure 63. Estimated mortality rate for groups of radio-tagged salmon released at two locations in the north Delta and locations where radio-tagged salmon smolts were detected to have been preyed upon (Vogel 2001, Vogel 2004).

More recently, a 2007 study conducted by releasing acoustic-tagged juvenile salmon in the San Joaquin River found 116 motionless juvenile salmon transmitters in the lower San Joaquin River near the Stockton Waste Water Treatment Plant and a nearby bridge (Figure 64) (Vogel 2007b). This was an all-time record for the largest number of dead radio- or acoustic-telemetered juvenile



.ducted in the north Delta. Photo by Dave Vogel.

ıs of approximately 100 radio-tagged salmon smolts released in the

vegetation at some sites in the Delta and water clarity. Increased water clarity for sight predators such as black bass and striped bass would presumably favor predatory fish over prey (*e.g.*, juvenile salmon). Fewer native fish species are found in *Egeria* stands compared to introduced fish species (Grimaldo and Hymanson 1999). Additionally, it has been hypothesized that high densities of *Egeria* in portions of the Delta may restrict juvenile salmon access to preferred habitats, forcing salmon to inhabit deep water or channel areas where predation risks may be higher (Grimaldo *et al.* 2000).

During recent years, there has been an emphasis to reclaim or create shallow, tidal wetlands to assist in re-recreating the form and function of ecosystem processes in the Delta with the intent of benefitting native fish species (Simenstad *et al.* 1999). Among a variety of measures to create such wetlands, Delta island levees either have been breached purposefully or have remained unrepaired so the islands became flooded. A recent example is the flooding of Prospect Island which was implemented under the auspices of creating shallow water habitat to benefit native fish species such as anadromous fish (Christophel *et al.* 1999). Initial fish sampling of the habitat created in Prospect Island suggested the expected benefits may not have been realized due to an apparent dominance of non-native fish (Christophel *et al.* 1999). Importantly, a marked reduction of sediment load to the Delta in the past century (Shvidchenko *et al.* 2004) has implications in the long-term viability of natural conversion of deep water habitats on flooded Delta islands into shallow, tidal wetlands. The very low rates of sediment accretion on flooded Delta islands indicate it would take many years to convert the present-day habitats to intertidal elevations which has potentially serious implications for fish restoration (Nobriga and Chotkowski (2000) due to likely favorable conditions for non-salmonid fish species that can prey on juvenile salmon. Studies of the shallow water habitats at flooded Delta islands showed that striped bass and largemouth bass represented 88 percent of the individuals among 20 fish species sampled (Nobriga *et al.* 2003).

There have likely been significant adverse, unintended consequences of breaching levees in the Delta. There is a high probability that site-specific conditions at the breaches have resulted in hazards for juvenile anadromous fish through the creation of favorable predator habitats. The breaches have changed the tidal prisms in the Delta and can change the degree in which juvenile fish are advected back and forth with the tides (Figure 61; previously discussed). Additionally, many of the breaches were narrow which have created deep scour holes favoring predatory fish. Sport anglers are often seen fishing at these sites during flood or ebb tides. Breaching the levees at Liberty Island is an example (Figure 72 and 73). Recent acoustic-tagging of striped bass in this vicinity confirmed a high presence of striped bass (Figure 74, D. Vogel, unpub. data).

Figure 72. Liberty Island in the north Delta before and after flooding.

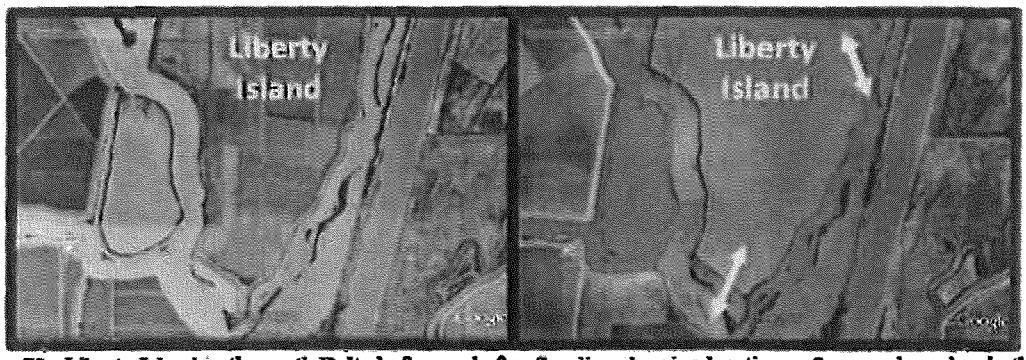


Figure 73. Liberty Island in the north Delta before and after flooding showing locations of narrow breaches in the levee.

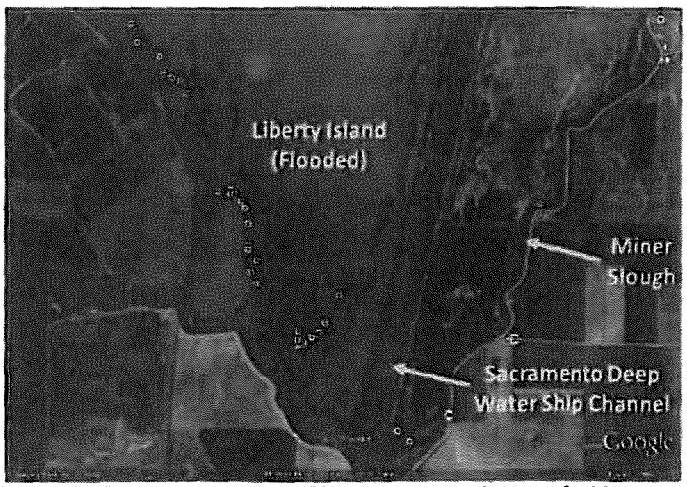


Figure 74. Locations (squares) where predatory striped bass were acoustic-tagged with transmitters during the winter of 2008 – 2009 in the north Delta near Liberty Island (D. Vogel, unpublished data).

TABLE A-5
1976-77 Estimated Crop Et Values
Delta Service Area
(in inches)

Land Use Category	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Total Oct.76-Sep.77	Oct. 77	Total Nov.77-Oct.77
Sacramento-San Joaquin Delta															
Irrigated Pasture	3.2	1.5	1.0	0.7	1.5	3.6	5.4	4.8	6.9	7.7	6.4	4.7	47.4	3.4	47.6
Alfalfa	3.2	1.5	1.0	0.7	1.5	3.2	4.9	4.4	6.5	7.5	6.5	4.9	45.8	3.4	46.0
Deciduous Orchard (Fruits & Nuts)	2.6	1.5	1.0	0.7	1.5	2.7	3.8	4.0	6.1	7.4	6.1	4.3	41.7	2.6	41.7
Tomatoes	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.6	4.0	8.2	6.0	2.3	34.3	1.9	33.8
Sugar Beets	2.4	1.5	1.0	0.7	1.5	1.9	2.2	3.7	7.6	8.3	6.4	4.4	41.6	2.4	41.6
Grain Sorghum (Milo)	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.0	5.9	7.3	4.3	2.5	33.2	1.9	32.7
Field Corn	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.3	5.7	6.9	5.1	2.6	33.8	1.9	33.3
Dry Beans	2.4	1.5	1.0	0.7	1.5	1.9	2.2	1.7	5.7	6.2	2.7	2.5	30.0	1.9	29.5
Safflower	2.4	1.5	1.0	0.7	1.5	1.9	2.5	4.8	8.7	7.7	4.4	2.5	39.6	1.9	39.1
Asparagus	2.4	1.5	1.0	0.7	1.5	1.9	2.2	1.0	3.5	7.7	6.4	4.7	34.5	2.4	34.5
Potatoes	2.4	1.5	1.0	0.7	1.5	1.9	2.2	1.7	4.3	7.4	5.5	2.8	32.9	1.9	32.4
Irrigated Grain	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	1.0	1.0	1.6	26.1	1.6	24.7
Vineyard	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.8	5.3	6.5	5.3	3.4	34.5	2.4	34.5
Rice	3.2	1.5	1.0	0.7	1.5	1.9	2.8	5.6	8.8	9.8	8.1	5.5	50.4	3.4	50.6
Sudan	2.4	1.5	1.0	0.7	2.0	4.3	5.7	4.8	6.9	7.7	4.9	4.7	46.6	2.4	46.6
Misc. Truck	2.4	1.5	1.0	0.7	1.5	1.9	3.2	4.6	6.7	7.4	5.2	3.7	39.8	1.9	39.3
Misc. Field	2.4	1.5	1.0	0.7	1.5	1.9	2.2	2.4	6.1	7.4	5.0	1.9	34.0	1.9	33.5
Double Cropped with Grain															
Sugar Beets	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	4.2	5.2	5.8	37.7	3.4	38.7
Field Corn	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	4.3	6.3	6.1	39.2	2.7	39.5
Grain Sorghum (Milo)	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	1.8	2.7	6.1	5.2	36.5	1.9	36.0
Sudan	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	3.6	7.7	4.9	4.7	41.6	1.9	41.1
Dry Beans	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	3.1	7.6	3.5	1.5	36.4	1.9	35.9
Tomatoes	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	2.3	6.6	6.0	5.2	40.8	1.9	40.3
Lettuce	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	4.1	7.4	5.3	4.9	42.4	2.4	42.4
Misc. Truck	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	2.3	6.6	6.0	5.2	40.8	2.4	40.8
Misc. Field	2.4	1.5	1.0	0.7	2.0	4.3	5.7	3.1	4.1	7.4	5.3	4.9	42.4	3.4	43.4
Fallow Lands 1/	2.4	1.5	1.0	0.7	1.4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	14.0	1.0	12.6
Native Vegetation 2/	2.4	1.5	1.0	0.7	1.4	3.7	3.8	2.1	2.3	2.6	2.3	2.0	25.8	1.6	25.0
Riparian Veg. & Water Surface	4.6	2.4	1.4	0.8	1.9	4.5	7.4	6.6	9.7	11.8	9.7	7.0	67.8	4.3	67.5
Urban	1.6	0.8	0.6	0.7	1.0	1.0	1.9	2.4	2.4	2.5	2.4	1.9	19.2	1.6	19.2

1/ Applies also to nonirrigated grain.
2/ Applies also to nonirrigated orchards and vineyards

Metric conversion: inches times 25.4 equals millimetres.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

PUBLICATIONS OF THE
DIVISION OF WATER RESOURCES
EDWARD HYATT, State Engineer

S A C R A M E N T O - S A N J O A Q U I N

W A T E R S U P E R V I S O R ' S

R E P O R T

FOR YEAR

1 9 3 1

By
HARLOWE M. STAFFORD
Water Supervisor

Under the supervision of
HAROLD CONKLING
Deputy State Engineer

August, 1932

Attachment O

TABLE 69

UNIT CONSUMPTIVE USE OF WATER IN SACRAMENTO-SAN JOAQUIN DELTA**
Acre-feet per Acre

Crop or Classification	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total Seasonal Use	Total Annual Use
Alfalfa	(.06)	(.08)	.10	.30	.40	.50	.65	.55	.50	.20	(.10)	(.07)	3.20	3.51
Asparagus	.05	.05	.05	.05	.08	.14	.40	.68	.55	.42	.12	.10	2.69	2.69
Beans	(.06)	(.08)	(.08)	(.16)	(.20)	.14	.24	.58	.37	(.09)	(.07)	(.05)	1.33	2.12
Beets	(.06)	(.08)	(.08)	.13	.32	.51	.61*	.53*	.20*	(.13)	(.10)	(.07)	2.30	2.82
Celery	(.04)	(.04)	(.04)	(.08)	(.10)	.10	.10	.20	.25	.30	.20	.05	1.20	1.50
Corn	(.04)	(.04)	(.04)	(.08)	(.10)	.24	.85	.84*	.40*	.10	(.10)	(.07)	2.43	2.90
Fruit	(.04)	(.04)	(.04)	.18	.32	.50	.57	.40	.23	.07	(.07)	(.05)	2.27	2.82
Grain and Hay	(.04)	(.04)	.07	.60	.83	.20	(.14)	(.23)	(.21)	(.14)	(.07)	(.05)	1.70	2.62
Onions	(.04)	(.04)	.08	.13	.27	.49	.43	.20	(.16)	(.13)	(.10)	(.07)	1.60	2.14
Pasture	.08	.10	.20	.25	.25	.25	.25	.25	.20	.15	.10	.08	2.16	2.16
Potatoes	(.06)	(.08)	(.08)	(.16)	.15	.38	.52	.30	.15	(.09)	(.07)	(.05)	1.50	2.09
Seed	(.06)	(.08)	(.08)	.10	.25	.50	.50	.50	.35	.10	(.10)	(.07)	2.30	2.69
Truck	(.06)	(.08)	.10	.10	.25	.50	.45	.45	.30	.15	.10	(.07)	2.40	2.61
Tules	.16	.09	.30	.74	1.10	1.28	1.53	1.32	1.18	.98	.59	.36	9.63	9.63
Willows	.05	.03	.09	.22	.33	.38	.46	.40	.35	.29	.18	.10	2.88	2.88
Bare Land	.04	.04	.04	.08	.10	.13	.14	.13	.11	.09	.07	.05	1.02	1.02
Idle Land with Weeds***	.06	.08	.08	.16	.20	.26	.28	.24	.16	.13	.10	.07	1.82	1.82
Open Water Surfaces	.08	.13	.23	.34	.60	.76	.84	.73	.60	.33	.14	.08	4.91	4.91

NOTE: Figures shown in brackets ( ) represent estimated consumptive use on cropped areas before planting and after harvest. (Evaporation from bare land, use by weeds, etc.).

* Includes estimated additional use by weeds during these months.

** These are the data as determined for and published in Bulletin No. 27 - "Variation and Control of Salinity in Sacramento-San Joaquin Delta and Upper San Francisco Bay" - Table 1.

*** Average for land below elevation 5.0 U.S.G.&S. datum. Use on unirrigated lands above elevation 5.0 is considered zero.

TABLE 74

USE OF WATER BY CAT-TAILS GROWN IN TANKS, NEAR CLARKSBURG, RECLAMATION DISTRICT 999, 1931

TANK NO.	USE OF WATER — ACRE-FEET PER ACRE												
	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	YEAR
2	0.22	0.22	0.58	1.08	2.28	2.28	2.96	2.51	1.66	0.91	0.43	0.23	15.36
3	0.21	0.20	0.49	1.12	1.94	2.11	2.51	1.92	1.36	0.83	0.51	0.22	13.42
4	0.20	0.21	0.52	1.30	2.51	2.78	3.34	2.78	1.90	1.04	0.54	0.29	17.41
5	0.23	0.25	0.50	1.15	1.98	1.83	2.04	1.82	1.28	0.76	0.37	0.13	12.34
6	0.22	0.24	0.60	1.44	2.80	2.77	3.51	—UNDER TEST FOR LEAKAGE—					
MEANS	0.22	0.22	0.54	1.22	2.30	2.35	2.87	*2.26	*1.55	*0.94	*0.46	*0.22	*14.63

*MEAN OF FOUR TANKS

TABLE 75

USE OF WATER BY TULES GROWN IN TANKS, NEAR CLARKSBURG, RECLAMATION DISTRICT 999, 1931

TANK NO.	USE OF WATER — ACRE-FEET PER ACRE												
	JAN.	FEB.	MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	NOV.	DEC.	YEAR
7	0.21	0.23	0.54	1.32	3.02	2.88	4.35	—UNDER TEST FOR LEAKAGE—					
8	0.20	0.24	0.48	1.18	2.45	2.39	3.02	2.59	1.78	1.01	0.51	0.20	16.05
9	0.20	0.26	0.48	1.12	2.14	2.20	2.76	1.98	1.37	0.82	0.41	0.20	13.94
10	0.19	0.24	0.51	1.08	2.07	2.26	2.88	1.71	1.23	0.66	0.43	0.23	13.49
11	0.21	0.19	0.40	0.90	1.84	1.65	1.63	1.32	1.16	0.72	0.39	0.19	10.60
12	0.20	0.20	0.25	0.84	1.75	1.26	2.75	2.36	1.72	1.09	0.61	0.27	13.30
MEANS	0.20	0.23	0.44	1.07	2.21	2.11	2.90	*1.99	*1.45	*0.86	*0.47	*0.22	*13.48

*MEAN OF FIVE TANKS

TABLE 77
USE OF WATER BY CAT-TAIS AND TULES GROWN IN TANKS AT CAMP 3, KING ISLAND
1931

UOW = Use of Water – Acre-feet Per Acre

NUR = No Usable Record

Tank Number	Plant	Water Surface Above Ground Surface Feet	UOW Jan	UOW Feb	UOW Mar	UOW Apr	UOW May	UOW Jun	UOW Jul	UOW Aug	UOW Sep	UOW Oct	UOW Nov	UOW Dec (3)	UOW Year (4)	Compara-tive Plant Size (2)
1	Cat-tails	0.0	0.14	0.13	0.25	0.52	0.52	0.31	0.33	0.18	0.13	0.15	0.07	-	2.8	Undersize
2	Cat-tails	1.0	NUR	NUR	NUR	-	(1) 0.72	0.82	0.92	0.82	0.67	0.53	0.26	-	6.2	Undersize
3	Tules	1.0	NUR	NUR	NUR	-	(1) 1.33	1.13	1.32	1.16	0.80	0.51	0.19	-	8.0	Normal
4	Tules	0.0	0.17	0.15	0.45	0.58	1.00	0.88	0.88	0.71	0.53	0.15	0.07	-	5.7	Undersize

(1) Includes April 29th and 30th
(2) The comparison for size is with surrounding patch plants of the same kind. Plants in Tanks Numbers 1 and 2 were undersize all season. Plants in Tank Number 4 were normal size at beginning of season.
(3) Heavy rains deranged conditions so that no reliable record for December was obtained.
(4) Estimated. Closely for Tanks Numbers 1 and 4. Roughly for Tanks Number 2 and 3.

-0-

Tank Number	Water Surface Above Ground Surface Feet	UOW Jan	UOW Feb	UOW Mar	UOW Apr	UOW May	UOW Jun	UOW Jul	UOW Aug	UOW Sep	UOW Oct	UOW Nov	UOW Dec	UOW Year (Approx)	Number of Stalks in July*
1	1.0	0.11	0.15	0.23	0.28	0.38	0.48	0.61	0.48	0.43	0.21	0.11	(0.11)	3.58	11
2	0.0	(0.11)	(0.11)	(0.12)	0.14	0.94	0.80	0.69	0.52	0.36	0.22	0.11	(0.11)	4.23	19
3	1.0	(0.11)	(0.15)	(0.28)	0.34	1.01	0.87	0.84	0.67	0.60	0.46	0.29	(0.11)	5.73	35
4	0.0	(0.11)	(0.15)	(0.24)	0.29	0.96	0.89	0.78	0.59	0.54	(0.30)	0.14	(0.11)	5.10	30
Means	-	(0.11)	(0.4)	(0.22)	0.26	0.82	0.76	0.73	0.57	0.48	(0.30)	0.16	(0.11)	4.66	-

Note: Figures in parentheses are estimated.
* There were some new sprouts in all tanks in July

Coalition for a Sustainable Delta

March 30, 2022

Maria Camille Calimlim Touton
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Re: Notice of Intent to Prepare an Environmental Impact Statement on the Long-Term Operation of the Central Valley Project and State Water Project, 87 Fed. Reg. 11,093 (Feb. 28, 2022)

Dear Commissioner Touton:

The Coalition for a Sustainable Delta ("Coalition") is writing to provide input with respect to the Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) on Long-Term Operations of the California State Water Project (SWP) and the Central Valley Project (CVP) published by to the Bureau of Reclamation (Reclamation) in the Federal Register on February 28, 2022. The Coalition is a California nonprofit corporation comprised of agricultural, municipal, and industrial water users, as well as individuals in the San Joaquin Valley. The Coalition and its members depend on water from the Sacramento-San Joaquin Delta (Delta) for their continued livelihood. Individual Coalition members frequently use the Delta for environmental, aesthetic, and recreational purposes. The economic and non-economic interests of the Coalition and its members are dependent on a healthy and sustainable Delta ecosystem.

Purpose and Need

The NOI describes the project purpose and need. The Council on Environmental Quality (CEQ) regulations to implement the National Environmental Policy Act (NEPA) require inclusion of the purpose and need in an Environmental Impact Statement (EIS). 40 C.F.R. § 1502.13. But Reclamation does not plainly state that these multiple-use water projects are primarily water supply projects paid for by local water agencies with long-term water supply contracts with Reclamation and the California Department of Water Resources. Acknowledgement of this fact is important because the scope of the project purpose and need influence the range of alternatives that Reclamation should consider in preparing its EIS.

Alternatives Analysis

> The NOI states, with respect to the alternatives to be analyzed:
>
> The EIS will consider a range of reasonable alternatives, consistent with 40 CFR 1502.14, including a No Action Alternative that would continue implementation of the 2020 ROD. Reasonable alternatives may include combinations of operation of CVP and SWP facilities and diversions, construction actions, habitat restoration, conservation hatchery practices, and monitoring and special studies.

87 Fed. Reg. at 11,094. We agree with Reclamation that given the size and complexity of the SWP and CVP, it is appropriate to consider alternatives that vary operations as well as non-operational measures. Doing so in a manner that will allow the agency to mix and match components affords the agency latitude to select an alternative from among those analyzed that is consistent with the purpose and need and has the greatest overall benefits relative to costs. Components that should be analyzed during the environmental review process are:

- Inclusion of alternative Shasta cold-water pool management strategies to protect winter-run Chinook salmon while minimizing water supply losses. For example, providing the coldest water during the last half of the egg incubation period (when eggs are most sensitive to water temperature), rather than attempting to provide the coldest water from the very beginning of egg incubation.

- Collaboration with the State to alter existing Chinook salmon and steelhead hatchery practices in ways that would benefit wild populations of these species. For example, current practices that do not include sufficient natural origin fish in hatchery brood stock and allow excess hatchery-produced fish to spawn in-river are impairing the productivity and fitness of remaining wild-origin populations.

- Collaboration with the State to modify existing ocean harvest regulations to better protect spring-run Chinook, winter-run Chinook, and wild (non-hatchery origin) fall-run Chinook salmon. Current ocean harvest management is reasonably protective of winter-run Chinook maturing at age-3, but it inadequately protects fish maturing at age-4 or older. Improved harvest management strategies might include maximum harvest quotas for sensitive stocks.

- Inclusion of broader non-native predator control strategies to benefit smelt and salmonids. This could be accomplished by changing recreational harvest regulations to encourage harvest of size classes and species of predators most likely to prey upon smelt and salmonids.

- Inclusion of more relaxed storm-flex and risk-based provisions during high flow periods to provide water supply benefits without causing population-level adverse effects on smelt and salmonids.

- Elimination of a summer-fall outflow action to provide water supply benefits without causing population-level adverse effects on delta smelt.

- Restoration of tidal marshlands to enhance food supplies and mediate temperature conditions to benefit smelt.

- Development of flow-through managed wetlands in Suisun Marsh and Grizzly Island to substantially increase food production for smelt in Suisun Marsh, Honker Bay and northern Suisun Bay.

- Substantially more inundation of Yolo bypass than would be achieved by the "Big Notch" project.

At the same time, the Coalition recommends against combining analysis of ongoing operations of the SWP and CVP with other, distinct water storage and/or supply projects.

Impact Analysis

Impacts analysis is at the heart of the environmental review process. 42 U.S.C. § 4332(C)(1); 40 C.F.R. § 1502.16. Done properly, impacts analysis is a stepwise, structured process. Across all alternatives analyzed, impacts analysis should explicitly acknowledge that the components that make up the project being analyzed will be developed and implemented in an adaptive resource management framework, following the guidelines and best practices described as essential to linking science with improved decision-making in B.K. WILLIAMS ET AL., ADAPTIVE MANAGEMENT: THE U.S. DEPARTMENT OF THE INTERIOR TECHNICAL GUIDE (2007).

Outcomes from use of the structured decision-making to analyze components (or actions) included in the alternatives can be very different when alternatives are implemented in an adaptive management framework accompanied by monitoring designed to service adaptive management versus the traditional command-and-control implementation of actions absent monitoring designed to assess the performance of the action. The approach to adaptive management described in J.C. FISCHENICH ET AL., A SYSTEMS APPROACH TO ECOSYSTEM ADAPTIVE MANAGEMENT: A USACE TECHNICAL GUIDE (2019) operationalizes the Department of the Interior Technical Guidance and clarifies that certain management actions may not require implementation in an adaptive framework. A more detailed step-down procedure and process that may be appropriate to the scale and substance of proposed impacts analysis across alternatives can follow D.D. Murphy & P.S. Weiland, "Science and structured decision making: Fulfilling the promise of adaptive management for imperiled species," 4 JOURNAL OF ENVIRONMENTAL STUDIES AND SCIENCES 200–207 (2014) (see tables 3 and 4).

Impact analysis should also include consideration of socioeconomic effects. In this regard, we urge Reclamation to give careful consideration to overall costs and benefits and select an action from among the alternatives that has the most favorable ratio of costs to benefits.

Doing so is consistent with public policy. *E.g.*, CASS SUNSTEIN, THE COST-BENEFIT REVOLUTION (2018).

Role of Monitoring

Fish and Wildlife Service and US Geological Survey scientists J.E. Lyon et al. in "Monitoring in the context of structured decision-making and adaptive management," 72 JOURNAL OF WILDLIFE MANAGEMENT 1683–1692 (2008), observe that "monitoring is a crucial component of an informed process for making decisions." For this reason and because it is a requirement of adaptive management, monitoring should be recognized as an essential element of each alternative that is subject to impacts analysis. It is necessary for monitoring of baseline environmental conditions and the performance of proscribed management actions to follow the design criteria described by Fish and Wildlife Service scientists in J.H. Reynolds et al, "A road map for designing and implementing a biological monitoring program," 188 ENVIRONMENTAL MONITORING AND ASSESSMENT 399-424 (2016). The impacts analysis cannot be expected to fully describe monitoring tools and protocols that will accompany management actions selected from among alternatives actions; however, it should make explicit that monitoring designs that will accompany the selected management actions will follow the Department of the Interior's monitoring-design road map and that management actions will not be implemented until the attending monitoring can be instituted.

Conclusion

Thank you for giving careful consideration to these comments. We look forward to continuing to participate in the environmental review process.

Sincerely,

William D. Phillimore

Delta Stewardship Council
A CALIFORNIA STATE AGENCY

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March 30, 2022

Cindy Meyer

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Delivered via email: sha-MPR-BDO@usbr.gov

RE: Comments on the Notice of Intent to Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project

Dear Cindy Meyer:

Thank you for the opportunity to comment on the Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation (ROC on LTO) of the Central Valley Project (CVP) and State Water Project (SWP). The Delta Stewardship Council (Council) understands that the objective of the EIS for ROC on LTO of the CVP and SWP, as described in the NOI, is to review and analyze alternatives, topics, and important issues related to the multi-year operations of the CVP and SWP.

The Council is an independent agency of the state of California, established by the Sacramento-San Joaquin Delta Reform Act of 2009, codified in Division 35 of the California Water Code, sections 85000-85350 (Delta Reform Act). The Delta Reform

Act charges the Council with furthering California's coequal goals of providing a more reliable water supply and protecting, restoring, and enhancing the Sacramento-San Joaquin River Delta (Delta) ecosystem. (Wat. Code, § 85054.) The Delta Reform Act further states that the coequal goals are to be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place. The Council is charged with furthering California's coequal goals for the Delta through the adoption and implementation of the Delta Plan, a comprehensive long-term management plan for the Delta and Suisun Marsh that furthers the coequal goals. (Wat. Code, § 85300.)

COMMENTS ON NOTICE OF INTENT

As part of the 2021 ROC on LTO of the CVP and SWP, the U.S. Bureau of Reclamation (Reclamation) should support California's coequal goals for the Delta and the Department of Water Resources' (DWR) compliance with the 2020 Incidental Take Permit[1] (2020 ITP). Additionally, we recommend Reclamation account for the effects of climate change on Reclamation's operations and management of its facilities in the environmental analysis.

Implementation of California's Coequal Goals for the Delta

California's coequal goals for the Delta are achieved, in part, through implementation of regulatory policies, recommendations, and performance measures in the Delta Plan. The Delta Plan guides State and local agencies, such as DWR, in the implementation of their programs, plans, and projects. As a Coordinated Operating Agreement (COA) partner with DWR, Reclamation should describe in the EIS how Reclamation implements, operates, and manages DWR-partnered programs, plans, and projects that would advance the coequal goals. Specific considerations include, but are not limited to, the following:

- **Reduced Reliance on the Delta through Improved Regional Water Self-Reliance.** Reclamation should support and encourage CVP contractors to report their expected outcome for measurable reduction in Delta reliance

[1] Incidental Take Permit for Long-term Operation of the State Water Project. 2020. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Files/ITP-for-Long-Term-SWP-Operations.pdf

and improvement in regional self-reliance in their Urban and Agricultural Water Management Plans.

- **Transparent Water Contracting.** Reclamation should conduct contracting processes for CVP water in a publicly transparent manner consistent to section 226, Title II, Public Law 97-293 or section 3405(a)(2)(B) of the Central Valley Project Improvement Act, Title XXXIV of Public Law 102-575. Reclamation should also review and update its contracting processes to account for more current transparency capabilities (e.g., hybrid in-person and virtual public meetings, list serv public notices with links to electronic versions of public documents) to ensure that the public, including stakeholders who do not usually engage in contract matters, have transparent access to public CVP contracting documents.
- **Delta Flow Objectives**. Reclamation and DWR are required to operate and manage water to meet the State Water Resources Control Board's (Water Board) Bay-Delta Water Quality Control Plan[2] flow objectives. Reclamation should support DWR's efforts and evaluate and seek potential actions to minimize instances when both agencies are not in compliance with the Bay-Delta Water Quality Control Plan and request temporary urgency change petitions from the Water Board.

Support Implementation of DWR's SWP 2020 ITP

Reclamation should include increased CVP support of DWR and the SWP's compliance with provisions of the 2020 ITP as part of the EIS project description, and analyze the potential environmental effects of such support in the EIS. Specific ITP provisions that Reclamation should support include, but are not limited to the following:

- **8.16 Relationship between the SWP adaptative management program (AMP) and the ITP.** The SWP AMP may result in recommendations regarding operational components for the SWP which Reclamation and CVP contractors should support. (2020 ITP, p. 101).

[2] Water Quality Control for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary. 2018. https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf

- **8.17 Export curtailments for spring outflow.** Reclamation and CVP Contractors should support actions by the SWP and its contractors to propose export reductions to protect outflows in the springtime period, April 1 to May 31 of each year. (2020 ITP, p. 102).
- **8.18 Potential to redeploy up to 150 thousand acre feet (TAF) for Delta Outflow.** Reclamation should support the potential for the SWP, under agreement with the California Department of Fish and Wildlife (CDFW), to increase exports in April and May whereby up to 150 TAF of water (known as the Spring Outflow Block) would be made available for CDFW use during the following water year. (2020 ITP, p. 105).
- **8.19 Additional 100 TAF for Delta Outflow.** Reclamation should support SWP efforts to develop a flexible block of water of 100 TAF to supplement Delta outflow during the spring, summer, and fall months to benefit Delta Smelt and Longfin Smelt. (2020 ITP, p. 107).
- **8.20 Delta Outflow Operations Plan and Report.** Reclamation should collaborate with DWR to develop an annual Delta Outflow operations plan to describe potential water available to support ITP provisions such as 8.18 and 8.19. (2020 ITP, p. 108).
- **8.21 Drought Contingency Planning.** Reclamation should coordinate with DWR to meet and confer with State and federal agencies to develop a drought contingency plan for implementation if dry conditions continue into the following year, if the prior water year was dry or critical. (2020 ITP, p. 110).
- **9.1 Compensatory Mitigation for Delta Smelt and Longfin Smelt.** Reclamation should support DWR efforts to mitigate for effects to Delta Smelt and Longfin Smelt by implementing restoration actions. Such actions may include, but are not limited to, developing tidal wetland habitat and Delta Smelt summer-fall food supply and habitat. (2020 ITP, p. 112).
- **9.2 Compensatory Mitigation for Winter- and Spring-run Chinook Salmon.** Reclamation should support DWR efforts to mitigate for effects to Winter- and Spring-run Chinook Salmon by implementing restoration actions. Such actions may include, but are not limited to annually funding restoration projects identified by State and federal fish agencies, supporting implementation of the Yolo Bypass Salmonid Habitat Restoration and Fish

> Passage Project, supporting and funding habitat acquisition and protection, and providing funding for ongoing management of restored habitats. (2020 ITP, p. 120).

Climate Change Considerations

Various models indicate that both the CVP and the SWP will be affected by climate changes due to vulnerabilities from stressors such as increased air temperatures, changes in timing and variability of precipitation, and sea level rise. These stressors will impact the ability of the CVP and the SWP to provide reliable water supplies.

Reclamation should include in the environmental analysis the best available science on climate change; consider climate change impacts to water resources in the Delta watershed and areas that rely on water from the Delta watershed; and ongoing climate change adaptation planning.

CLOSING COMMENTS

As Reclamation proceeds with identifying potential actions to be included in its environmental analysis, the Council invites Reclamation to engage Council staff to discuss potential actions, features, and mitigation measures that would promote the State's Coequal Goals as well as support Reclamation's COA partner, DWR.

More information on the Delta Plan, its regulatory policies, recommendations, and performance measures can be found on the Council website, https://deltacouncil.ca.gov/delta-plan/. Please contact Anthony Navasero at 916-445-5511 or Anthony.Navasero@deltacouncil.ca.gov with any questions.

Sincerely,

Jeff Henderson, AICP
Deputy Executive Officer
Delta Stewardship Council

EAST BAY
MUNICIPAL UTILITY DISTRICT

March 30, 2022

Cindy Meyer
United States Bureau of Reclamation
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SUBJECT: Reinitiation Section 7 Consultation on Long-Term Operation of CVP and SWP

Dear Ms. Meyer:

East Bay Municipal Utility District (EBMUD) appreciates our close working relationship with the US Bureau of Reclamation (USBR) on many issues including protection of fisheries within the Delta and Mokelumne River. One example was the inclusion of additional Delta Cross Channel (DCC) operating standards related to Mokelumne River fall salmon migration and pulse flows that were included in the 2019 BIOP. As part of the reinitiation of consultation, EBMUD hopes that further assessments regarding timing and pathway selection of migrating salmonids through the DCC and coordinated operational scenarios can be included within the scope of the EIS. While data related to straying is available, a more precise understanding of how hydraulics in the area/channels around the DCC are affected by gate operations is needed. In conjunction with improvements to the DCC facility being considered by USBR, establishing better understanding of timing and cues for migrating salmonids and other species will allow for more appropriately timed (season/duration) operations.

EBMUD and the Lower Mokelumne River Partnership (CDFW, USFWS, EBMUD) have invested heavily in ecosystem restoration projects and fisheries studies to ensure a healthy Mokelumne salmon population. Changes to operations of the DCC have the potential to affect migration pathway selection and straying rates of Mokelumne salmon. Efforts to increase the times when the DCC is open in the spring would increase mortality of outmigrating juvenile salmon entrained toward South of Delta pumps. Returning adult salmon will stray to other tributaries when DCC gates are open in the fall. In addition to impacting total returns, changed operations have the potential to impact EBMUD's ability to achieve the CVPIA doubling goal for the Mokelumne.

As an example of the need for additional studies, during the 2021 fall run salmon spawning migration period (September through November), the Delta Cross Channel (DCC) gates were closed 6 times in coordination with Mokelumne pulse flows. While closures have historically provided benefits to reduce straying, that was not the case in 2021. Initial coded wire tag (CWT) data from in river recoveries indicate that a high proportion of Mokelumne River hatchery fish migrated to the American River. Additionally, of all coded wire tag returns to the Central Valley of Mokelumne origin fish, 48% were recovered on the American River, and only 35% were recovered on the Mokelumne River.

The need to better understand migration influence of DCC operations goes beyond local tributary benefits. The Mokelumne salmon population continues to make up a significant portion of the commercial and recreational catch off the coast of California. Numbers released by California Department of Fish and Wildlife (CDFW) show that Mokelumne hatchery origin salmon made up approximately 19 percent of the commercial harvest and 42 percent of the recreational catch in 2022. Considering the size of watershed, average annual runoff, and modest (< 3 percent) Delta outflow contribution, the Mokelumne's contribution to the salmon industry and dependent businesses remains significant.

The overall contribution of Mokelumne River origin salmon to Statewide fisheries coupled with the need to continue efforts to meet CVPIA doubling goal target require a more precise understanding of the migration patterns/cues near the DCC and how operations can be improved to achieve multiple benefits. Thank you for considering EBMUD's scoping comments and we look forward to continued cooperation in the reinitiation process. Please contact Michelle Workman, Fisheries & Wildlife Division Manager, (michelle.workman@ebmud.com, 209-263-6350) if you have any questions or coordination needs.

Sincerely,

Jose D. Setka
Environmental Affairs Officer

El Dorado Water Agency

March 30, 2022

Cindy Meyer, Project Manager
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SUBJECT: Comments in Response to Notice of Intent to Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project, 87 FR 11093

Dear Cindy:

Thank you for the opportunity to provide scoping comments for the preparation of the Environmental Impact Statement on the 2021 Endangered Species Act reinitiation of Section 7 consultation on the long-term operation of the Central Valley Project (CVP) and State Water Project (SWP).

El Dorado Water Agency (Agency) appreciates the opportunity to provide scoping comments for the preparation of the Environmental Impact Statement on the 2021 Endangered Species Act reinitiation of Section 7 consultation on the long term operation of the Central Valley Project (CVP) and State Water Project (SWP).

The Agency has countywide authorities to ensure sufficient water supplies are available for present and future beneficial uses within the County of El Dorado. This authority includes the powers to cooperate and contract with the U.S. Bureau of Reclamation. Members of the Agency include the County of El Dorado and the five large water purveyors within the boundaries of the county. The purveyors include South Lake Tahoe Public Utility District, Tahoe City Public Utility District, El Dorado Irrigation District, the Grizzly Flats Community Services District, and Georgetown Divide Public Utility District. Representatives from these purveyors have rotating appointments to serve on the Agency's Board of Directors.

The Agency appreciates the continued success to work with regional interests to meet a diverse set of objectives such as the 2019 Biological Opinions that included provisions to balance reliable water supply deliveries while providing adequate cold water for the aquatic health of the American River.

Given the interest statement above, the Agency would like to offer the following comments:

1. Reclamation maintains the ability through the Municipal and Industrial Water Shortage Policy (WSP) to treat allocations differently between CVP divisions due to regional CVP water supply availability, system capacity, or other operational constraints. This water year has shown that

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regional hydrologic variability can occur between different Sacramento-San Joaquin Delta tributaries. For example, while conditions across the state this year were dry, the American River watershed was still within a relatively normal range for snowpack and projected inflow. However, CVP allocations for American River Division contractors were reduced to a level that appeared to be inconsistent with conditions present within the watershed. We support the regional request that Reclamation consider an American River-specific CVP allocation that accounts for localized conditions. At a minimum, reductions in allocations should be suspended for the months in which Reclamation is conducting increased releases from Folsom Reservoir to maintain flood control capacity.

2. As stated in the American River diverters 2018 scoping comment letter regarding the prior reinitiation of Section 7 consultation, the Agency emphasizes that any operational or structural changes made in one part of the system could redirect impacts to another part of the system, or supply sources outside of the CVP and SWP but which are relied upon by some American River Division contractors, such as the Yuba, Bear, and Consumes Rivers. Therefore, the Agency supports the regional concerns regarding potential impacts to the future water supply reliability and ecosystem sustainability of the American River as a result of operational revisions elsewhere in the CVP and SWP.

3. The Agency is directed to ensure sufficient water supplies are available for present and future beneficial uses within the County of El Dorado, which include considerations of the Area of Origin water rights to meet the future water supply needs for the County. Operation of CVP is subject to the requirements of the Watershed Protection Statutes (Water Code §§ 11460 - 11465) and the Area of Origin Statutes (Wat. Code §§ 10500- 10506). Such statutes benefit the existing and future water needs within El Dorado County areas. Therefore, the Agency request that CVP operations remain consistent with the protections afforded by these statutes and those CVP permit terms, which benefit and protect the existing and future water supply needs in the upstream areas of the American River watershed, including El Dorado County.

Thank you for your consideration of our comments. If you have questions or need clarifications, please contact Ken Payne at ken.payne@edcgov.us

Sincerely,

Kenneth V. Payne, P.E.
General Manager

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March 30, 2022

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Subject: Notice of Intent to Prepare an Environmental Impact Statement for the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project

Dear Cindy Meyer:

The Environmental Protection Agency has reviewed the February 28, 2022 Notice of Intent to prepare an Environmental Impact Statement for the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project. Our comments are provided pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act.

The EPA understands that Reclamation requested to reinitiate consultation on the Long-Term Operation of the CVP and SWP under Section 7 of the ESA due to anticipated modifications to the previous Proposed Action that may cause effects to ESA-listed species or designated critical habitat not analyzed in the current 2019 Biological Opinions. Modifications would address the review of the 2019 Biological Opinions required by Executive Order 13990 Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, and voluntarily reconcile CVP operating criteria with requirements of the SWP under the California Endangered Species Act.

Populations of all the species covered by the original 2008/2009 Biological Opinions and the 2019 Biological Opinions, as well as several non-listed resident and migratory fishes, have continued to decline. The continued decline of resident and migratory fish populations suggests that the suite of RPAs implemented to date, plus commitments to improve protection for aquatic habitat in the Bay Delta watershed, has not been successful in protecting aquatic habitat, reversing population declines, avoiding jeopardy, and/or improving aquatic life beneficial use protection. The pace and severity of the decline highlight the urgent need to move forward with full implementation of ESA compliance actions and, perhaps, additional measures in an adaptive management context to ensure their effectiveness.

It is important for a project of this scale to clarify what actions (programmatic and/or project-level) this environmental review process is supporting. Specifically, in the Draft EIS, clarify what actions will ultimately be supported by the Record of Decision and identify if specific actions are described because they will be offsetting negative impacts from continued pumping. Additionally, be clear about the time frame this document would be supporting so that the public and decisionmakers know how this document can be relied upon for future coverage.

To assist in the scoping process for this project, we have identified several issues for your attention in the preparation of the EIS. Additionally, we note that the NOI states that Reclamation intends to invite the EPA to be a cooperating agency and we look forward to working with you. We appreciate the opportunity to review this NOI and are available to discuss our comments. If you have any questions, please contact me at (415) 972-3098 or gordon.stephanies@epa.gov

Sincerely,

Stephanie Gordon
Environmental Review Branch

Enclosures: EPA's Detailed Comments

U.S. ENVIRONMENTAL PROTECTION AGENCY DETAILED COMMENTS ON THE NOTICE OF INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT FOR THE 2021 ENDANGERED SPECIES ACT REINITIATION OF SECTION 7 CONSULTATION ON THE LONG-TERM OPERATION OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT—MARCH 30, 2022

Statement of Purpose and Need

The Draft Environmental Impact Statement prepared for the Long-Term operation of the Central Valley Project and State Water Project should clearly identify the underlying purpose and need to which the Bureau of Reclamation is responding in proposing the alternatives. The *purpose* of the proposed action is typically the specific objectives of the activity, while the *need* for the proposed action may be to eliminate a broader underlying problem or take advantage of an opportunity.

The purpose and need should be a clear, objective statement of the rationale for the proposed project, as it provides the framework for identifying project alternatives. The EIS should concisely identify why the project is being proposed, why it is being proposed now, and should focus on the specific desired outcomes of the project (e.g., secure reliable water supply, protect beneficial uses in the Delta). The purpose and need should also clearly describe Reclamation's role and federal action in the project, particularly regarding the similarities and differences with the Department of Water Resources' objectives and future actions as outlined in the Coordinated Operation Agreement. We note that the Purpose and Need as described in the Notice of Intent has changed from the 2020 Record of Decision and we support Reclamation in developing an EIS that reinforces a Range of Alternatives that support the multiple purposes of the CVP.

Alternatives Analysis

All reasonable alternatives that fulfill the project's purpose and need should be evaluated in detail. The EIS should provide a clear discussion of the reasons for the elimination of alternatives which are not evaluated in detail. A robust range of alternatives will include options for avoiding significant environmental impacts. The EIS should clearly describe the rationale used to determine whether impacts of an alternative are significant or not.

The environmental impacts of the proposal and alternatives should be presented in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14(b)). The potential environmental impacts (including benefits) of each alternative should be quantified to the greatest extent possible (e.g., acres of wetlands impacted; change in water quality parameters).

The No Action Alternative should clearly describe the current Central Valley Project operating criteria. It should specify the regulatory vehicles that govern the operational regimes including water rights, the Endangered Species Act, and water quality standards in the Bay Delta Water Quality Control Plan and include details of all permits and transfers related to the current pumping.

Please describe the time frame for which the agency would be applying for ESA coverage. If unknown, please bookend possible scenarios (10-year, 20-year) and their expected environmental impacts.

Regulatory Framework

The EIS prepared for the proposed action should include a comprehensive description of the regulatory context of the project. This section should include a description of any permits and/or modifications to those state and federal permits that the proposed action would require.

The analysis in the new EIS should reflect changes in the regulatory regime. At this time, the State Water Resources Control Board has finalized and is implementing the 2018 amendments to the Water Quality Control Plan in the lower San Joaquin River and its tributaries. In addition, the State Board has announced an aggressive schedule for amending the WQCP including Delta outflow and Sacramento watershed requirements. Although

the EIS analysis cannot predict the exact outcome of these new regulatory efforts, the analysis should include sensitivity or sideboard analyses of potential regulatory changes in the immediate future.

Clean Water Act Section 404

Reclamation should coordinate with the U.S. Army Corps of Engineers (USACE) to determine if any of the proposed actions require a Section 404 permit under the Clean Water Act. Section 404 regulates the discharge of dredged or fill material into waters of the United States, including wetlands and other special aquatic sites. The EIS should describe all waters that could be affected by the project alternatives and include a jurisdictional delineation for all waters. The EIS should include maps that clearly identify all waters within the direct footprints of the construction and operational areas (including the project area and proposed facilities). A jurisdictional delineation will confirm the presence or absence of waters in the project area and help determine methods for impact avoidance if state and federal permits would be required for activities.

If a Section 404 permit is required, the EPA may review the project for compliance with Section 404(b)(1) Guidelines. Any permitted discharge into Waters of the U.S. must be the *least environmentally damaging practicable alternative* available to achieve the project purpose. If needed, the EIS should include an evaluation of the project alternatives within this context in order to demonstrate the project's compliance with the 404(b)(1) Guidelines.

Water Quality

The water quality discussion in the EIS should include a description of constituents of concern, water quality standards (termed 'objectives' in California Basin Plans and Water Quality Control Plans) and designated beneficial uses in the study area and a quantitative water quality analysis that compares to all water quality standards and objectives described. The EPA notes that there are many quantitative and qualitative water quality standards that apply to CVP/SWP operations, as described in the Water Boards' Basin Plans and Water Rights Decision 1641 and 90-5. In the EIS, discuss how each alternative would affect water quality with respect to narrative and numeric water quality objectives, highlight any predictions of exceeded water quality standards, and identify mitigation strategies that would prevent such exceedances.

The EIS should discuss how droughts are incorporated into the CalSim model for water supply and quality impact analysis and acknowledge that drought can and has altered hydrology in the Delta. Contingency procedures for severe droughts should be discussed in this document, including the frequent use of Temporary Urgency Change Petitions (TUCP) filed with the State Water Board by Reclamation and DWR. In previous drought conditions, multiple water quality objectives were not met for at least two years, resulting in a substantial impact on aquatic life beneficial uses throughout the study area. In the EIS, provide a description of the adjustments to the Proposed Action made during drought conditions, recognizing that low precipitation might be the new normal climate pattern, and report their impacts on covered fishes. The EPA recommends that Reclamation commit to include in its ongoing monitoring and reporting program any deviations from the Reasonable and Prudent Alternatives for drought conditions and describe the impacts that severe drought is having on the species and habitats that they depend on.

Biological Resources

In 2009, several federal agencies, including Reclamation and the EPA, declared that the Sacramento-San Joaquin River Delta ecosystem, part of the larger San Francisco estuary, was in a state of collapse.[1] This declaration was made after several years of sharp population declines in four resident fishes, commonly referred to as the pelagic organism decline (POD), followed by sharp drops in Chinook salmon abundance. Two of the POD fishes were already rare while the other two were formerly the most abundant fishes in the estuary. Low Chinook salmon populations resulted in a multi-year closing of commercial and recreational fishing.

[1] California Bay-Delta MOU (http://www2.epa.gov/sites/production/files/documents/baydeltamousigned.pdf); Interim Federal Action Plan (https://www.doi.gov/sites/doi.gov/files/migrated/news/doinews/upload/CAWaterWorkPlan.pdf)

The 2009 National Marine Fisheries Service Biological Opinions (BOs) observed the status of winter-run and spring-run Chinook salmon as trending sharply downward followed by years of low abundance. These populations have not recovered appreciably since then. The potential for impacts, including thermal impacts, is not only below Keswick Dam, but also along the length of the Sacramento River to the Delta. The lack of meaningful recovery of winter-run and spring-run Chinook as well as of other resident and migratory fish populations since 2007 suggests that the implementation approach of the RPAs, plus commitments to improve protection for aquatic habitat in the Bay Delta watershed, has not been successful in protecting aquatic habitat, reversing population declines, avoiding jeopardy, or improving aquatic life beneficial use protection. The pace and severity of the decline highlight the urgent need to move forward with full implementation of the RPAs and, perhaps, additional measures in an adaptive management context to ensure their effectiveness.

The EIS should identify all petitioned and listed threatened and endangered species and critical habitat that might occur within the project area. The document should identify and quantify which species or critical habitat might be directly, indirectly, or cumulatively affected by each alternative and mitigate impacts to these species; emphasis should be placed on the protection and recovery of species due to their status or potential status under the federal or state Endangered Species Act.

Timing and Coordination of NEPA documents

The NOI states that "reasonable alternatives may include combinations of operation of CVP and SWP facilities and diversions, construction actions, habitat restoration, conservation hatchery practices, and monitoring and special studies…and may include DWR operations for new storage projects." The EPA is aware that some of these site-specific projects may already be underway, and some have not yet completed the NEPA process (e.g., Delta Conveyance). The EPA recommends that the EIS discuss the prospects and "triggers" for developing additional NEPA documentation, including site-specific Environmental Assessments (EAs) or EISs for individual projects and/or operational criteria. The basis for such additional NEPA reviews should be described, including federal agency permitting that may trigger NEPA document development. In general, topics such as operation of all CVP facilities including reservoirs and forebays and canals should be generally discussed in the EIS (e.g., expected operational ranges) and discussed in more detail in the site-specific NEPA documentation.

The EIS should discuss the status and possible environmental impacts of two major projects that are currently underway- Sites Reservoir and Delta Conveyance. Both of these large construction projects have the potential to alter the operations of the CVP and SWP in a meaningful way.

Cumulative and Indirect Impacts

The cumulative impacts analysis should identify how resources, ecosystems, and communities in the project have already been, or will be, affected by past, present, or future activities in the project area. These resources should be characterized in terms of their response to change and capacity to withstand stresses. Trends data should be used to establish a baseline for the affected resources, to evaluate the significance of historical degradation, and to predict the environmental effects of the project components.

For the cumulative impacts assessment, we recommend focusing on resources of concern or resources that are "at risk" and/or are significantly impacted by the proposed project, before mitigation. For this project, Reclamation should conduct a thorough assessment of the cumulative impacts to aquatic and biological resources, especially in the context of the other developments occurring and proposed in and around the Bay Delta estuary.

The EPA recommends that the EIS identify which resources are analyzed, which ones are not, and why. For each resource analyzed, the EIS should:

- Identify the current condition of the resource as a measure of past impacts. For example, the percentage of species habitat lost to date.

- Identify the trend in the condition of the resource as a measure of present impacts. For example, the health of the resource is improving, declining, or in stasis.
- Identify all on-going, planned, and reasonably foreseeable projects in the study areas, including planned restoration under EcoRestore, which may contribute to cumulative impacts.
- Identify the future condition of the resource based on an analysis of impacts from reasonably foreseeable projects or actions added to existing conditions and current trends.
- Assess the cumulative impacts contribution of the proposed alternatives to the long-term health of the resource and provide a specific measure for the projected impact from the proposed alternatives.
- When cumulative impacts are identified for a resource, mitigation should be proposed.
- Disclose the parties that would be responsible for avoiding, minimizing, and mitigating those adverse impacts.
- Identify opportunities to avoid and minimize impacts, including working with other entities.

The EIS should consider the cumulative impacts associated with other development projects proposed in the area and the potential impacts on various resources including water supply, endangered species, and habitat.

The EIS should quantify cumulative impacts across resources areas, as well as describe and evaluate feasible mitigation measures to avoid and minimize the identified adverse cumulative impacts. Although these mitigation measures may be outside the jurisdiction of the lead agency or project proponents, describing them in the EIS would serve to alert other agencies or officials who can implement these extra measures (CEQ 40 Questions No. 19(b)).

Climate Change

Consistent with the policies of Executive Order 14008, *Tackling the Climate Crisis at Home and Abroad*, the EPA recommends that Reclamation identify measures to provide for diverse, healthy ecosystems that are resilient to climate stressors; require effective mitigation; and identify and protect areas of potential climate refugia. We also recommend considering whether additional conservation commitments may be warranted to achieve the goal in Section 216 of Executive Order 14008 of conserving 30 percent of the nation's lands and waters by 2030.

The EIS should consider how climate change could potentially influence the study area, and how implementation of the proposed project could lessen or potentially mitigate for these impacts. Conversely, the EIS should assess how the projected impacts could be exacerbated by climate change.

Given the current severe drought in California, the EPA anticipates that both the EIS and the revised Biological Opinions will focus on drought impacts on listed species and their habitats. The EPA notes that climate models also suggest more severe precipitation events in the future, with a higher risk of catastrophic flooding in the project area. Flood management – a primary project purpose for the CVP – also needs significant review in the EIS. In addition to impacts on life and property, floods have significant adverse impacts on many listed species. The EIS should evaluate possible changes to flood management strategies. Flood plain restoration and flood bypasses, for example, can have multiple benefits for both flood management and for aquatic resources. The EIS should evaluate what those measures might mean for operations planning.

Coordination with Tribal Governments

Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments* (November 6, 2000), was issued to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications, and to strengthen the United States government-to-government relationships with Indian tribes.

The Draft EIS should describe the process and outcome of government-to-government consultation between Reclamation, tribes, issues that were raised, and how those issues were addressed in the selection of the

proposed alternative. There are Indian Trust Assets affected by the Trinity River Division and the potential impacts of CVP operation on those assets should be examined in the EIS.

National Historic Preservation Act and Executive Order 13007
Consultation for tribal cultural resources is required under Section 106 of the National Historic Preservation Act. Historic properties under the NHPA are properties that are included in the National Register of Historic Places or that meet the criteria for the National Register. Section 106 of the NHPA requires a federal agency, upon determining that activities under its control could affect historic properties, consult with the appropriate State Historic Preservation Officer/Tribal Historic Preservation Officer. Under NEPA, any impacts to tribal, cultural, or other treaty resources must be discussed and mitigated. Section 106 of the NHPA requires that Federal agencies consider the effects of their actions on cultural resources, following regulation in 36 CFR 800.

Executive Order 13007, *Indian Sacred Sites* (May 24, 1996), requires federal land managing agencies to accommodate access to, and ceremonial use of, Indian sacred sites by Indian Religious practitioners, and to avoid adversely affecting the physical integrity, accessibility, or use of sacred sites. It is important to note that a sacred site may not meet the National Register criteria for a historic property and that, conversely, a historic property may not meet the criteria for a sacred site.

The Draft EIS should address the existence of Indian sacred sites in the project areas. It should address Executive Order 13007, distinguish it from Section 106 of the NHPA, and discuss how Reclamation will avoid adversely affecting the physical integrity, accessibility, or use of sacred sites, if they exist. The Draft EIS should provide a summary of all coordination with Tribes and with the SHPO/THPO, including identification of NRMP eligible sites, and development of a Cultural Resource Management Plan.

Environmental Justice
Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (February 16, 1994), directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations. It further directs agencies to develop a strategy for implementing environmental justice and providing minority and low-income communities access to public information and public participation. As such, we recommend that Reclamation address adverse environmental effects of the proposed project on these communities and outline measures to mitigate for impacts.

We encourage Reclamation to use EPA's EJSCREEN and/or the most recent American Community Survey from the U.S. Census Bureau (i.e., 2014-2018) for the Draft EIS to determine the presence of minority and low-income populations. However, it is important to note that minority and low-income can be measured in various ways.

A minority population does not need to meet a 50 percent standard if "the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis."[2] To best illustrate the presence of a minority population, we recommend that Reclamation analyze block groups, the smallest geographical unit that the U.S. Census Bureau publishes data for. We caution using larger tracts in the analysis, such as counties or cities, as these may dilute the presence of minority populations.

The NEPA Committee of the Federal Interagency Working Group on Environmental Justice has noted that, in some cases, it may be appropriate to use a threshold for identifying low-income populations that exceeds the

[2] Council on Environmental Quality. Environmental Justice: Guidance Under the National Environmental Policy Act. December 1997. Available at https://www.epa.gov/sites/production/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf.

poverty level.[3]

After Reclamation has determined if minority and low-income populations exist in the project area, we recommend that the Draft EIS discuss whether these communities would be potentially affected by individual or cumulative actions of the proposed action. We also recommend addressing whether any of the alternatives would cause any disproportionate adverse impacts, such as higher exposure to toxins; changes in existing ecological, cultural, economic, or social resources or access; cumulative or multiple adverse exposures from environmental hazards; or community disruption.

If it is determined that minority and low-income populations may be disproportionately impacted, describe in the Draft EIS the measures taken by Reclamation to fully analyze the environmental effects of the action on minority communities and low-income populations and identify potential mitigation measures. Clearly identify a monitoring and adaptive management plan to ensure that mitigation is effective and successful.

Present opportunities for affected communities to provide input into the NEPA process. In the Draft EIS, include information describing what was done to inform these communities about the project and the potential impacts it will have on their communities (notices, mailings, fact sheets, briefings, presentations, translations, newsletters, reports, community interviews, surveys, canvassing, telephone hotlines, question and answer sessions, stakeholder meetings, and on-scene information), what input was received from the communities, and how that input was utilized in the decisions that were made regarding the project.

[3] Federal Interagency Working Group on Environmental Justice & NEPA Committee. Promising Practices for EJ Methodologies in NEPA Reviews. March 2016. Available at: https://www.epa.gov/sites/production/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

California Farm Bureau

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March 30, 2022

Cindy Meyer
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Bay-Delta Office
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Sacramento, CA 95814-2536

RE: ***Scoping Comments – Draft Environmental Impact Statement Analyzing 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project***

Dear Ms. Meyer:

The California Farm Bureau ("Farm Bureau") appreciates the opportunity to provide scoping comments on a potential draft Environmental Impact Statement ("EIS") which analyzes potential modifications to the Long-Term Operation of the Central Valley Project ("CVP") and the State Water Project ("SWP").

Farm Bureau is a non-governmental, non-profit, voluntary membership California corporation whose purpose is to protect and promote agricultural interests throughout the state of California and to find solutions to the problems of the farm, the farm home, and the rural community. Farm Bureau is California's largest farm organization, comprised of 53 county Farm Bureaus currently representing approximately 30,767 agricultural, associate and collegiate members in 56 counties. Farm Bureau strives to protect and improve the ability of farmers and ranchers engaged in production agriculture to provide a reliable supply of food and fiber through responsible stewardship of California's resources. Since reliable and affordable water supplies are critical to California agriculture, and because a preponderance of Farm Bureau's membership either receives water supply through the CVP or SWP or is otherwise affected by the operations of these projects, Farm Bureau has a vital interest in their operation.

We appreciate the Bureau of Reclamation's ("Reclamation's") effort to analyze potential modifications to the CVP, in a coordinated manner with the SWP, to maximize water deliveries and augment operational flexibility of the projects in support of that goal. In particular, we appreciate Reclamation's stated intent in the Federal Register notice of Monday, February 28, 2022, to consider non-flow measures in the alternatives analyses to include habitat restoration and conservation hatchery practices which may protect or improve relevant fish populations. In addition, Reclamation's Federal Register notice rightly recognizes that operations of CVP and SWP affect the quality of the human environment[1], and correctly anticipates analyzing potential impacts such as those on surface water supply, water quality, groundwater resources, regional economics, land use and agricultural resources. Because project operations have been constrained mightily in recent years by environmental regulation calibrated to protect fish populations in the Sacramento-San Joaquin River system, the status quo is no longer working for a wide swath of California's human users of CVP and SWP water - and because so much of California's water use is interrelated, it has ultimately affected the preponderance of California's population and economy.

In the draft EIS and its alternatives analysis, therefore, we ask that Reclamation recognize that California's water situation is unsustainable for the future, not only for those who receive CVP and SWP water, but for the state as a whole. Some of the major reasons for this are:

- Drought is a fact of life in California. Recent drought years have given California a foretaste of what an extended drought will look like with our current infrastructure and regulatory overlay. Current trends now suggest such droughts could become more common and, potentially, worse. Those longer and drier droughts are part of a possible larger climate trend, the flipside of which is more infrequent, but bigger and flashier floods—which means we must do a much better job capturing more water when it's available.

- The Sierra snowpack is diminishing. Another serious aspect of a possible changing climate in California is a shrinking snowpack, which at a historical average of 14 million acre-feet is California's largest "reservoir" of water for spring and summer release through the river system to coincide with the growing season. This also underscores the need to capture more water, both in surface reservoirs – of which more are needed – and in our aquifers, as California finds it imperative to focus more intensely on groundwater recharge and underground water storage.

[1] *San Luis & Delta-Mendota Water Authority (SLDMWA) v. Jewell*, 747 F.3d 581 (9th Cir. 2014), and *SLDMWA v. Locke*, 776 F.3d 971 (9th Cir. 2014).

- The Sustainable Groundwater Management Act of 2014 is here. At the same time bigger droughts and less snowpack forces California to turn increasingly to groundwater for human use. Groundwater will potentially become less available – at least in some areas – as the Sustainable Groundwater Management Act of 2014 ("SGMA") is implemented. This landmark, comprehensive legislation portends a new era of limits for California water users.

- Regulatory water demands will increase with declining aquatic species. As another consequence of a changing hydrology and water temperatures, we can almost certainly expect further declines in listed fish species. This will likely lead to heightened conflicts as a result of rising regulatory tensions and intense competition for limited water.

We ask that Reclamation then recognize that bold, integrated and collaborative actions are required to restore reliability of CVP and SWP deliveries – as well as to improve California's overall water supply and demand balance on the system level, because so much of California's water use is interrelated. Some of these efforts include:

- Storage Integration. As shown in the 2017 Storage Integration Study by the Association of California Water Agencies ("ACWA"), California's water supply reliability can benefit significantly from greater integration of new and existing surface and groundwater storage. While permitting, financing and engineering questions remain before the exact contours of an optimized statewide package of potentially beneficial new surface storage facilities can fully emerge, several storage projects are in advanced planning and funding stages at this time.

  Moreover, the spillway failure at Oroville Dam in 2017 served to highlight the urgent need for substantial on-going maintenance, repair, rehabilitation, modernization and improvement of existing Reclamation and U.S. Army Corps of Engineers structures and facilities.

  In addition to potential expanded on-farm recharge in strategic locations on the eastern edge of California's Central Valley, there are a number of proposed large-scale groundwater banking facilities with potential statewide and regional benefits. Such groundwater banking and recharge projects will be increasingly important as local Groundwater Sustainability Agencies begin implementation of Groundwater Sustainability Plans under SGMA.

  Also critical to any large-scale groundwater recharge program will be a permanent fix to issues relating to land subsidence along the Friant-Kern Canal, and intensive local development of groundwater managed aquifer

replenishment projects in the San Joaquin River and Tulare Lake Basin, all along the Eastside of the Central Valley.

- Federal-State-Local Partnerships. In a variety of studies and reports relating to management of water resources in both the surface water and groundwater contexts, the California Department of Water Resources ("DWR") has examinded potential opportunities to increase system resilience. Reclamation and the Corps must lead similar federal efforts to increase reservoir yields, recharge more groundwater, and increase system flexibility. Both DWR and the federal government should work with local agencies to facilitate regional solutions that include public benefits, and that benefit California's economy and California's water system as a whole. For the federal government, this includes leadership and partnership to ensure meaningful investment and viable project implementation.

- Delta Operations.

  - *Near-Term WIIN Act Operational Flexibility*. Reclamation, in its coordinated operations of the CVP in connection with the SWP, must take maximum advantage of the operational flexibility provisions made available in the Water Infrastructure Improvements for the Nation (WIIN) Act. However, near-term flexibility under the WIIN Act, alone, will not be sufficient to provide the necessary long-term flexibility to significantly improve the reliability of CVP and SWP project deliveries in export areas located south of the Sacramento-San Joaquin River Delta.

  - *Long-Term Delta Solutions*. As highlighted in ACWA's Integration Study, long-term fixes in the Delta may require both physical improvements, improved species habitat, and legislative and regulatory reforms in the area of species protections and water management. While the question of major new infrastructure is beyond the scope of this comment letter, improved Delta conveyance could also involve a mix of:

    - ✓ Regulatory and operational modernizations and improvements;
    - ✓ Smaller-scale, cost-effective, readily implementable system fixes within, upstream, and down-pipe of the Delta, whether in combination with other more ambitious conveyance proposals, or possibly as self-standing or supplemental projects;[2]

[2] From an agricultural standpoint particularly, it is important to note that improvements to Delta conveyance that are overly expensive, that are not fundable, implementable, or permittable within

- ✓ Improved water management, in all sectors throughout the Delta's watershed and its associated exports service areas;
- ✓ Improved habitat conditions for endangered fish species both in the Delta and upstream of the Delta;
- ✓ Reduced stressors;
- ✓ Improved fishery management;
- ✓ Upstream water management;
- ✓ New storage both north and south of the Delta, both above and below ground.

While the exact nature of a comprehensive Delta solution that can be funded, permitted and implemented remains uncertain, basic equities require a solution that protects water quality in the Delta and that is fair and just to Delta communities. At same time, the fact that many aspects of the *status quo* in the Delta are unacceptable and unsustainable for *all* of the communities, and especially important farming areas south of the Delta, is almost universally acknowledged.

- *Functional Flows and Habitat Restoration*. In addition to the priorities above, lasting fixes to California's water system will require breaking with failed policies and approaches of the past and embracing bold new collaborative approaches to species and habitat management.

- *Environmental Water Use Efficiency*. Efficiency and accountability for results in the area of environmental water use must be placed on a par with efficient use and accountability in other areas of water use.[3] As a major part of this move toward more efficient and effective environmental water use, times and volumes of environmental water releases must take account of the intersection of environmental water flows and the broader suite of relevant environmental stressors and ecological functions. Such stressors and ecological functions include:

  - ✓ Improved cold water management;

a reasonable amount of time, or those that do not provide desired levels of long-term reliability, affordability, increased water supply, are solutions that may ultimately necessitate a look at possible alternatives. While the current situation with respect to long-term Delta conveyance is uncertain and highly fluid, all viable and technically feasible alternatives should be considered as part of the DEIR.

[3] Article X, section 2 of the California Constitution requires that all uses of water be reasonable and non-wasteful.

- ✓ Improved management of dedicated environmental water assets including potential environmental water purchases from willing sellers;
- ✓ Seasonally inundated floodplains;
- ✓ Modified local diversion times and intra-annual storage, including offstream ponds and on-farm recharge;
- ✓ Land and water management for an improved aquatic food web;
- ✓ Instream habitat features;
- ✓ Restored tidal marsh in the Sacramento and San Joaquin Delta;
- ✓ Improved migration pathways and access to high quality upstream habitats;
- ✓ Improved hatchery management;
- ✓ Predator control;
- ✓ Fish screens and barriers;
- ✓ Possible predator exclusion weirs;
- ✓ Other managed human interventions including safe harbor for dry-year rescue efforts, dry-year channel modification and maintenance for emergency fish passage, modern conservation hatchery techniques, managed trucking or barging, and the like;
- ✓ Flood system improvements and improved management of periodic flood flows for multiple benefits, including seasonally inundated floodplain habitat in combination with floodplain agriculture.

With respect to environmental and socioeconomic impacts and their assessment within the context of the alternatives analysis undertaken in the DEIS, it goes without saying that the service areas of both the CVP and the SWP superintend millions of acres of California's landscape and affect tens of millions of people. For both source regions and the service areas, the DEIS must examine impacts to:

- Groundwater resources. The DEIS must recognize impacts to groundwater resources, both as a function of groundwater recharge and groundwater substitution.

- Water quality. The DEIS must recognize impacts to water quality, including dry-year impacts and potential impacts on irrigation, crop yields, and potential salt-trapping in the Delta.

- Land use. The DEIS must examine land use impacts of the various alternatives, including agricultural fallowing.

- Socioeconomic effects. The DEIS must examine socioeconomic effects, including economic impacts and employment.

We appreciate Reclamation's consideration of the foregoing and look forward to following Reclamation's efforts to improve CVP operations as this process moves forward. Please do not hesitate to contact me directly, if any questions arise about this letter.

Very truly yours,

Christian C. Scheuring
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CCS/jt

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March 30, 2022

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Dear Ms. Meyer:

On behalf of Friant Water Authority (FWA), thank you for the opportunity to provide comments in response to the Bureau of Reclamation's (Reclamation) February 28, 2022 "Notice of Intent to Prepare an Environmental Impact Statement and Hold Public Scoping Meetings on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project."

FWA is a public agency formed under California law to operate and maintain the Friant-Kern Canal and to represent our members, including a majority of the contractors in the Central Valley Project's Friant Division, in federal or state policy, political, and operational decisions that could affect their water supplies. Our goal is to provide dependable, sustainable water from Millerton Reservoir to Friant Division contractors, including 30 cities and districts representing 15,000 family farms on more than one million acres of farmland on the eastside of the southern San Joaquin Valley. FWA (initially the Friant Water Users Authority) has operated and maintained the Friant-Kern Canal as a "transferred work" under contract to Reclamation, who owns the canal as part of the CVP, since 1986.

FWA has prepared the following comments and questions for Reclamation to consider as this process moves forward.

1. Threshold Requirements for Reinitiation Have Not Been Met. Section 402.16(a) of the Federal Endangered Species Act (ESA) establishes when reinitiation is of consultation is required. These include:

"(1) If the amount or extent of taking specified in the incidental take statement is exceeded;

> *(2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;*
>
> *(3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or*
>
> *(4) If a new species is listed or critical habitat designated that may be affected by the identified action."*

It is not clear that current conditions satisfy any of the above criteria triggering a requirement for reinitation of consultation. In the February 28, 2022, Notice of Intent, Reclamation described the purpose and need for reinitiation as "anticipated modifications to the previous Proposed Action that may cause effects to ESA-listed species or designated critical habitat not analyzed in the current 2019 Biological Opinions." However, anticipating a need to modify an existing Proposed Action such that listed species may be affected is not the same as actually triggering the requirement to reinitiate consultation. It appears to us that there is no requirement to reinitiate consultation but instead this decision is being made as a discretionary matter. Please clarify whether it is Reclamation's position that consultation is required or if this is being undertaken as a discretionary matter.

2. Involvement of Public Water Agencies is Required. If Reclamation intends to still pursue consultation under ESA, Reclamation must ensure it follows all requirements under Federal law to involve public water agencies, stakeholders, and the public, including those prescribed under the Water Infrastructure Investments for the Nation Act (WIIN Act). Section 4004(a) of the WIIN Act describes, as a matter of law, the rights and opportunities of public water agencies to be active participants in the consultation process, including reviewing draft reports and assessments, and proposing reasonable and prudent alternatives. Please explain how Reclamation will meet this legal requirement.

3. Consultation Must Be Independent from Current Litigation. The 2019 Biological Opinions (BiOps) and State of California's 2020 Incidental Take Permit (ITP) are both currently being litigated. While both documents share many common elements, notable differences exist and disagreement over those discrepancies is a key part of the litigation. Until those cases are resolved, it is inappropriate for Reclamation to consider any of the actions challenged in the ITP for inclusion in any potential proposed actions or alternative analyses.

As a public water agency representing Federal water users, FWA was an active participant in the consultation that produced the 2019 BiOps and we understand the thoughtfulness and rigor with which they were developed. As Reclamation considers how to undertake this task again, we stand

ready to assist as necessary. Please do not hesitate to reach out to me or my staff with any questions.

Sincerely,

Jason Phillips
Chief Executive Officer

Cindy Meyer, Project Manger
United States Bureau of Reclamation,
California-Great Basin Bay-Delta Office
801 I Street, Suite 140
Sacramento, CA 95814-2536

RE: Comments in Response to Notice of Intent to Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project, 87 FR 11093

Dear Ms. Meyer,

Friends of the River and Save the American River Association submits the following comments on the intended scope of the proposed Environmental Impact Statement (EIS) for analyzing potential modifications to the Long-Term Operation (LTO) of the Central Valley Project (CVP) and the State Water Project (SWP).

The American River's Modified Flow Management System (MFMS) tries to support fisheries, esthetics, and recreation in stressful, lower water years. Satisfying the MFMS should not be considered as fully protective of these values.

- In consultation the Water Forum, the Modified Flow Management System may need revisions to better protect Folsom Reservoir storage and to protect the fisheries, esthetics, and recreation in the lower river.

- The MFMS should provide better flow protection of fisheries and recreation in the reaches of the river just below Nimbus in years when there are sufficient flows. The minimum release requirement may be suitable to be increased in wetter years.

- Federal and state agencies have responsibility under the Wild and Scenic Rivers

Acts to protect recreation and the other goals of the acts. Operational decisions should take account these responsilities.

- Federal and state fisheries agencies have a responsibility to protect listed fisheries. The EIS should consider modifications to Folsom and Nimbus Dams to provide better temperatures and flows in the lower river.

- Consideration should be given to installing a small powerplant on one of the low-level outlet gates to eliminate the conflict between (a) power generation, and (b) power-bypass in order to be able to tap the deep cold-water pool as a means to better manage river temperatures. In the absence of a small powerplant, a power-bypass should be required to be implemented if temperature targets are projected to not being met.

- The incremental temperature selection computer model, which is used to manage the cold-water pool in Folsom Reservoir, should be revised to optimize a greater range of hydrologic conditions.

- The operations and physical infrastructure of the Nimbus hatchery should be reevaluated, given climate changes' warmer temperatures, lower flows, and impacts to fishery genetics. This reevaluation should consider improved temperature management for the hatchery.

- Consideration should be given to fin clipping all young hatchery fish and returning unclipped adult fish to the downstream river, hopefully to spawn in the river.

- Hydrologic conditions have exceeded the expectations at the time that contractual shortage provisions were made for the Sacramento Valley Settlement Contractors. The Operations Plan should provide for more realistic shortage provisions.

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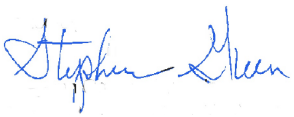

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March 30, 2022

VIA E-MAIL

Bureau of Reclamation
Attention: Cindy Meyer
801 I Street, Sacramento, CA 95814-2536
E-mail: sha-MPR-BDO@usbr.gov

Re: Reinitiation of Consultation on the Biological Opinions for the CVP/SWP

Dear Ms. Meyer:

Please accept these comments on the Bureau of Reclamation's (Reclamation) Reinitiation of Consultation on the Long-term Operation of the Central Valley Project (CVP) and State Water Project (SWP). Grassland Water District (GWD) is a refuge water supply contractor of the CVP, and receives water pursuant to section 3406(d) of the Central Valley Project Improvement Act (CVPIA). GWD also conveys water to other refuge contractors, and is deeply invested in achieving the full Level 4 refuge water supply mandates of the CVPIA. We have the following comments.

(1) Inclusion of Full Refuge Water Deliveries in the Proposed Action. During the most recent reinitiation effort, GWD worked with Reclamation to include language to clarify that the proposed action covered full delivery of contractual CVPIA refuge water supplies, including Level 2 and Incremental Level 4 refuge water. Although Incremental Level 4 water comes from a variety of sources and may be difficult to include in technical modeling efforts, it is important that the proposed action contemplates full Level 4 water deliveries in order to achieve CVPIA and contractual refuge water supply goals.

(2) Wetland Impacts from Sacramento River Temperature Management Actions. GWD is increasingly concerned about the negative impacts that temperature management for salmon in the Sacramento River will have on migratory waterfowl and wetland habitat. In previous years, such salmon conservation efforts were entirely compatible with refuge water deliveries and winter-flooded rice practices in the Sacramento Valley, which provide more than two-thirds of habitat and food requirements to support migratory waterfowl and other waterbirds in California. The Central Valley is one of the most important wintering grounds for migratory birds on the North American continent. The United States maintains habitat and water delivery objectives

through the Central Valley Joint Venture (CVJV) Implementation Plan. In addition to the CVPIA, the CVJV Implementation Plan helps ensure compliance with our Nation's commitments under the North American Waterfowl Management Plan, which is an international treaty that identifies the Central Valley as one of six priority habitat areas for North American waterfowl.[1]

We believe that wetland habitat should receive a high priority in CVP and SWP operations, and any proposed changes in operations should analyze and attempt to mitigate adverse impacts on achieving waterfowl habitat objectives in the Central Valley. GWD requests that the proposed action incorporate a description and analysis of CVPIA refuge water supply goals and the objectives of the CVJV Implementation Plan. Direct consultation with the CVJV is encouraged. Projected water deliveries that help meet the objectives of the CVPIA and CVJV Implementation Plan should be included in the proposed action, in addition to water needed for fish, agriculture, and municipal and industrial uses.

(3) Impacts as a Result of Reduced CVPIA Restoration Fund Collections. Reduced water supply and power allocations to CVP contractors will also result in reduced collections to the CVPIA Restoration Fund, which in turn has negative environmental impacts from reduced delivery of CVPIA environmental compliance programs (refuge water, anadromous fish restoration, and others). Reclamation also recently proposed, but did not adopt, draft policy guidelines affecting the Restoration Fund. The proposed action should address strategies to maintain at least historic levels of funding for the Restoration Fund.

(4) Impacts as a Result of San Luis Reservoir Refuge Water Storage Policies. The long-term operation of the CVP and SWP includes the operation of San Luis Reservoir. In recent years, Reclamation has greatly restricted the volume and timing of refuge water that can be carried over from winter into spring, which historically helped address the lack of available Incremental Level 4 refuge water for spring wetland irrigations. Reclamation should analyze and mitigate for the negative impacts of reduced carryover storage for refuge water supply contractors in San Luis Reservoir.

As a CVP contractor, we would appreciate the opportunity to consult with Reclamation on the development of the proposed action. Thank you for considering these initial comments. If you have any questions, please feel free to contact me at 209-826-5188 or rortega@gwdwater.org.

Sincerely,

Ricardo Ortega
General Manager

[1] CVJV 2020 Implementation Plan, Chapter 4.2, *available at*: https://www.centralvalleyjointventure.org/assets/pdf/CVJV_2020%20Implementation%20Plan.pdf

Phone No. (661) 634-1400

Mailing Address
3200 Rio Mirada Drive
Bakersfield, CA 93308

March 30, 2022

VIA E-MAIL sha-MPR-BDO@usbr.gov

Maria Camille Calimlim Touton
Commissioner
Bureau of Reclamation
Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

Re: Notice of Intent To Prepare an Environmental Impact Statement on the Long-Term Operation of the Central Valley Project and State Water Project, 87 Fed. Reg. 11093 (Feb. 28, 2022)

Dear Commissioner Touton:

We, the Kern County Water Agency (Agency), write to provide our views in response to the Notice of Intent (NOI) To Prepare an Environmental Impact Statement (EIS) on the Long-Term Operations of the California State Water Project (SWP) and the Central Valley Project (CVP) published by to the Bureau of Reclamation (Reclamation) in the Federal Register on February 28, 2022. Continued operations of the SWP and CVP are essential to Californians served by Kern County Water Agency and other water agencies across the state as they provide water to millions of agricultural, municipal, and industrial users thereby powering our economy.

The obligation to prepare an EIS is a direct consequence of, and is integrally related to, Reclamation's decision to reinitiate consultation under section 7(a)(2) of the Endangered Species Act (ESA), 16 U.S.C. § 1536(a)(2). As you know, at the time Reclamation requested reinitiation, in September 2021, Kern County Water Agency promptly submitted a request to participate in the consultation, attached hereto as Attachment I. Regrettably, Kern County Water Agency has not yet received any formal acknowledgement of, or response to its request. Moving forward, the Agency reiterates its request to be included in the consultation process, consistent with the ESA and the Water Infrastructure Improvements for the Nation (WIIN) Act, and also requests to be included in the environmental review process consistent with the National Environmental Policy Act (NEPA), 42 U.S.C. § 4321 *et seq*.

The NOI describes the project purpose and need. The Council on Environmental Quality (CEQ) regulations to implement NEPA require inclusion of the project purpose and need in an EIS. 40 C.F.R. § 1502.13. But Reclamation does not plainly state in the NOI that these multiple-use water projects are primarily water supply projects that are paid for by local water agencies with long-term water supply contracts with Reclamation and the Department of Water Resources. Acknowledgement of this fact is important because the scope of the project purpose and need influences the range of alternatives that Reclamation should consider in preparing its EIS. Any alternative that fails to recognize water supply as the primary use of the CVP and SWP should be screened from detailed consideration because it would be inconsistent with the project purpose and need.

> The NOI states, with respect to the alternatives to be analyzed:
>
> The EIS will consider a range of reasonable alternatives, consistent with 40 CFR 1502.14, including a No Action Alternative that would continue implementation of the 2020 ROD. Reasonable alternatives may include combinations of operation of CVP and SWP facilities and diversions, construction actions, habitat restoration, conservation hatchery practices, and monitoring and special studies.

87 Fed. Reg. at 11094. In light of the size and complexity of the SWP and CVP, we urge Reclamation to give consideration to alternatives that vary operations in a manner that will allow Reclamation to mix and match components in order to select an alternative that is consistent with the project purpose and need and has the greatest overall benefits relative to costs. Examples of components that should be explored during the environmental review process are:

- Inclusion of alternative Shasta cold-water pool management strategies to protect winter-run Chinook salmon while minimizing water supply losses. For example, providing the coldest water during the last half of the egg incubation period (when eggs are most sensitive to water temperature), rather than attempting to provide the coldest water from the very beginning of egg incubation.

- Collaboration with the State to alter existing Chinook salmon and steelhead hatchery practices in ways that would benefit wild populations of these species. For example, current practices that do not include sufficient natural origin fish in hatchery brood stock and allow excess hatchery-produced fish to spawn in-river are impairing the productivity and fitness of remaining wild-origin populations.

- Inclusion of broader non-native predator control strategies to benefit smelt and salmonids. This could be accomplished by changing recreational harvest regulations to encourage harvest of size classes and species of predators most likely to prey upon smelt and salmonids.

- Inclusion of more relaxed storm-flex and /risk- based provisions during high flow periods to provide water supply benefits without causing population-level adverse effects on smelt and salmonids.

- Elimination of a summer-fall outflow action to provide water supply benefits without causing population-level adverse effects on delta smelt.

- Development of flow-through managed wetlands in Suisun Marsh and Grizzly Island to substantially increase food production for smelt in Suisun Marsh, Honker Bay and northern Suisun Bay.

- Substantially more inundation of Yolo bypass than would be achieved by the “Big Notch” project.

Such an approach is consistent with Reclamation's stated intention to evaluate combinations of operational and non-operational actions. Longstanding CEQ guidance clearly explains that the range of alternatives Reclamation is obliged to consider "includes all reasonable alternatives, which must be rigorously explored and objectively evaluated." 46 Fed. Reg.18026 (March 23, 1981).

The analysis of impacts (or environmental consequences) is at the heart of the environmental review process. 42 U.S.C. § 4332(C)(1); 40 C.F.R. § 1502.16. Rigorous impacts analysis is a stepwise, structured process. In this context, impacts analysis should be embedded in an adaptive management framework. Department of the Interior guidance explains the circumstances in which agencies should utilize adaptive management:

> Adaptive management is warranted when there are consequential decisions to be made, when there is an opportunity to apply learning, when the objectives of management are clear, when the value of reducing uncertainty is high, when uncertainty can be expressed as a set of competing, testable models, and when a monitoring system can be put in place with a reasonable expectation of reducing uncertainty.

Byron K. Williams et al., *Adaptive Management: the U.S. Department of the Interior Technical Guidance*, p. 9 (2009).

Adaptive management cannot succeed unless it is embraced at the outset of the environmental review process and carried through that process to implementation. Dennis D. Murphy and Paul S. Weiland, Science and structured decision making: fulfilling the promise of adaptive management for imperiled species, 4 *Journal of Environmental Studies & Sciences* 200 (2014). Further, implementation must include monitoring to facilitate the assessment of the effectiveness of actions taken and to inform the determination whether to continue those actions, adjust them, or abandon them altogether. Both conceptual and operational models must be utilized to inform the impact analysis in an adaptive management framework. Therefore, we urge Reclamation to draw on these tools to inform its impacts analysis.

In addition, we urge Reclamation to give due consideration to socioeconomic effects of the alternatives analyzed. The CEQ regulations explain that "when the agency determines that economic or social and natural or physical environmental effects are interrelated, the environmental impact statement shall discuss and give appropriate consideration to these effects on the human environment." 40 C.F.R. § 1502.16(b). The socioeconomic effects associated with Reclamation's decision how to operate the CVP in coordination with the SWP are of statewide and, in fact, national significance.

Finally, in addition to the comments herein, we endorse the comments of the State Water Contractors, Inc. with respect to the NOI. We appreciate the opportunity to comment on the NOI, and we look forward to continuing to work with Reclamation to ensure the environmental review process is rigorous and transparent.

Sincerely,

Thomas D. McCarthy
General Manager

cc: Karla Nemeth, Director, California Department of Water Resources

Enclosure

Phone No. (661) 634-1400

Mailing Address
3200 Rio Mirada Drive
Bakersfield, CA 93308

September 29, 2021

VIA EMAIL [econant@usbr.gov] **& U.S. MAIL**

Ernest Conant, Regional Director
U.S. Bureau of Reclamation
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, CA 95825-1898

Re: Request for Participation in the U.S. Bureau of Reclamation Consultation Process

Dear Mr. Conant:

As the attached letter makes clear, Kern County Water Agency (Agency) asked to be included by the Bureau of Reclamation (Reclamation) in consultation under section 7(a)(2) of the Endangered Species Act (ESA), 16 U.S.C. 1536(a)(2), on the coordinated long-term operations of the Central Valley Project and State Water Project and any subsequent reinitiation of consultation or further consultation. This request was made pursuant to section 4004 of part II, Subtitle J of Pub. L. No. 114-322 (2016) of the Water Infrastructure Improvements for the Nation (WIIN) Act. The Agency participated in consultation that resulted in the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (FWS) Biological Opinions for the Reinitiation of Consultation on the Coordinated Operations of the Central Valley Project and State Water Project, both dated October 2019.

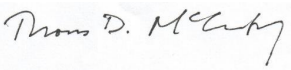
The Agency is aware that Reclamation and other federal and state agencies recently developed and circulated an interim operations plan that deviates from the 2019 Biological Opinions. The plan was developed without the involvement of the Agency as required by section 4004 of the WIIN Act.

In addition to the interim operations plan, Reclamation has indicated that it will reinitiate consultation beginning on October 1, 2021. However, the reason for Reclamation's decision to reinitiate consultation is not clear. The criteria for reinitiation are identified in the consultation regulations, 50 C.F.R. 402.16, and the 2019 Biological Opinions, and we are not aware that any of them have been triggered.

We request that Reclamation include the Agency in any ESA consultation regarding the State Water Project, and we question the appropriateness of implementing the proposed interim operations plan without first engaging the public water agencies and completing consultation under section 7(a)(2) of the ESA because the proposed actions would affect listed species without the benefit of effects analyses prepared by NMFS and FWS.

Please do not hesitate to contact me if you have any questions.

Sincerely,



Thomas D. McCarthy
General Manager

cc: Karla Nemeth, Director, California Department of Water Resources

Enclosure

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February 8, 2017

David Murillo, Regional Director
U.S. Bureau of Reclamation
Mid-Pacific Regional Office
Federal Office Building
2800 Cottage Way
Sacramento, CA 95825-1898

Re: Request for Participation in the U.S. Bureau of Reclamation Consultation Processes

Dear Mr. Murillo:

Pursuant to section 4004 of part II, Subtitle J of Pub. L. No: 114-322 (2016) of the Water Infrastructure for the Nation Act (WIIN Act), Kern County Water Agency (Agency) hereby seeks to participate in the Mid-Pacific Region's consultation under Section 7 of the Endangered Species Act for the California WaterFix and Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project (CVP) and the State Water Project (SWP) (ROC), as well as all subsequent consultations or reinitiations of consultation on the operation of the CVP or SWP. This letter also serves as the Agency's response to Ms. Banonis' email of December 15, 2016, and accepts her invitation to participate in the ROC as a Designated Non-Federal Representative.

The Agency notes that the privileges and responsibilities accorded to Non-Federal Representatives are substantially more limited than those afforded to public water agencies under section 4004 of the WIIN Act. It is clear that section 4004 is intended to establish privileges and responsibilities in addition to those that were available to public water agencies prior to passage of the WIIN Act.

Consistent with the language and intent of section 4004, the Agency believes public water agencies that make a request under section 4004 should be included as parties in the Memorandum of Understanding for the Reinitiation of Consultation on the Coordinated Long-Term Operation of the Central Valley Project and the State Water Project (MOU) along with the Mid-Pacific Region and the California Department of Water Resources.

Thank you for your time and attention to this change in how CVP and SWP compliance with Section 7 is managed.

Sincerely,

Curtis Creel
General Manager

cc: California Department of Water Resources Acting Director William Croyle
U.S. Bureau of Reclamation Mid-Pacific Region Bay Delta Office Manager Michelle Banonis

March 30, 2022

Cindy Meyer
Bureau of Reclamation, Bay-Delta Office
801 I Street, Suite 140
Sacramento, CA 95814–2536

Sent via email to sha-MPR-BDO@usbr.gov

RE: Scoping Comments Regarding the Reinitiation of Consultation on Long-Term Operations of the Central Valley Project and State Water Project

Dear Ms. Meyer:

On behalf of the Natural Resources Defense Council, Defenders of Wildlife, San Francisco Baykeeper, The Bay Institute, Golden State Salmon Association, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, Save California Salmon, and Restore the Delta, we are writing to provide scoping comments regarding the reinitiation of consultation on long-term operations of the Central Valley Project ("CVP") and State Water Project ("SWP"). These comments address both Reclamation's compliance with the National Environmental Policy Act and compliance with the Endangered Species Act. These comments are being transmitted to the National Marine Fisheries Service and U.S. Fish and Wildlife Service and should be included in all three agencies' administrative records.

I. Purpose and Need:

While we appreciate that Reclamation has not included the unlawful purpose and need statement that was used in the last consultation, the purpose and need statement fails to comply with federal law and must be revised.

First, we appreciate that Reclamation's proposed purpose and need statement does not include the unlawful directive to "maximize water deliveries" that was included in the Trump Administration's unlawful section 7 consultation. The prior consultation's purpose and need was contrary to state and federal law, and that project purpose was a primary reason why threatened

and endangered fish species are facing potential extinction in the current drought, as water project operators chose to maximize water deliveries instead of preserving water in storage to meet water supply and environmental obligations if the next year was dry. Under the 1992 Central Valley Project Improvement Act ("CVPIA"), protecting fish and wildlife – including a program to double the natural production of fall-run Chinook salmon, which are the backbone of the State's salmon fishery that supports thousands of fishing jobs in California, Oregon, and parts of Washington – is an equal project purpose to making water deliveries pursuant to water supply contracts.

Second, the purpose and need statement improperly omits Reclamation's obligation to comply with State law, which is not limited to "State of California water rights, permits, and licenses pursuant to section 8 of the Reclamation Act" as stated in the Notice of Intent.[1] Bureau of Reclamation, Notice of Intent To Prepare an Environmental Impact Statement and Hold Public Scoping Meetings on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project, 87 Fed. Reg. 11093, 11094 (Feb. 28, 2022) ("NOI"). The CVPIA requires that,

> The Secretary, immediately upon the enactment of this title, shall operate the Central Valley Project to meet all obligations under state and federal law, including but not limited to the federal Endangered Species Act, 16 U.S.C. s 1531, et seq., and all decisions of the California State Water Resources Control Board establishing conditions on applicable licenses and permits for the project.

P.L. 102-575, § 3406(a). Pursuant to the CVPIA, Reclamation must comply with the California Endangered Species Act regarding the effects of CVP operations on fish species in the Bay-Delta watershed. Reclamation's purpose and need statement wholly ignores these obligations under the CVPIA. The coordinated operations of the CVP and SWP also must comply with state water rights obligations, including Vernalis pulse flows under D-1641, and the agencies must plan to comply with updated water quality objectives that were adopted by the State Water Resources Control Board in 2018 and that are required to be fully implemented by 2023. *See* Cal. Code Regs., tit. 23, § 3002.1.

Moreover, the NOI does not explicitly reference Reclamation's obligation to comply with the CVPIA, including section 3406(b)(2) of the CVPIA. This is particularly problematic because in recent years the Secretary of the Interior has breached the legal obligation to dedicate the volume of water specified under section 3406(b)(2) of the CVPIA, including in 2011, 2014, 2015, 2017, and 2019. Reclamation has not yet produced CVPIA section 3406(b)(2) accounting for years

[1] We note that Reclamation continues to breach its obligations under its state water rights, including violations of D-1641 Vernalis pulse flows (as reinforced in the State Water Resources Control Board's letter to Reclamation dated March 8, 2022), violations of D-1641 Delta outflow requirements in April 2021, and violations of Order 90-5.

2020, 2021, and 2022, despite repeated requests from NRDC to provide the accounting for 2020 and 2021, and it is unclear whether Reclamation has met its obligations in these years as well. Reclamation must ensure full compliance with the CVPIA, including dedicating the full volume of water required under section 3406(b)(2), in this consultation. This should help to ensure that protection for fall-run Chinook salmon is treated as an equal project purpose with the CVP's water supply purpose, as required by the CVPIA.

Third, the NOI states that the purpose and need statement includes operating the CVP and SWP in a manner that "Satisfies Reclamation contractual obligations and agreements." However, the United States has never engaged in a lawful section 7 consultation on the execution of the Sacramento River Settlement Contracts (nor the Delta Mendota Canal contracts), and Reclamation would violate the ESA if it chose to meet alleged obligations pursuant to those contracts in a manner that jeopardizes species listed under the ESA. Moreover, in 2019 the District Court for the Eastern District of California held that "the SRS Contracts must be subject to future restrictions imposed in future OCAP BiOps" to protect listed species, explaining that,

> Defendants cannot have it any other way. Either the present consultation fails because the analysis incorporated from the 2008 OCAP BiOp fails to evaluate the entire temporal scope of the SRS Contracts, or the SRS Contracts must be subject to future restrictions imposed by future OCAP BiOps. The 2015 LOC, and Reclamation's reliance on it, makes it clear that Federal Defendants have elected the latter. What such a scenario might mean for Reclamation from a contract law perspective is beyond the scope of the present case.

Natural Res. Def. Council v. Bernhardt, 2019 WL 937872, E.D. Cal., Feb. 26, 2019, at * 27 (Dkt. 1314). The CVP and SWP's obligations to fulfill the terms and conditions of water supply contracts are subservient to Reclamation's obligation to ensure that the coordinated operations of the CVP and SWP comply with the ESA, and the purpose and need statement must be clarified to make clear that meeting water supply contracts is a secondary project purpose after compliance with the ESA.

In addition, we strongly encourage Reclamation to revise the purpose and need to more explicitly recognize that protections for ESA-listed species must be strengthened to avoid jeopardizing the continued existence and recovery of the species. The best available science continues to demonstrate that substantially greater protections for endangered species are required, including actions that will likely reduce water diversions, as the Secretary of the Interior concluded in 2016 (actions which were not included as part of the prior, unlawful consultation). The State of California, as well as the Plaintiffs in *PCFFA v. Haaland* (including the Court testimony provided by Dr. Jon Rosenfield in 2020 and 2021), have demonstrated that significantly improved protections beyond those included in the 2020 Record of Decision are necessary to ensure that the operations of the CVP and SWP do not jeopardize listed species and violate State and federal law.

Finally, the purpose and need statement cannot be interpreted to exclude consideration of alternatives that would reduce water deliveries, water allocations and/or water diversions by the CVP and SWP and its contractors. Coordinated operations of the CVP and SWP that reduce water diversions are consistent with Reclamation's legal obligations, and defining the purpose and need so narrowly as to exclude these reasonable alternatives is unlawful. *See, e.g., Environmental Protection Information Center v. U.S. Forest Service*, 234 Fed. Appx. 440 (9th Cir. 2007).

II. Environmental Baseline / No Action Alternative:

The NOI improperly identifies the No Action Alternative as continued operations pursuant to the 2020 Record of Decision. However, Reclamation has already stopped implementing the operations authorized in the Record of Decision, and the coordinated operations of the CVP and SWP are governed by the Interim Operations Plan approved by the federal court.[2] Because the 2020 Record of Decision is not the current management direction, it is inappropriate and misleading to use it as the environmental baseline. *See, e.g.*, Council on Environmental Quality, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Fed. Reg. 18026 (March 23, 1981) ("In these cases 'no action' is 'no change' from current management direction or level of management intensity."); *accord*, 43 C.F.R. §46.30 (definition of No Action Alternative).

Moreover, coordinated operations of the CVP and SWP have and are continuing to violate the terms of the 2019 biological opinions and Record of Decision, including: (1) exceeding the incidental take statement for steelhead on the American River in 2021 (likely again in 2022); (2) almost certainly exceeding the incidental take statement for winter-run Chinook salmon in 2022; and (3) violating D-1641 water quality objectives that were part of the proposed action in 2021 and 2022 in a manner that causes additional impacts to listed species that were not considered in the 2019 biological opinions or Record of Decision. Continued operations under the 2020 Record of Decision would jeopardize listed species in violation of the ESA.[3] As a result, and because Reclamation is not currently implementing the Record of Decision, using the coordinated operations of the CVP and SWP pursuant to the 2020 Record of Decision as the environmental baseline would subvert the purposes of NEPA and would be plainly misleading to the public and decisionmakers.

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[2] In addition, the SWP's operations are also governed by its CESA incidental take permit, which is not explicitly accounted for under this proposed No Action Alternative.

[3] Plaintiffs in *PCFFA v. Raimondo* demonstrated that water project operations under the Interim Operations Plan have and would violate the incidental take statement in the 2019 biological opinions and would jeopardize listed species, and neither state nor federal agencies disputed Plaintiffs' conclusions in court. As a result, Reclamation and DWR cannot now claim that operations under the Interim Operations Plan are sufficient to avoid causing jeopardy.

III. Range of Alternatives:

As the NOI notes, NEPA requires that Reclamation consider a reasonable range of alternatives. 42 U.S.C. § 4332; 40 C.F.R. §§ 1502.14, 1508.25(b). And as noted above, because the coordinated operations of the CVP and SWP under the 2020 Record of Decision are jeopardizing ESA-listed species, and because the execution of the Sacramento River Settlement Contract has never been subject to a valid section 7 consultation, the range of alternatives cannot exclude alternatives that result in significant reductions in water deliveries to, water diversions by, and water allocations for the contractors of the SWP and CVP, potentially including Settlement and Exchange Contractors. In light of these facts, and in order to evaluate a reasonable range of alternatives, Reclamation must model and analyze one or more alternatives that include reductions in water diversions by the Sacramento River Settlement Contractors that are greater than provided for in the existing contracts.

We appreciate the opportunity to work with Reclamation to help develop the proposed action and alternatives in this consultation.

IV. Scope of the Consultation Cannot Include Potential New Infrastructure that is Speculative and Not Reasonably Certain to Occur:

The NOI states that the DEIS may consider "Potential new storage, conveyance, and other water supply infrastructure" in this consultation. We strongly recommend that Reclamation exclude the potential Delta Conveyance Project and potential Sites Reservoir project from being included in the section 7 consultation and in the DEIS, except in the DEIS's analysis of cumulative impacts.

First, at this time both of these projects are speculative and are not reasonably certain to occur, and it would therefore be unlawful to include either of them in a biological opinion. Neither project is reasonably foreseeable to be permitted (including issuance of necessary water rights from the State Water Resources Control Board) before this consultation is concluded in 2024. For instance, the State Water Resources Control Board noted in their January 28, 2022 comments on the RDEIR/SDEIS for Sites Reservoir that, "A hearing may take several years to complete," that "the Authority should be prepared to accommodate a process that is likely to take longer to complete than 18 months," and that unless additional modeling of alternative operations is included in an EIS/EIR, "supplemental analyses may be needed, which could result in longer processing timelines for the Sites water right application and could delay other decisions by the Water Boards." Similarly, the water rights proceeding for the California WaterFix project – which never reached its conclusion, as the water rights petition for the project was withdrawn before conclusion of the hearing – took more than 3 years (from the November 2, 2015 notice of the petition to the May 2, 2019 notice of withdrawal of the water rights petition). Because these projects are not likely to be permitted prior to conclusion of this consultation, it is inappropriate to include them as part of the alternatives or proposed action.

In addition, including the operations of either project in this consultation and EIS/EIR would be extremely confusing and cause unnecessary complexity because even if one or both projects were to move forward, neither project would be operational for at least a decade. *See* Army Corps of Engineers, Notice of Intent to Prepare and Environmental Impact Statement for construction of the Proposed Delta Conveyance Project, 85 Fed. Reg. 51420, 51421 (Aug. 20, 2020) (noting that the EIS would only analyze construction of the facility, which was estimated to take 13 years to complete if approved).[4] As a result, the DEIS would have to analyze one set of facilities and operations during the first 10-plus year period covered by the DEIS, and have a different set of facilities and operations in the remaining years analyzed in the DEIS.

Finally, the temporal scope of biological opinions resulting from this section 7 consultation (through the year 2040) is inadequate to evaluate the long term effects of these potential new infrastructure projects, which would operate for decades after this date. Both the Sites Reservoir and Delta Conveyance projects require evaluation of effects over much longer terms than through the year 2040.

Because these projects are not reasonably certain to occur, because their inclusion in the DEIS would cause unnecessary complexity and confusion, and because the temporal scope of this consultation is not aligned with the consultation necessary for these projects, the Sites Reservoir and Delta Conveyance projects should not be included in the section 7 consultation or DEIS, except as part of a cumulative impact analysis.

V. Developing a Plan for Droughts that Does not Violate Minimum Water Quality Objectives:

Rather than planning to fail to protect water quality, fish and wildlife during droughts as suggested in the NOI, Reclamation and DWR should develop a plan that protects the environment and communities during droughts as part of this consultation. We are deeply concerned that the NOI states that all of the alternatives will be analyzed under conditions including, "Potential responses to drier years and drought conditions such as… temporary urgency change petitions." While we recognize that Reclamation and DWR have violated water quality objectives in the Bay-Delta Water Quality Control Plan pursuant to Temporary Urgency Change Petitions ("TUCPs") in 2014, 2015, 2016, and 2021, and have a pending TUCP to do so again in 2022, these violations of water quality objectives have caused devastating impacts to Delta Smelt and other listed species, as well as contributing to harmful algal blooms in the Delta that DWR scientists have warned threaten human health and safety.

[4] Our understanding is that Reclamation is not participating in the Delta Conveyance project and that this project would not be part of the coordinated operations of the CVP and SWP. *Id.*

Reclamation and DWR must develop a plan for meeting minimum water quality objectives during droughts, rather than assuming that the projects will be allowed to violate water quality objectives through TUCPs in future droughts. The use of TUCPs to violate water quality objectives is unlawful under state law. *See* Cal. Water Code § 13247. While the Governor has asserted authority under the California Emergency Services Act to suspend application of section 13247 of the Water Code, no court has confirmed this authority, let alone the authority to do so in all future critically dry years.

The NOI suggests that Reclamation and DWR's "plan for droughts" is simply to violate water quality objectives in every drought year. The only thing worse than a "failure to plan" for droughts is a "plan for failure": a plan to fail to protect water quality, fish, and wildlife – and the people and communities that depend on them – during droughts. To the extent that Reclamation's and DWR's "plan for droughts" is to rely on continued TUCPs to violate minimum water quality standards without petitioning the State Water Resources Control Board to modify the objectives, it demonstrates a failure to exercise due diligence, constitutes an unreasonable use of water, threatens human health and safety for communities in Stockton and other parts of the Delta, and violates the Public Trust. DWR and Reclamation's pattern and practice of violating water quality objectives during droughts is fundamentally incompatible with these agencies' request that the public and stakeholders trust that new infrastructure would be operated responsibly and would comply with environmental standards.

VI. Accurately Analyzing the Effects of Climate Change:

We are pleased that Reclamation has publicly stated that it will use CALSIM 3 for the modeling and analysis in the DEIS and consultation. It is clear that modeling and analysis using CALSIM II fails to accurately represent current hydrology in light of the effects of climate change, let alone hydrology through the year 2040 (as the effects of climate change become more severe than today). CALSIM II excludes the years 2004-2021 from the hydrologic record, and we strongly encourage Reclamation to include hydrology through 2021 in its CALSIM 3 modeling.

In addition, given that climate change is resulting in more frequent and severe drought conditions, and that operations during droughts have caused devastating effects on ESA-listed species, the DEIS and section 7 consultation should specifically model and analyze effects during multi-year droughts like 2012-2016, to ensure that Reclamation and DWR can meet water quality objectives and water rights obligations as well as avoiding jeopardy to the species.

VII. Inclusion of Longfin Smelt in the Section 7 Consultation:

We encourage the federal agencies to analyze the effects of coordinated operations of the CVP and SWP on Longfin Smelt in this section 7 consultation. Although Longfin Smelt is not currently listed under the federal Endangered Species Act (while being listed as threatened under the California Endangered Species Act), it is a candidate species, the U.S. Fish and Wildlife

Service has previously concluded that ESA listing is warranted, and the agency is currently reevaluating whether to list the species under the ESA. *See* U.S. Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants; Review of Domestic Species That Are Candidates for Listing as Endangered or Threatened; Annual Notification of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions, 85 Fed. Reg. 73164, 73173-74 (Nov. 16, 2020). Because it is likely that the species will be listed under the federal ESA prior to the conclusion of this consultation, analyzing the impacts on Longfin Smelt in this section 7 consultation is appropriate to ensure a more durable biological opinion.

VIII. Development of the Proposed Action, Including Development of Quantifiable Biological Objectives and Analytical and Modeling Tools:

Finally, rather than selecting a politically motivated proposed action (as occurred in the prior consultation), we encourage the U.S. Fish and Wildlife Service and National Marine Fisheries Service ("NMFS") to develop quantitative biological objectives to help guide development of the proposed action and alternatives in this consultation. For instance, NMFS should update and/or develop biological objectives for key life stages of winter-run Chinook salmon that are sufficient to result a positive cohort replacement rate under a range of hydrologic conditions (including multi-year droughts), including: (1) temperature dependent mortality, and egg to fry survival; (2) juvenile survival down the Sacramento River; (3) and juvenile survival through the Delta. NMFS has previously identified quantitative objectives for some of these life stages, including temperature dependent mortality and egg to fry survival in the 2017 Shasta RPA Amendment, and through-Delta survival objectives as part of the Bay-Delta Conservation Plan.

In addition, unlike what occurred in the prior consultation (where key biological modeling was not included as part of the biological assessment), the development of the proposed action should be informed by, and the biological assessment should include, biological modeling and analysis using the best available science, including:

- Modeling of temperature dependent mortality of winter-run Chinook salmon using the RAFT and NMFS model (formerly known as the Martin model);
- Analysis of the effects of Sacramento River flow on survival of juvenile migrating salmon, including Henderson et al 2018, Munsch et al 2020, Michel et al. 2021 and Hassrick et al. 2022;
- NMFS' Winter-Run Life Cycle Model;
- Delta Smelt Life Cycle Model;
- Nobriga and Rosenfield 2016 (Longfin Smelt life cycle model);
- STARS Model (effects of flows and Delta Cross Channel gate operations on juvenile salmon survival through the Delta).

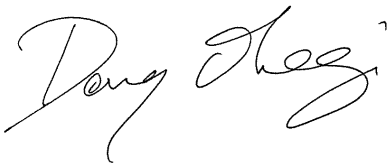
Before finalizing a proposed action for this section 7 consultation, the agencies should analyze proposed operations using these models to evaluate whether the operations would achieve biological objectives that are sufficient to avoid jeopardy.

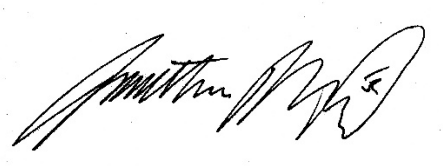
Finally, because Water Project operations under the 2020 Record of Decision – and/or Water Project operations pursuant to the Interim Operations Plan – are inadequate to avoid jeopardizing ESA-listed species, simply showing that effects of the proposed action are similar to or not worse than the environmental baseline is inadequate to meet obligations under the ESA. This comparative approach to modeling is inadequate where, as here, baseline operations of the CVP and SWP are jeopardizing listed species.

The question in this section 7 consultation is not whether a new operations plan is as protective of listed species as water operations under the environmental baseline, but rather whether, based on the best scientific and commercial information available, and in light of baseline conditions (including climate change), proposed Water Project operations will jeopardize the continued existence of the species or destroy or adversely modify its critical habitat. *See Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 524 F.3d 917, 926 (9th Cir. 2008). In fact, courts have previously held that even stating that protections will increase as compared to the status quo is not sufficient to demonstrate that the action will not jeopardize listed species without more analysis and explanation, because even under increased protections an action can jeopardize a species that has severely declined. *See, e.g., Aluminum Co. of Am. v. Adm'r, Bonneville Power Admin*., 175 F.3d 1156, 1162 n.6 (9th Cir. 1999) (given imperiled status of the species, minor improvements in survival compared to prior operations may be insufficient to avoid jeopardy); *Turtle Island Restoration Network v. U.S. Dep't of Commerce,* 878 F.3d 725, 737 (9th Cir. 2017) (even small additional harms can jeopardize the species when population is declining under baseline conditions); *S. Yuba River Citizens League v. Nat'l Marine Fisheries Serv.*, 723 F.Supp.2d 1247, 1267 (E.D. Cal. 2010) ("[A]lthough the BiOp properly concludes that the project … will partially reduce the impact of prior stressors, this is itself insufficient."); *Nat. Res. Def. Council v. Kempthorne*, 506 F.Supp.2d 322, 371–72 (E.D. Cal. 2007). Rather than simply performing comparative modeling in this consultation, life cycle models and/or other analyses should be used to demonstrate whether alternatives would achieve positive population growth of ESA-listed species sufficient to avoid jeopardizing the continued existence and recovery of the species.

Thank you for consideration of our views.

Sincerely,



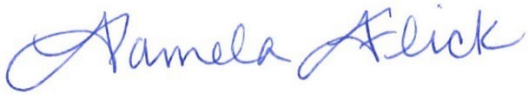


Doug Obegi
Natural Resources Defense Council

Jon Rosenfield, Ph.D.
San Francisco Baykeeper

John McManus
Golden State Salmon Association

Mike Conroy
Pacific Coast Federation of Fishermen's Associations and Institute for Fisheries Resources



Pamela Flick
Defenders of Wildlife

Regina Chichizola
Save California Salmon

Barbara Barrigan-Parilla
Restore the Delta

Gary Bobker
The Bay Institute

cc: Cathy Marcinkevage, National Marine Fisheries Service

Kaylee Allen, U.S. Fish and Wildlife Service

March 29, 2022

Cindy Meyer, Project Manager
Bureau of Reclamation, California-Great Basin
Bay-Delta Office
801 I Street
Sacramento, CA 95814-2536

Re: Comments in Response to Notice of Intent to Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project, 87 FR 11093

Dear Cindy:

Thank you for the opportunity to provide scoping comments for the preparation of the Environmental Impact Statement on the 2021 Endangered Species Act reinitiation of Section 7 consultation on the long-term operation of the Central Valley Project (CVP) and State Water Project (SWP). The agencies that are providing these comments rely on water supplies diverted from the American River, contract for the delivery of water with Reclamation, and are signatories to the Water Forum Agreement, under which a coalition of cities, counties, water suppliers, environmental groups, business organizations, and public stakeholders agreed to work together to manage the region's water resources to meet two co-equal objectives:

- Provide a reliable and safe water supply for the region's economic health and planned development to the year 2030; and
- Preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River.

We appreciate the continued success we have had in implementing these important objectives with the Water Forum and with Reclamation. This has included the important milestone of the 2019 Biological Opinions including the Modified Flow Management Standard (MFMS). The MFMS has attempted to strike a balance between ensuring reliable water supply deliveries and providing adequate cold water for fish in the American River. This arrangement to implement the MFMS has been memorialized further by the Memorandum of Understanding (MOU) between the Water Forum and Reclamation that provides for a schedule of minimum flow requirements for the Lower American River, a temperature management plan for water releases from Folsom Dam and Nimbus Dam, and an end-of-December planning minimum lake level for Folsom Reservoir.

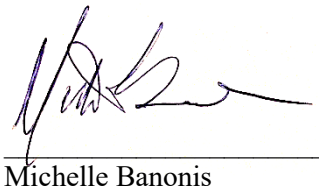
Given the interests stated above, we would like to offer the following comments. First, we realize that water years 2021 and 2022 have been difficult due to prolonged dry conditions. We also understand that the CVP and SWP need to meet multiple, sometimes competing, obligations. Conditions in 2021 proved challenging for meeting fisheries conditions on the American River, resulting in river conditions that exceeded the requirements set forth in the Biological Opinions for Central Valley steelhead. As a result, we believe that modifications to the MFMS may be needed in order to provide adequate protection in the American River for fish and to avoid impacts to aquatic species. We have appreciated Reclamation's support of the current MOU and MFMS and we would like to work with you to provide scientifically-based adjustments that provide better protection for our river through a changing climate.

Second, Reclamation maintains the ability through the Municipal and Industrial Water Shortage Policy (WSP) to treat allocations differently between CVP divisions due to regional CVP water supply availability, system capacity, or other operational constraints. This water year has shown us that regional hydrologic variability can occur between different Sacramento-San Joaquin Delta tributaries. In fact, while conditions across the state this year were dry, the American River watershed was still within a relatively normal range for snowpack and projected inflow, yet CVP allocations for American River Division contractors were reduced to a level that appeared to be inconsistent with conditions present within the watershed. Moving forward, we would like to request that Reclamation considers an American River-specific CVP allocation that accounts for localized conditions. At a minimum, reductions in allocations should be suspended for the months in which Reclamation is conducting increased releases from Folsom Reservoir to maintain flood control capacity.

Third, as we stated in our scoping comment letter in 2018 for the prior reinitiation of Section 7 consultation, we would like to emphasize that any operational or structural changes made in one part of the system could redirect impacts to another part of the system, or supply sources outside of the CVP and SWP but which are relied upon by some American River Division contractors, such as the Yuba, Bear, and Cosumnes Rivers. Therefore, we would like to reiterate our grave concerns regarding potential impacts to the future water supply reliability and ecosystem sustainability of the American River as a result of operational revisions elsewhere in the CVP and SWP.

Thank you for your consideration of our comments. If you have questions or need clarifications, please contact Michelle Banonis at mbanonis@rwah2o.org.

Sincerely,



Michelle Banonis
Manager of Strategic Affairs, Regional Water Authority

On behalf of:
City of Folsom
City of Roseville
City of Sacramento
El Dorado Irrigation District
Placer County Water Agency
Sacramento County Water Agency
Sacramento Municipal Utility District
Sacramento Suburban Water District

San Luis & Delta-Mendota Water Authority

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March 30, 2022

VIA EMAIL

Cindy Meyer
Bureau of Reclamation
Bay-Delta Office
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Sacramento, CA 95814-2536

Cindy Meyer: sha-MPR-BDO@usbr.gov

Re: Re: Notice of Intent to Prepare an Environmental Impact Statement for Analyzing Potential Modifications to the Long-Term Operation of the Central Valley Project and State Water Project – Scoping Comments

Dear Ms. Meyer:

The San Luis & Delta-Mendota Water Authority ("Water Authority") appreciates the opportunity to comment in response to the U.S. Bureau of Reclamation's ("Reclamation") Notice of Intent to Prepare an Environmental Impact Statement ("EIS") and Hold Public Scoping Meetings on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project, published in the Federal Register on February 28, 2022 ("NOI"), 87 Fed. Reg. 11093 (Feb. 28, 2022).

The Water Authority is a public agency with its principal office located in Los Banos, California. It was formed in 1992 as a joint powers authority, and has twenty-seven member agencies. Twenty-five of the Water Authority's member agencies contract with the United States for the delivery of water from the federal Central Valley Project ("CVP"). Most of the Water Authority's member agencies depend upon the CVP as the principal source of water they provide to users within their service areas. That water supply serves approximately 1.2 million acres of agricultural lands within areas of San Joaquin, Stanislaus, Merced, Fresno, Kings, San Benito, and Santa Clara Counties, a portion of the water supply for nearly 2 million people, including in urban areas within Santa Clara County referred to as the "Silicon Valley," and millions of waterfowl that depend upon nearly 200,000 acres of managed wetlands and other critical habitat within the largest contiguous wetland in the western United States. The operations of the CVP are therefore of vital interest and importance to the Water Authority, its member agencies, and the people, farms, businesses, communities, and wildlife refuges they serve.

The existing plan of operations for the CVP is included in the Record of Decision: Reinitiation of Consultation on the Coordinated Long-Term Modified Operations of the CVP and State Water Project ("SWP"), signed February 18, 2020 ("2020 ROD") and the Biological Opinion on Long-term Operation of the CVP and SWP issued by the National Marine Fisheries Service on October 21, 2019, and the Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the CVP and SWP issued by the U.S. Fish and Wildlife Service on October 21, 2019 (together "2019 BiOps"), which are based on the best available scientific data available as of the documents' issuance. The existing plan of operations ensures that CVP operations will not jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat. The existing plan of operations provides a comprehensive, yet flexible, operations plan that enables Reclamation to effectively serve the CVP's various purposes, including protecting federally listed species, even when faced with prolonged drought conditions.

The Water Authority offers the following comments in response to the NOI, with the aim of encouraging Reclamation to achieve the same end with any new plan of operations.

1. Proposed Action

Under CEQ regulations, a notice of intent must briefly describe "the proposed action and possible alternatives." 40 C.F.R. § 1508.22. Under the heading "Proposed Action and Preliminary Alternatives To Be Considered," the NOI describes alternatives that may be considered in the EIS, but does not specifically describe a proposed action. 87 Fed. Reg. at 11094.

For purposes of this letter, the Water Authority assumes that the proposed action is the continued long-term operations of the CVP, consistent with Congressional authorizations, in coordination with the SWP, and consistent with applicable agreements and law. The remaining comments are made with this assumption in mind.

2. Purpose and Need

An EIS must contain a statement of "purpose and need" that briefly specifies "the underlying purpose and need to which the [lead] agency is responding in proposing the alternatives including the proposed action." 40 C.F.R. § 1502.13. The statement of purpose and need "is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives are reasonable." Reclamation's NEPA Handbook (Feb. 2012) at 8-5. The statement is important because it will guide selection of alternatives, and "[a]ll reasonable alternatives examined in detail must meet the defined purpose and need." *Id*.

The Department of Interior's NEPA regulations provide that in "some instances it may be appropriate for the bureau to describe its 'purpose' and its 'need' as distinct aspects. The 'need' for the action may be described as the underlying problem or opportunity to which the agency is responding with the action. The 'purpose' may refer to the goal or objective that the bureau is

trying to achieve, and should be stated to the extent possible, in terms of desired outcomes." 43 C.F.R § 46.420(a)(1). In this case, the need for the action and the purpose of the action are distinct—and, the EIS should reflect that difference.

Under the heading "Purpose and Need for the Proposed Action," the NOI explains why Reclamation reinitiated consultation. That explanation may provide important context but it does not replace the requirement for a clear and concise statement of need. The Proposed Action—simply put, the continued long-term operations of the CVP, in coordination with the SWP—is needed to allow Reclamation and DWR to respectively serve the purposes Congress established for the CVP and the California Legislature established for the SWP.

The statement of purpose also suffers from ambiguity and would benefit from being stated succinctly. The NOI explains the "purpose of the proposed action considered in this EIS is to continue the operation of the CVP and the SWP for authorized purposes, in a manner that: [1] [m]eets requirements under Federal Reclamation law; other Federal laws and regulations; Federal permits and licenses; and State of California water rights, permits, and licenses pursuant to section 8 of the Reclamation Act; [2] [s]atisfies Reclamation contractual obligations and agreements; and [3] implements authorized CVP fish and wildlife project purposes." 87 Fed. Reg. at 11094. This statement creates uncertainty by stating a purpose in the first bullet that may encompass the purpose stated in the last bullet. Reclamation should state the purpose of the Proposed Action is to ensure Reclamation and DWR are able to operate the CVP and SWP, respectively, consistent with Federal Reclamation law; other Federal laws and regulations; contractual obligations; Federal permits and licenses; and State of California water rights, permits, and licenses pursuant to section 8 of the Reclamation Act.

3. Affected Environment

To satisfy NEPA requirements, an EIS must "succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration." 40 C.F.R. § 1502.15. This discussion should include a "general description of the physical environment of the project area and a map defining the project area, the associated ecosystem(s), and the affected environment." Reclamation's NEPA Handbook at 8-13. This general description "should include not only the physical setting for the project, but it should describe those features—geographic, cultural, recreation, or unique or significant wildlife or vegetation—that distinguish the affected area from other areas." *Id*.

a. Clarification Regarding Areas Included

The NOI does not use the term "affected environment." Under the heading "Project Area (Area of Analysis)," the NOI states that "[t]he project area includes CVP service areas and CVP dams, power plants, diversions, canals, gates, and related Federal facilities located on Clear Creek; the Trinity, Sacramento, American, Stanislaus, and San Joaquin rivers; and in the Sacramento-San Joaquin Delta (Delta)." 87 Fed. Reg at 11094 (emphasis added). In addition, the NOI states, "The

project area includes SWP service areas downstream of the Feather River and SWP facilities in the Sacramento-San Joaquin Delta, Cache Slough Complex, and Suisun Marsh." *Id*.

First, to ensure a complete analysis of potential impacts of the Proposed Action, the project area must include the CVP service areas and facilities located within the watersheds for the rivers listed above, and not be limited to CVP facilities located "on" the listed rivers and in the Delta (in addition to CVP service areas).

Second, further clarity should be provided regarding whether and how the project area includes the Trinity River Division and Friant Division. Based on the first bullet point in this section of the NOI, regarding the Trinity River, and the fifth bullet point, regarding the San Joaquin River, it appears they will be included. 87 Fed. Reg. at 11094. However, given the unique complexities associated with both Trinity River and Friant Division operations[1] the Water Authority recommends clearly identifying which components of divisional operations will be analyzed.

b. Importance of Analyzing Effects on Communities South of the Delta

The project area appropriately "includes CVP service areas." 87 Fed. Reg. at 11094. The CVP service areas are a critical component of the human environment potentially affected by changes in CVP operations. When CVP water deliveries to communities and lands south of the Delta are restricted or absent, the people who live and work in this region suffer. This suffering manifests itself in many ways, including:

1. Reduced employee hours, lost wages and jobs, loss of tax revenue to fund municipal services such as fire and police protection, and the resulting reduction in staffing at the local government level, thereby contributing to family disruption and dislocation;

2. Adverse impacts to local schools from the relocation of farming-dependent families, lost school revenues, and additional social costs for schools, food shortages and increased demand for public services such as food banks, and an increased incidence of crime;

3. Loss of crops, including the destruction of permanent crops, which increases the amount of fallowed land that diminishes air quality due to dust and particulate matter and decreases

[1] For example, Reclamation operates the Trinity River Division consistent with a Long-Term Plan for Protecting Late Summer Adult Salmon in the Lower Klamath River, but the species analyzed in this plan are not listed as threatened or endangered under the ESA. Will these operations be included in the proposed action? Another question: does Reclamation intend to include the Trinity River Restoration Program Winter Flow Variability, or operations for coho salmon? And with respect to the Friant Division, does Reclamation intend to include the San Joaquin River Restoration Program?

public health through increased instances of Valley fever and other respiratory ailments; and

4. Increased groundwater pumping, resulting in decreased irrigation water quality and impacts to crops from increased soil salinity, groundwater overdraft resulting in land subsidence and associated impacts to infrastructure, increased energy usage and associated environmental impacts - including greenhouse gas emissions - related to increased pumping, and depletion of groundwater reserves.

The above-listed impacts should be part of the analysis of the proposed action and project alternatives. That analysis will be important when assessing the ability of each alternative to serve the purpose and need for the proposed action.

4. Scope of Alternatives

In the alternatives analysis, federal agencies must "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. §§ 4332(2)(E), 4332(2)(C)(iii). Reasonable alternatives are those that are "technically and economically practical or feasible and meet the purpose and need of the proposed action." 43 C.F.R. § 46.420.

As the existing plan of operations already provides a comprehensive and flexible method for Reclamation to effectively serve the CVP's various purposes, alternatives should be limited to those that reflect and incorporate scientific and other data that has become available since the 2020 ROD and that meet the purpose and need for the proposed action.

Modifications to operations included in the various alternatives should also be tailored to address the effects of CVP operations. New scientific data and information can assist in this process. For example, the study published by Dr. Rebecca Buchanan et al. in 2021[2] regarding outmigration survival of steelhead is relevant scientific information that Reclamation should consider when developing measures to protect out-migrating San Joaquin River steelhead.

Finally, Reclamation should not volunteer to take actions that DWR may be required to take pursuant to CESA, if Reclamation's action could diminish CVP water supply available to CVP contractors, change the timing of deliveries to the detriment of the needs of CVP contractors, or place financial commitments on the CVP contractors. The Water Authority acknowledges that there is some difficulty in coordinating CVP and SWP operations where the SWP must comply with conditions imposed under CESA. However, Reclamation is not subject to CESA. To reduce conflict between CVP and SWP operations, Reclamation and DWR should explore (1) changes to

[2] Buchanan, R.A., E. Buttermore, and J. Israel. 2021. Outmigration survival of a threatened steelhead population through a tidal estuary. Can. J. Fish. Aquat. Sci. 78: 1869-1886.

CVP operations only if the changes do not adversely affect the timing or quantity of water available for CVP purposes or the cost to CVP contractors, and (2) changes that align SWP operations to CVP operations, as part of each alternative.

5. Conclusion

The Water Authority appreciates this opportunity to submit these comments and looks forward to working with Reclamation and others in this planning process.

Sincerely,

J. Scott Petersen, P.E.
Director of Water Policy
San Luis & Delta-Mendota Water Authority

March 29, 2022

Cindy Meyer via email
Bureau of Reclamation
Bay-Delta Office, Sacramento, CA
sha-MPR-BDO@usbr.gov

Re: Scoping Comments on Bureau of Reclamation Notice of Intent to Prepare an EIS on the 2021 ESA Reinitiation of Section 7 Consultation on the Long-Term Operation of the CVP and SWP (Reference: 87 Federal Register 11093-11095, February 28, 2022)

Dear Cindy Meyer and U.S. Bureau of Reclamation:

By this letter, our public interest organizations comment, pursuant to NEPA, the ESA, and Reclamation law, on the Bureau of Reclamation's (Reclamation) Notice of Intent (NOI) to Prepare an EIS on the 2021 ESA Reinitiation of Section 7 Consultation on the Long-Term Operation of the CVP and SWP. Our Table of Contents is on the next page.

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INTRODUCTION

Nine public interest organizations join in this comment letter.[1] The National Environmental Policy Act (NEPA) Regulations require the Draft Environmental Impact Statement (EIS) to be prepared by Reclamation to "include a summary that identifies alternatives, information, and analyses submitted by… public commenters during the scoping process for consideration by the lead and cooperating agencies in developing the environmental impact statement." 40 C.F.R. § 1502.17(a.)[2] These comments include an alternative entitled the *Public Interest Alternative*, and also information and analyses. The *Public Interest Alternative* and the information and analyses *must be identified in Reclamation's Draft EIS summary.*

NEPA Regulation § 1502.17(a)(1) requires that *these comments be appended to the Draft EIS* or otherwise published by Reclamation.

The summary of Reclamation's Notice of Intent (NOI) states, "The Bureau of Reclamation intends to prepare an Environmental Impact Statement (EIS) for analyzing potential modifications to the Long-Term Operation of the Central Valley Project (CVP) and the State Water Project (SWP.)"

The scope of the Draft EIS to be prepared will have to be much broader and fairly balanced in contrast to the narrow water export bias set forth in the NOI. The Draft EIS proposed in the NOI would be oblivious to the water crisis already existing which will worsen in the future. The crisis results from several factors. There are climate change caused worsening droughts, reduced snowpack, and reduced freshwater runoff coupled with increased salinity intrusion into the San Francisco Bay-Delta Estuary (Delta) caused by climate change increased sea level rise. There is the continued failure of Reclamation (and other agencies) to base decisions on real water available as opposed to "paper water." There is continued reliance on the historical water record rather than the reduced water available under current conditions impacted by climate change.

[1] AquAlliance**,** California Water Impact Network, California Sportfishing Protection Alliance, Center for Biological Diversity, Environmental Water Caucus, Friends of the River, Planning and Conservation League, Restore the Delta, and Sierra Club California join in this comment letter.

[2] The NEPA Regulations are codified at 40 C.F.R. §1500 et seq.

On March 21, 2022, United Nations Secretary General Antonio Guterres told attendees of the Economist Sustainability Summit the world "is sleepwalking to climate catastrophe." (The Washington Post, p. A3, March 22, 2022.) Reclamation has been sleepwalking to climate catastrophe by continually ignoring its reliance on "paper water" instead of real water, reduced water supply, worsening water quality, and destruction of endangered and threatened fish species and their critical habitat.

The Draft EIS as outlined in the NOI would be oblivious to the continuing failure of Reclamation to quantify available water and prioritize retaining sufficient stream, river, and Delta flows to preserve endangered and threatened fish species as required by the ESA. Reclamation's plan as evidenced by the NOI appears to be to continue to drive the endangered and threatened fish species into extinction.

The Draft EIS as outlined in the NOI would be oblivious to the need for comprehensive analysis to comply with the Central Valley Project Improvement Act (CVPIA) and California's constitutional reasonable use requirement, conduct public trust balancing of the water public trust water resource, and reduce reliance on the Delta for water exports as required by the Delta Reform Act. It would be oblivious to reducing the claimed need for water exports by modern innovations such as conservation, recycling, and ceasing water exports to drainage impaired lands.

The Draft EIS as discussed in the NOI would be "so inadequate as to preclude meaningful analysis" that "a supplemental draft of the appropriate portion[s]" will be required. NEPA Regulation § 1502.9(b.)

The purpose and need outlined in the NOI is oblivious to the water crisis and the above requirements established by law. The same is true of the "alternatives" outlined in the NOI. The Draft EIS must include a reality-based alternative that would eliminate "paper water" from CVP and SWP operation and instead be based on the stream, river, and Delta flows necessary to preserve endangered and threatened fish species and also comply with the CVPIA, NEPA, and California's reasonable use requirements, Delta Reform Act and the public trust doctrine.

I. THE PURPOSE AND NEED FOR THE PROPOSED ACTION SET FORTH IN THE NOI MUST BE REVISED IN THE DRAFT EIS TO PROCEED IN THE MANNER REQUIRED BY LAW

The Purpose and Need for the Proposed Action as outlined in the NOI appears designed to continue Reclamation's pattern and practice of failing to proceed in the manner required by the ESA, NEPA, and the CVPIA. After a general reference to the requirements of the Federal Reclamation law, and other Federal laws, the NOI states its specific purposes of the proposed action to continue operation of the CVP and SWP in a manner that:

> Satisfies Reclamation contractual obligations and agreements; and
> Implements authorized CVP fish and wildlife project purposes. (87 Fed. Reg. 11094,)

Reclamation's contractual obligations were set a half century ago. Things have changed in the past half-century. There has been and will continue to be ever worsening climate change and droughts reducing freshwater runoff-- available water.

Pursuant to the ESA, priority must be given to preserving endangered and threatened fish species and their critical habitat. The CVPIA, Pub. L. No. 102-575, 106 Stat. 4706, purposes set forth in section 3402, include: "(a) to protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California; (b) to address impacts of the Central Valley Project on fish, wildlife and associated habitats;..(e) to contribute to the State of California's interim and long-term efforts to protect the San Francisco Bay-Sacramento San Joaquin Delta Estuary; (f) to achieve a reasonable balance among competing demands for use of Central Valley Project water, including the requirements of fish and wildlife, agricultural, municipal and industrial and power contractors."

Section 3406(b), 106 Stat. 4714, of the CVPIA requires operation of the CVP "*to meet all obligations under State and Federal law, including but not limited to the Federal Endangered Species Act*…" (Emphasis added.) Section 3404(c)(2), 106 Stat. 4709, of the CVPIA requires the administration of "all existing, new, and renewed contracts in conformance with the requirements and goals of this title."

The first purpose and need set forth in the Draft EIS must be to protect and preserve endangered and threatened fish species and their critical habitat as required by the ESA and the CVPIA.

The second purpose and need set forth in the Draft EIS must be to conduct water supply quantification. The first comprehensive evaluation of appropriative water rights in California shows "that water right allocations total 400 billion cubic meters, approximately five times the state's mean annual runoff. In the state's major river basins, water rights account for up to 1000% of natural surface water supplies, with the greatest degree of appropriation observed in tributaries to the Sacramento and San Joaquin Rivers and in coastal streams in Southern California."[3] All Draft EIS analysis must start with water actually available, as opposed to "paper water." And that means water available under current and future conditions reduced by climate change.

The third purpose and need set forth in the Draft EIS must be to comply with the CVPIA and California's constitutional reasonable use requirement, reduce reliance on the Delta for water exports as required by the Delta Reform Act, and conduct public trust balancing of the public trust water resource. That includes consideration of technological innovations reducing the claimed need for water exports such as conservation and recycling, and also eliminating diversions and exports for drainage impaired agricultural lands.

II. THE PUBLIC INTEREST ALTERNATIVE

The remaining sections and subsections of these comments will explain why the *Public Interest Alternative* provisions set forth here are required. The *Public Interest Alternative* provisions required to be included in or with the Draft EIS are as follows:

1) The Draft EIS must include quantification to determine how much water is actually available in contrast to the "paper water" which is estimated to be five times more than real water.

2) The Draft EIS must include accurate scientific analysis of the environmental impacts of CVP and SWP Long-Term operation and their impacts on endangered and threatened fish species and their critical habitat.

[3] Grantham and Viers, *100 years of California's water rights system: patterns, trends and uncertainty*, Environmental Research Letters 9, 084012 (19 August 2014.)

3) The Draft EIS must include accurate scientific analysis to determine what stream, river, and Delta flows are necessary under various conditions to avoid jeopardy to endangered and threatened fish species and adverse modification of their critical habitat. The required protective flows have priority over CVP and SWP contractual quantities.

4) The Draft EIS must include accurate scientific analysis to determine whether diversions and exports comply with California's Constitutional prohibition of unreasonable use and waste including but not limited to diversions and exports for agricultural lands in the southern San Joaquin Valley including drainage impaired lands. The analysis will include reducing diversions and exports as a result of technological innovations such as conservation, recycling, drip irrigation and less water intensive agricultural use reducing the need for the diversions and exports.

5) The Draft EIS must include accurate scientific analysis to perform public trust doctrine analysis and balancing of CVP and SWP diversions and exports compared to their adverse impacts on public trust resources.

6) The Draft EIS must include accurate scientific analysis of adverse environmental impacts of CVP and SWP diversions on public health, including, but not limited to, worsening algal blooms adversely impacting the environmental justice communities of the Delta

7) The Draft EIS must include accurate scientific analysis of adverse environmental impacts of any "Potential new storage, conveyance, and other water supply infrastructure" (Reference, NOI, 87 Fed.Reg. 11095.)

8) The Draft EIS must include cost-benefit analysis of any "Potential new storage, conveyance, and other water supply infrastructure" (Reference, NOI, 87 Fed.Reg. 11095.)

9) Reclamation will reduce diversions and exports to avoid jeopardy to endangered and threatened fish species and adverse modification of their critical habitat.

10) Reclamation will reduce diversions and exports to avoid adverse impacts on public health including, but not limited to, worsening algal blooms adversely impacting the environmental justice communities of the Delta.

11) Reclamation will reduce diversions and exports to eliminate unreasonable use and waste turning to modern water measures including conservation, recycling, desalination, and agricultural water conservation.

12) Reclamation will stop providing Project water to impaired farmlands on the west side of the San Joaquin Valley and the Tulare Basin.

13) Reclamation will reduce diversion and export quantities by not providing water for high water-demand permanent crops especially on the west side of the San Joaquin Valley and the Tulare Basin.

14) Reclamation will reduce diversions and exports to comply with California's Delta Reform Act.

15) Reclamation will reduce diversions and exports to reduce or eliminate adverse impacts on public trust resources.

16) Reclamation will Include in the Draft EIS these resilient resource strategies to save water. "MAF" means million acre-feet/year.

Resource Strategy	Water Savings/Supplies (MAF/year)
Ag Water Use Efficiency	5.6-6.6 MAF
Urban Water Use Efficiency	2.9-5.2 MAF
Recycled Municipal Water	1.2-1.8 MAF
Stormwater Capture	0.4-2.0 MAF
TOTAL	10.1-14.2 MAF

These resilient water strategies are part of the *Public Interest Alternative* and *would save between 10.1 and 14.2 million acre-feet of water per year.*[4]

[4] *The SMART Alternative to Tunnel(s): A Sensible Water Management Portfolio* at p. 2, Sierra Club California (May 2019) referencing Peter Glick et al. *The Untapped Potential of California's Water Supply: Efficiency, Reuse, and*

17) All of the accurate scientific analysis and information developed for the above *Public Interest Alternative* provisions will be disclosed and included in the Draft EIS.

Again, this *Public Interest Alternative --must be identified* --in the Draft EIS summary. NEPA Regulation § 1502.17(a.) And, *these comments* must be appended to the Draft EIS, or otherwise published by Reclamation. NEPA Regulation § 1502.17(a.)

III. REQUIRED CONTENTS OF THE DRAFT EIS AND THE REASONS WHY THE PUBLIC INTEREST ALTERNATIVE MUST BE INCLUDED IN THE DRAFT EIS

The following subjects listed and discussed in this comment letter must be analyzed in the Draft EIS for it to comply with NEPA, the ESA, and the CVPIA. And, the *Public Interest Alternative* must be included in the Draft EIS. It is a reasonable, indeed required, alternative given the requirements of the ESA, NEPA, the CVPIA and California's reasonable use requirement, Delta Reform Act, and public trust doctrine. That is so given the adverse impacts of current CVP and SWP operation on endangered and threatened fish species and their critical habitat, water flows and water quality, and the public trust water resource. In contrast, the alternatives mentioned in the NOI (87 Fed. Reg. 11094-11095) are oblivious to the requirements of the above laws and the ever-worsening conditions resulting from climate change and emphasis on diversions for water exports.

A. Quantification is Necessary to Determine how much Water is actually Available for Use

As explained above, water right allocations in California are "approximately five times mean annual runoff." Moreover, "the snowpack and run-off models" used by Reclamation and the Department of Water resources "are no longer correct." Reclamation is relying on outmoded computer models and supporting destructive 'old-school' industrial agriculture…"[5]

Stormwater. Pacific Institute and Natural Resources Defense Council, June 2014. Available at https://pacinst.org/wp-content/uploads/2014/06/ca-water-capstone.pdf.

[5] California Water Impact Network, Release, *The Worst Drought in 1200 Years, California at the Rubicon* (March 16, 2022.)

The South of Delta agricultural contractors have received only 50% or less of the contract quantities in 16 of the past 30 years and 7 of the past 10 years, and have received 20% or less of the contract quantities in 6 out of the last 10 years.[6] So, the existing contract quantities represent unrealistic "paper water." Despite that, the CVP contracts provide in Article 12(a), "In its operation of the Project, the Contracting Officer will use all reasonable means to guard against a Condition of Shortage in the quantity of Project Water to be made available to the Contractor pursuant to this Contract."

The "paper water" situation is similar with respect to SWP contracts. The SWP contracts Table A amounts are 4,184,000 acre-feet of water per year whereas the actual water supply from the SWP is more in the vicinity of 2 to 2.5 million acre-feet-feet of water per year. *Planning and Conservation League v. Department of Water Resources*, 83 Cal.App.4th 892, 908 fn.5, 912-913 (2000). Despite that, the SWP contracts provide in Article 16(b), "The State shall make all reasonable efforts to perfect and protect water rights necessary for the System and for the satisfaction of water supply commitments under this contract."

The California Supreme Court has held under the California Environmental Quality Act (CEQA), "The future water supplies identified and analyzed must bear likelihood of actually proving available; speculative sources and unrealistic allocations ('paper water') are insufficient bases for decision-making under CEQA. *Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal.4th 412, 432 (2007.) What is true under CEQA is also true under the law upon which CEQA was patterned—NEPA.

The State of California released the *Water Resilience Portfolio* prepared by the California Natural Resources Agency, CalEPA, and the California Department of Food & Agriculture, on July 28, 2020. The *Portfolio* was required by Governor Newsom's Executive Order N-10-19. The *Portfolio* discusses climate change impacts including (at p. 14),

> Rising winter temperatures *will reduce mountain snowpack in the Sierra Nevada and Cascade ranges by 65% on average by the end of the century*, increasing flashy winter run off and flood risks while reducing spring and summer stream flow. (Emphasis added.)

[6] Bureau of Reclamation, Central Valley Operations, Summary of Water Supply Allocations (Historical), *available at* https://www.usbr.gov/mp/cvo/vungvari/water_allocations_historical.pdf .

Reclamation's continued thoughtless starting point of "paper water" as opposed to real water creates unwarranted priority to divert and export quantities of export water regardless of the requirements to protect endangered and threatened fish species and their habitats, and to allocate the precious public trust water resource in the public interest pursuant to law.

How can Reclamation "possibly know how much water to transfer safely from a collapsing estuary and its upstream water sources if we don't know how much water is really available, and as compared with over-promised water right claims?"[7]

Quantification must be disclosed and analyzed in the Draft EIS and is a key part of the *Public Interest Alternative*. Moreover, quantification must include disclosure of worsening water supply resulting from climate change.

B. Accurate Scientific Analysis and High-Quality Information Must be the Basis for Draft EIS Assessment of the Environmental Impacts of CVP and SWP Long-term Term Operation and Impacts on Endangered and Threatened Fish Species and their Critical Habitat

The EIS to be prepared must contain high-quality information and accurate scientific analysis. *Lands Council v. Powell*, 395 F.3d 1019, 1031 (9th Cir. 2005.) If relevant data is not available or not complete the EIS must disclose that fact. (*Id*.) "One of the purposes of an EIS is to ensure full disclosure of the environmental consequences of a project." *Columbia Basin Land Protection v. Schlesinger*, 643 F.2d 585, 594 (9th Cir. 1981.)

It is time for Reclamation to, in the Draft EIS, finally analyze and disclose the environmental consequences now and in the future of CVP and SWP water delivery amounts --set back in the 1960s-- and the operation of the Project dams, reservoirs, and diversions. A lot has changed in the half century since the 1960s including more severe droughts, reduced freshwater runoff, and increased sea level rise and salinity intrusion resulting from climate change; declines in endangered and threatened fish species and their critical habitats; declines in water quality; and a public health crisis including harmful algal blooms in the Delta.

[7] *Climate Equity and Seismic Resilience for the San Francisco Bay-Delta Estuary*, at p. 5, Restore the Delta (2019.)

Thorough, accurate, and honest scientific analysis of the environmental consequences of CVP and SWP Long-Term operation must be set forth in the Draft EIS. And, this requirement is a key part of the *Public Interest Alternative*.

C. Diversions for CVP and SWP Exports must be Reduced to Increase Delta Outflows and Comply with the ESA

Again, CVPIA section 3406(b) requires operation of the CVP "to meet all obligations under State and Federal law, including but not limited to the Federal Endangered Species Act…" Section 7(a)(2) of the ESA requires federal agencies to "insure that any action authorized, funded, or carried out by such agency…is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species…determined…to be critical …" 16 U.S.C. §1536(a)(2). The ESA's "no-Jeopardy mandate applies to every *discretionary* agency action-- regardless of the expense or burden its application might impose." *National Association of Home Builders v. Defenders of Wildlife*, 551 U.S. 644, 671 (2007) (emphasis in original.) Endangered and threatened fish species and their critical habitat still exist and are jeopardized and their critical habitats are adversely modified by the operation of the CVP and SWP.[8]

The Congressional Research Service has explained,

[8] The *Sacramento River Winter-Run Chinook Salmon* is listed as an Endangered species under the ESA. 50 C.F.R. § 17.11. Critical habitat for the species was designated to include the Sacramento River extending from the River Mile 0 near the Delta to River Mile 302. 50 C.F.R. § 226.204. The *Central Valley Spring-Run Chinook Salmon* is listed as a Threatened species under the ESA. 50 C.F.R. § 17.11. Critical habitat for the species was designated to include the Sacramento River from Lat 38.0612, Long -121.7948, near Mile 0, upstream to Elk Slough (38.4140, -121.5212), in Clarksburg, California. 50 C.F.R. § 226.211(k)(5)(i). The *Central Valley Steelhead* is listed as Threatened under the ESA. 50 C.F.R. § 17.11. Critical habitat for the species was designated to include the Sacramento River from Lat 38.0653, Long -121.8418, near Mile 0, upstream to Elk Slough in Clarksburg. 50 C.F.R. § 226.211(l)(5). The *Southern Distinct Population Segment of North American Green Sturgeon* is listed as Threatened under the ESA. 50 C.F.R. § 17.11. Critical habitat for this species is designated to include the Sacramento–San Joaquin Delta including all waterways up to the elevation of mean higher high water within the area defined in California Water Code Section 12220. 50 C.F.R. § 226.219(a)(3). The *Delta Smelt* is listed as Threatened under the ESA. 50 C.F.R. § 17.11. Critical habitat for the species was designated to include "all contiguous waters of the legal Delta." 50 C.F.R. § 17.95–e–Fishes–Part 2.

> The CVP made significant changes to California's natural hydrology to develop water supplies for irrigated agriculture, municipalities, and hydropower, among other things. Most of the CVP's major units, however, predated major federal natural resources and environmental protection laws such as ESA and the National Environmental Policy Act (NEPA; 42 U.S.C. §§4321 et seq.), among others. Thus, much of the current debate surrounding the project revolves around how to address the project's changes to California's hydrologic system that were not major considerations when it was constructed.[9]

The California State Water Resources Control Board (SWRCB) has explained to Reclamation,

> Available scientific knowledge indicates that decreasing freshwater flows in the Bay-Delta watershed and increasing exports and associated reverse flows in the interior Delta is expected to have a negative impact on the survival and abundance of native fish species, including threatened and endangered species that are the subject of the existing BiOps for the [CVP and SWP]Projects. *There is a body of scientific evidence that increased freshwater flows through the Delta and aquatic habitat restoration are needed to protect Bay-Delta ecosystem processes and native and migratory fish*…
> The scientific basis for updating flow objectives supports increasing spring, winter, and fall flows in tributaries to the Bay-Delta, *increasing Delta outflows*, and reducing cross Delta flows, in addition to numerous non-flow measures to provide reasonable protection for fish and wildlife beneficial uses. (Emphasis added.)[10]

In the words of the SWRCB, "fish and wildlife species… are already in poor condition, some of which are on the verge of functional extinction or extirpation." (*Id.*)

In September 2016, the SWRCB determined that under its new flow proposal for the San Joaquin River and its tributaries it would be necessary to "decrease the quantity of surface water available for diversion for other uses compared to the current condition (water supply effect)." (Evaluation of San Joaquin River Flow and Southern Delta Water Quality Objectives and implementation, Executive Summary at ES -21). As the Board pointed out: "The Bay-Delta is in ecological crisis. Fish species have not shown signs of

[9] Congressional Research Service, *Central Valley Project: Issues and Legislation* at p. 3, R45342 (Updated March 8, 2022.)

[10] Comment Letter on Draft EIS for the Reinitiation of Consultation on the Coordinated Long-Term Operation of the CVP and SWP at p. 3, from Diane Riddle, Assistant Deputy Director, Division of Water Rights, SWRCB to David Mooney, Area Manager, Bay Delta Office, Bureau of Reclamation (September 25, 2019.)

recovery since adoption of the 1995 Bay-Delta Plan objectives intended to protect fish and wildlife." (*Id.* at ES -1).[11]

In October 2017, the SWRCB found that: "it is widely recognized that the Bay-Delta ecosystem is in a state of crisis." (Final Scientific Basis Report in Support of New and Modified Requirements for Inflows from the Sacramento River and its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows, at 1-4). The water management infrastructure including CVP and SWP "have been accompanied by significant declines in nearly all species of native fish, as well as other native and non-native species dependent on the aquatic ecosystem. Fish species have continued to experience precipitous declines since last major update and implementation of the Bay-Delta Plan in 1995 that was intended to halt and reverse the aquatic species declines occurring at that time. In the early 2000s, scientists noted a steep and lasting decline in population abundance of several native estuarine fish species that has continued and worsened during the recent drought. Simultaneously, natural production of all runs of Central Valley salmon and steelhead remains near all-time low levels." (*Id.*). According to the SWRCB, the best available science indicates that existing "requirements are insufficient to protect fish and wildlife." (*Id.* at 1 – 5).

The *Water Resilience Portfolio* explains (at p. 12),

> Over the last 200 years, human engineering to capture and divert flows has altered the natural functions of most major rivers and water -dependent habitat in the state. Reclamation has eliminated most of the state's historical wetlands. These changes have impaired our overall resilience as a state and impacted fish and wildlife, threatening the existence of several native fish species including distinct runs of salmon and steelhead that support tribal communities, the commercial and sport-fishing industry, and marine species.
>
> Reduced stream flows, increased temperatures, lack of habitat, and proliferation of invasive species have impacted many fish species across the state. Native fish and wildlife evolved to cope with drought, but dry periods are increasingly stressful given reduced habitat and river flow in recent decades. During extended drought, many streams already diminished by diversions warm, lesson, or dry up completely. Pollution compounds the stress. Many species are declining, and the number of fish species considered highly vulnerable to extinction rose from nine in 1975 to 31 species today.

[11] Also in September 2016, The Bay Institute published its report, *San Francisco Bay: The Freshwater-Starved Estuary*. Basically, water taken from the rivers is reducing water flowing from the rivers feeding the estuary so that the estuary--the Sacramento-San Joaquin River Delta, Suisun Marsh, and the bay-- ecosystem is collapsing.

> State and federal laws enacted to protect against reduced river flows and loss of habitat have been unevenly applied and only partially successful.

The *Water Resilience Portfolio* also explains (at p. 13),

> Improved understanding is needed about the amount of water that must stay in rivers and streams to protect fish, wildlife, habitat, and water quality, and further actions are needed to support the availability of water for these needs.

The *Water Resilience Portfolio* (at p. 21) recognizes conditions will worsen for the "natural ecosystems on which fish and wildlife depend. Climate change further threatens these ecosystems as air and water temperatures increase and dry periods become more punishing."

The Congressional Research Service has explained just how bad things are getting.

> No Delta smelt were found in the annual September midwater trawl survey in 2021, marking four years in a row with no smelt found in the September survey. This has caused some scientists to assert that Delta smelt may disappear from the wild in 2021 or 2022.[12]

And,

> In addition to Delta smelt, multiple anadromous salmonid species found in the Bay-Delta ecosystem have been listed under the ESA since 1991. These species include the endangered Sacramento River winter-run Chinook salmon, the threatened Central Valley spring-run Chinook salmon, the threatened Central Valley steelhead, threatened Southern Oregon/Northern California Coast coho salmon, and the threatened Central California Coast steelhead. Certain runs of chinook salmon are also faced with population declines in the Bay-Delta; scientists estimate that 2% of winter-run juvenile chinook salmon survived the summer of 2021, largely due to drought and warming temperatures.[13]

Pertinent information in the following sections of these comments is incorporated into this ESA section by this reference. For example, CVP and SWP water should not be diverted for and exported to drainage-impaired poisoned agricultural lands on the west side of the San Joaquin Valley and the Tulare Basin even if there were no ESA.

The Draft EIS must include thorough, accurate, and honest analysis and disclosure of the effects of CVP and SWP operation on endangered and threatened fish species and their critical habitat. The *Public Interest Alternative* would require Long-Term operation of the CVP and SWP to comply with ESA Section 7.

[12] Congressional Research Service, *Central Valley Project: Issues and Legislation* at p. 17 (Updated March 8, 2022.)
[13] Congressional Research Service, *Central Valley Project: Issues and Legislation* at p. 17 (Updated March 8, 2022.)

D. Alternatives Reducing Reliance on the Delta and, Consequently, Reducing Exports are Required by NEPA and the Delta Reform Act

A central issue in a legally sufficient Draft EIS would be consideration of the trade-offs between delivery of full contract quantities, and reduction of deliveries in order to improve water quantities and quality in California's rivers and the Delta. The Sacramento-San Joaquin Delta Reform Act of 2009 (Delta Reform Act) is codified at Water Code § 85000 et seq. Water Code section 85021 establishes the policy of the State of California "to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency." Again, CVPIA section 3406(b) requires operation of the CVP "*to meet all obligations under State*" as well as Federal law. The Sacramento, San Joaquin, Trinity (diversions), American, and Stanislaus River watersheds flow into the San Francisco Bay-Delta prior to portions being diverted for export to CVP and SWP operations.

Achieving the aims of NEPA requires consideration not only of possible impacts, based on the major federal action as proposed, but also of feasible alternatives. The NEPA Regulations require, "To better integrate environmental impact statements into State, Tribal, or local planning processes, environmental impact statements shall discuss any inconsistency of a proposed action with any approved State, Tribal, or local plan or law (whether or not federally sanctioned). Where an inconsistency exists, the statement should describe the extent to which the agency would reconcile its proposed action with the plan or law." 40 C.F.R. § 1506.2(d.) An EIS will have to include discussion of "[p]possible conflicts between the proposed action and the objectives of federal, regional, state, and local (and in the case of a reservation, Indian tribe) land use plans, policies and controls for the area concerned." 40 C.F.R. § 1502.16(a)(5). Again, the declared policy of the State of California is "to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in regional supplies, conservation, and water use efficiency … ." Water Code § 85021. Another critically important policy established by California's Delta Reform Act, is the policy to, "[r]store the Delta ecosystem, including its fisheries and wildlife, as the heart of a healthy estuary and wetland ecosystem." Water Code § 85020(c).

NEPA expressly requires an EIS to include "alternatives to the proposed action." 42 U.S.C. § 4332(C)(iii). Moreover, NEPA expressly requires Federal agencies to, "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of

available resources." 42 U.S.C. § 4332(E). The alternatives section "should present the environmental impacts of the proposed action and the alternatives in comparative form," based on the information and analysis presented in the sections on the affected environment (40 C.F.R. § 1502.15) and the environmental consequences (40 C.F.R. § 1502.16)." 40 C.F.R. § 1502.14.

The Ninth Circuit Court of Appeals reversed a district court's denial of summary judgment to environmental plaintiffs where Reclamation had failed to sufficiently analyze alternatives. *Pacific Coast Federation of Fishermen's Assn's v. U.S. Dep't of the Interior*, 655 Fed.Appx. 595 (9th Cir., No. 14-15514, July 25, 2016) (not selected for publication). The challenged environmental document in *Pacific Coast*, issued by Reclamation under NEPA for eight interim CVP contracts, included Westland's Water District's interim contract for two-year interim contract renewals. "Reclamation's decision not to give full and meaningful consideration to the alternative of a reduction in maximum interim contract water quantities was an abuse of discretion and the agency did not adequately explain why it eliminated this alternative from detailed study." *Id.* at 599. Reclamation's "reasoning in large part reflects a policy decision to promote the economic security of agricultural users, rather than an explanation of why reducing maximum contract quantities was so infeasible as to preclude study of its environmental impacts." *Id*. at 600.[14]

The required NEPA alternatives analysis would facilitate meaningful consideration of the trade-offs between water deliveries and environmental harm. It would examine opportunities to reduce deliveries due to facts such as agricultural lands becoming drainage-impaired, and innovations in technology, such as conservation, water recycling, and drip irrigation.

[14] The Ninth Circuit's unpublished decision is consistent with *California v. Block*, 690 F.2d 753, 765-769 (9th Cir. 1982), where the project at issue involved allocating to wilderness, non-wilderness or future planning, remaining roadless areas in national forests throughout the United States. Like the situation here where a trade-off is involved between water exports and Delta restoration, the Forest Service program involved "a trade-off between wilderness use and development. This trade-off, however, cannot be intelligently made without examining whether it can be softened or eliminated by increasing resource extraction and use from already developed areas." 690 F.2d at 767. Here, likewise, trade-offs cannot be intelligently analyzed without examining whether the impacts of an alternative reducing exports can be softened or eliminated by increasing water conservation and recycling, and retiring drainage-impaired agricultural lands in the areas of the exporters from production. *Accord, Oregon Natural Desert Assn. v. Bureau of Land Management*, 625 F.3d 1092, 1122-1124 (9th Cir. 2010) (uncritical alternatives analysis in EIS privileging one form of use over another violated NEPA).

The Public Interest Alternative would increase Delta outflows and comply with NEPA and the Delta Reform Act.

E. Operation of the CVP and SWP Must Comply with California's Reasonable use Requirements

Article X of the California Constitution states:

> It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that *the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare*. The right to water or to the use or flow of water in or from any natural stream or watercourse 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 extend to the waste or unreasonable use or unreasonable method of use* or unreasonable method of diversion of water … . (Emphasis added.) Cal. Const. art. X, § 2.

The state Water Code reaffirms this policy in substantially the same language. Water Code § 100. The Draft EIS must provide the necessary analysis of whether those state-mandated, constitutional requirements are met by Long-Term operation of the CVP and SWP. Such analysis would include the foundational alternative of reducing deliveries as current methods of use have or will become unreasonable due to the worsening of adverse impacts of water diversions because of climate change caused reduced freshwater runoff and increased salinity intrusion and technological innovations lessening the need for exports.

The *Water Resilience Portfolio* explains (at p. 18), "The most cost-effective, environmentally beneficial way to stretch water supplies is through better water use efficiency and eliminating water waste. Many California communities have made great progress in reducing per capita water use in recent decades."

The City of Los Angeles has a plan to reduce its imported water supply by 50% by the year 2025. According to Water Replenishment District President John Allen, "Water recycling is the wave of the future." (Release, August 22, 2019.) "SB 606 and AB 1660 [signed into law May 31, 2018] emphasize efficiency and stretching existing water supplies in our cities and on farms." (SWRCB fact sheet.)

"There has been consistent pressure on urban areas to do more to conserve water." "And to their credit, they've been responding. Considerable progress in conservation and water recycling has been made in many cities."[15] "But cities use only about 20% of California's developed water, said [Jay] Lund.[16] *The remaining 80% is used by agriculture*. Therefore, Lund emphasized, the only practical way to achieve significant water savings is through the retirement of 'impaired lands'; croplands in the southern San Joaquin Valley that are heavily laced with selenium and salt. To remain productive, these lands must be flushed periodically with large volumes of water, simultaneously wasting a public trust resource and creating clouds of toxic effluent that imperil fish and wildlife." *(Id*.) (Emphasis added.)

"A shift in recent years toward permanent orchards and vineyards has hardened demand for reliable water supplies, because growers cannot forgo irrigating these crops during droughts."[17] In other words, Reclamation is facilitating the opposite of what needs to be done in terms of types of crops in areas receiving water exports.

The Draft EIS must include thorough, accurate and honest analysis and disclosure of such unreasonable use of CVP and SWP water on drainage impaired lands in the southern San Joaquin Valley and uses that have become unreasonable due to worsening environmental conditions and/or technological improvements lessening the claimed need for exports.

The *Public Interest Alternative* would eliminate the unreasonable use and method of use of CVP and SWP diversions and exports for agriculture in the southern San Joaquin Valley.

F. Public Trust Doctrine Analysis Must be part of the Draft EIS

Then there is California's public trust doctrine as explained by the California Supreme Court in the Mono Lake case, *National Audubon Society v. Superior Court*,

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[15] California Water Impact Network, Release, *The Worst Drought in 1200 Years, California at the Rubicon* (March 16, 2022.)

[16] Jay R. Lund is Co- Director of the Center for Watershed Sciences and Distinguished Professor of Civil and Environmental Engineering at the University of California, Davis.

[17] *Water Resilience Portfolio* p. 12.

> The state has an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible. Just as the history of this state shows that appropriation may be necessary for efficient use of water despite unavoidable harm to public trust values, it demonstrates that an appropriative water rights system administered without consideration of the public trust may cause unnecessary and unjustified harm to trust interests…As a matter of practical necessity the state may have to approve appropriations despite foreseeable harm to public trust uses. In so doing, however, the state must bear in mind its duty as trustee to consider the effect of the taking on the public trust … and to preserve, so far as consistent with the public interest, the uses protected by the trust." 33 Cal.3d 419, 446-47 (1983) (citations omitted).

Moreover, the California Supreme Court held in *National Audubon Society*, "In exercising its sovereign power to allocate water resources in the public interest, the state is not confined by past allocation decisions which may be incorrect in light of current knowledge or inconsistent with current needs." (*Id*.)

The United States Supreme Court recognizes that "the States retain residual power to determine the scope of the public trust over waters within their borders." *PPL Mont., LLC v. Montana*, 565 U.S. 576, 604 (2012). And "running waters cannot be owned—whether by a government or by a private party." *Sturgeon v. Frost*, 139 S. Ct. 1066, 1078 (2019.)

The Delta Reform Act (Water Code § 85023) mandates,

> The longstanding constitutional principle of reasonable use and the public trust doctrine shall be the foundation of state water management policy and are particularly important and applicable to the Delta.

The *Water Resilience Portfolio* explains (a p. 13),

> Improved understanding is needed about the amount of water that must stay in rivers and streams to protect fish, wildlife, habitat, and water quality, and further actions are needed to support the availability of water for these needs.
> Drastic loss of fish and wildlife habitat makes it important to restore and connect habitat where feasible.

Moreover,

> The projected statewide water needs of California fish, wildlife, and natural ecosystems *have not been quantified*, given the diversity of the state's river systems and evolving understanding of both the biological needs of species and future climate-driven conditions. However, it is clear that each river system

> requires adequate season-by-season water flow to protect the natural functions fish and wildlife need. Such flows also support healthy water quality and temperatures and should be complemented by adequate habitat and removal of invasive species to enable fish and wildlife to thrive. (*Water Resilience Portfolio* p.15) (Emphasis added.)

Water Resilience Portfolio proposal 9.2 is, "Conduct and utilize instream flow analyses to further develop instream flow recommendations for ecologically important streams to protect public trust values." (*Portfolio* p. 21.)

Public trust doctrine analysis is of critical importance here. A real public trust analysis of the 26 rivers of the Delta watershed needs to be done in performing the quantification work required to make informed, rational decisions about CVP and SWP Long-Term operation. Having a real public trust analysis that includes all non-market public trust resources, including clean water, healthy flowing rivers, healthy abundant fish, and recreational opportunities, is also critical information for an alternatives analysis.

As an example of CVP water contracts, the quantity set forth in the largest contract, that of Westland's Water District, was set at 1,008,000 acre-feet per year in the original contract of June 5, 1963. Water deliveries commenced by 1968, and the quantity was raised in 1986 and remains at 1,150,000 acre-feet per year. "The Central Valley Project (CVP), managed by the California-Great Basin Region, has over 270 contracts for the delivery of up to 9.5 million acre-feet of water on an annual basis. There are several different types of contracts: Settlement Contracts; Exchange Contracts; Refuge Contracts; Water Service Contracts; and, Repayment Contracts." (Bureau of Reclamation website.)

The original SWP water supply contracts had been entered into by the end of 1967. The SWP Table A Amounts have been and remain at 4,185,000 acre-feet per year.

There has never been public trust resource analysis or balancing of either the CVP or SWP water delivery quantities. The contract delivery quantities remain virtually the same as set back in the 1960s. California's water availability has changed over the past half-century. Climate change continues to lead to reduced freshwater flows and increased salinity intrusion. Agricultural lands especially in the southern San Joaquin Valley continue to become drainage-impaired poisoned lands. Fish species and their critical habitat continue to decline. Harmful algal blooms continue to worsen. Some good news is that technological innovations lessen the claimed need for CVP and SWP water exports.

The Draft EIS must include thorough, accurate, and honest public trust analysis. That requirement is part of the *Public Interest Alternative*.

G. Reclamation Cannot Rely on Existing Environmental Requirements

Reclamation cannot rely on existing requirements. For example, the Water Quality Control Plan for the San Francisco Bay-Delta (WQCP) (Water Rights Decision 1641, D-1641) was adopted in 1995, and amended without substantive changes in 2006. As already noted, there been numerous adverse, ever worsening environmental impacts in the quarter-century since D-1641 was adopted resulting from CVP and SWP diversions and exports including but not limited to reduced water availability due to climate change.

D-1641 it is badly outdated and cannot be relied upon for conclusions as to adverse environmental impacts in the Draft EIS.

H. CVP and SWP Diversions have Adverse Impacts on Human Health including Environmental Justice Communities that Must be Analyzed and Disclosed in the Draft EIS

One example of the adverse impact of CVP and SWP diversions on public health is the worsening buildup of environmental toxins in the Delta including toxic blue-green cyanobacteria (Microcystis.) On September 1, 2019, Bay City News Service reported,

> A buildup of blue-green algae (cyanobacteria), commonly called an algae bloom, along the Sacramento-San Joaquin River Delta has prompted a safety warning from Contra Costa Environmental Health Services.
>
> The department is advising people out for holiday weekend recreation on the Delta that contact with blooms can make people and pets very sick. Cyanobacteria create a green, blue-green, white or brown coloring on the surface of slow-moving waterways.
>
> Advisory notices have been posted at the kayak launch and around the fishing dock at Big Break Regional Shoreline in Oakley after cyanobacteria was detected in the water.
>
> It warns users to stay out of the water, and do not touch algae scum in the water or on the shore, do not use the water for drinking, cleaning or cooking; do not let pets or livestock enter or drink the water; and do not eat fish or shellfish from the water.

> A caution advisory has also been posted near the boat ramp around the mouth of Mormon Slough by the California State Water Resources Control Board.

Stockton urban waterways are stagnant and thick with algal scum and toxins. Algae blooms are regularly found from Stockton to Discovery Bay with smaller ones becoming visible in sloughs between the cities. Maintaining diversion levels combined with climate change will reduce freshwater flows and increase the buildup of these dangerous algal blooms.

According to the EPA, "Harmful algal blooms are a major environmental problem in all 50 states. Red tides, blue-green algae, and cyanobacteria are examples of *harmful algal blooms that can have severe impacts on human health*, aquatic ecosystems, and the economy. *Algal blooms can be toxic*. Keep people and pets away from water that is green, scummy or smells bad." (U.S. EPA website https://www.epa.gov/nutrientpollution/harmful-algal-blooms February 7, 2022)(Emphasis added.)

According to the EPA,

Harmful algal blooms can:

- *Produce extremely dangerous toxins that can sicken or kill people* and animals
- Create dead zones in the water
- Raise treatment costs for drinking water
- Hurt industries that depend on clean water (*Id.*)(Emphasis added.)

According to a Restore the Delta Report,

> Percentage-wise, the Delta region has the largest environmental justice community in California, with parts of Stockton hitting the 95th percentile for economic distress, and small Delta towns comprised of 52% of residents for whom English is not their first language. The economic distress of many Stockton environmental justice communities exceeds that of all other environmental justice communities of California.[18]

The Draft EIS must include accurate scientific analysis and high-quality information on the adverse impacts of CVP and SWP diversions on public health, including, but not limited to worsening algal blooms adversely impacting the environmental justice communities of the Delta.

[18] *Climate Equity and Seismic Resilience for the San Francisco Bay-Delta Estuary*, at p. 6, Restore the Delta (2019.)

CONCLUSION

The Draft EIS must include accurate scientific analysis and high-quality information including quantification and the adverse environmental impacts of CVP and SWP diversions, exports, and project operations. There must be sufficient scientific analysis and high-quality information to allow Reclamation to avoid jeopardizing the continued existence of endangered or threatened species or result in the destruction or adverse modification of their critical habitat. The *Public Interest Alternative* must be included as an alternative in the EIS.

Contacts for this comment letter are Conner Everts, Facilitator, Environmental Water Caucus (310) 804-6615 or connere@gmail.com or Robert Wright, Counsel, Sierra Club California (916) 557-1104 or bwright@gmail.com . We would do our best to answer any questions you may have.

Sincerely,

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March 22, 2022

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RE: Delta Conveyance Project - Scoping Comment Letter
Subj: SolAgra Water Solution viable alternative to DCP

The SolAgra Water Solution ("SWS") is a viable alternative to the Delta Conveyance Project that must be considered under NEPA and CEQA, as well as the Clean Water Act.

SolAgra has previously submitted details of the SolAgra Water Solution as a viable alternative to the BDCP and the CWF. Both of those projects have been abandoned, but in both cases the analysis of alternatives that would meet water supply needs without damaging the Delta environment and communities was not included in the environmental review as required by law. Since we received no response to our previously provided comments, there is also no publicly available basis for this omission. Our July 29, 2014, comment letter provided a detailed discussion of the various legal requirements to consider alternatives, including the SolAgra Water Solution, but all alternative solutions that proposed intakes in the west Delta were summarily dismissed without further analysis or consideration. All of the comments made in our July 29, 2014, comment letter continue to apply in the context of the new Delta Conveyance Project EIR, and it was a legal error for the EIR/S to omit consideration of the SolAgra Water Solution.

An additional basis for consideration of the SolAgra Water Solution in addition to the requirements of CEQA and NEPA is for purposes of determining the Least Environmentally Damaging Practicable Alternative ("LEDPA"). (See 33 U.S.C. § 1344(b)(1).) USACE regulations provide, "[N]o discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem." (40 C.F.R. § 230.10(a).) USACE regulations specifically require the applicant to identify possible practicable alternatives especially including those alternatives that do not involve the discharge of fill material. (40 C.F.R. § 230.10(a)(i).)

The project purpose and need can be met by the SolAgra Water Solution. Diversions from the Delta under the SolAgra Water Solution can occur in a manner that "minimizes or avoids adverse effects to listed species, and allows for the protection, restoration and enhancement of aquatic, riparian and associated terrestrial natural communities and ecosystems." Due to the location of the SolAgra intakes on Sherman Island in the western Delta, diversions can also "restore and protect the ability of the SWP and CVP to deliver up to full contract amounts when hydrologic conditions result in the availability of sufficient water." Even in the case of insufficient available water quantities, as California has experienced during the most recent seven-year continuing drought, the SolAgra Water Solution would provide up to 1 million Acre-Feet/ year ("MAF") of newly created water via a large brackish water desalination plant on Sherman Island. Using state-of-the-art desalination technologies, this water supply would be **drought proof** and would **be built to be above projected sea level rise**.

The SolAgra Water Solution is a practicable alternative that would have a less adverse effect on the aquatic ecosystem than the currently preferred DCP. In particular, the SWS requires only one 19-mile-long tunnel instead of a 38-mile-long tunnel, PLUS the SolAgra tunnel would have a 28-foot diameter, appreciably smaller than the 40-foot diameter tunnel proposed in the DCP. Moreover, since the SolAgra tunnel would run primarily south of the Delta from Sherman Island to the SWP facilities at Bethany Reservoir, NO WATERS/WETLAND fill would be necessary. DCP proposes more than 15 million cubic yards of tunnel excavation/ fill material to be deposited in pristine areas of the Delta, the SolAgra Water Solution would deposit less than 1.5 million cubic yards of fill material, and this material would all be deposited on Sherman Island in areas that are currently upland grazing areas (not wetlands). This quantity of fill material can be deposited on 310 acres at a depth of only 3 feet. This quantity of fill material would be beneficial to the environment by offsetting the land subsidence that has occurred on Sherman Island over many years. When graded and re-compacted, this fill area can be re-seeded and returned to grazing with no impact to the environment. The SWS produces less than 10% the amount of fill material as the DCP. The SWS tunnel path uses existing easements and rights of way so that no private lands must be purchased or "taken" by eminent domain. Due to the location of the SolAgra tunnel, approximately 50% of the material removed from the tunnel will be rock that is sourced from beneath the foothills of Mt. Diablo. This rock will be used to produce the fish screening permeable levee sections that allow fresh and brackish water to be brought onto Sherman for processing and desalination.

The total tunnel length proposed in the DCP is more than 38 miles. This is twice the length of the SolAgra tunnel shown in the SolAgra Exhibit 2. The SolAgra plan would be constructed near existing high-capacity powerlines and ultimately be powered in large part by a SolAgra Solar Power plant that can be built on existing grazing land on Sherman Island. Thus, the upcoming LEDPA determination that will occur with the USACE review provides an additional basis for full consideration of the SolAgra Water Solution.

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SolAgra Corporation has a better alternative and requests that it be heard and given serious consideration. The SWS is a reasonable and superior alternative to the BDCP/CWF/DCP. It is an imperative, required by law, which must be fairly evaluated.

A description of the SWS was previously submitted as a superior alternative to the many potential project configurations considered in the BDCP/ CWF EIR/EIS. As explained in our prior letters, the SWS is designed to better accomplish the tasks for which the BDCP/ CWF and the now the rebranded "Delta Conveyance Project", was designed.

State and federal endangered species acts, and environmental review statutes require that every project must fully consider alternatives to minimize take of endangered species and investigate means to avoid significant environmental impacts. The SWS accomplishes these tasks without the un-mitigatable economic, environmental and social impacts of the twin-tunnels proposed by the CWF.

The current DCP tunnel plan to divert up to 6,000 cfs of freshwater from the upper Sacramento River at Clarksburg would produce unacceptable water quality in the lower Sacramento River. This plan also increases salinity downstream of the Clarksburg intakes, thus violating basic clean water requirements by moving X2 upstream. This was confirmed in the letter by the U.S. Environmental Protection Agency during the DEIR/S process for the California Water Fix. The BDCP's severe impacts to fish in the northern Delta are one of the main reasons that the former BDCP project could not be permitted as a 50-year conservation plan, and it was ultimately abandoned and replaced by the California Water Fix. CWF was abandoned and replaced by the DCP.

Water from SolAgra's proposed Sherman Island water processing and desalination plant is NOT vulnerable to drought or projected sea level rise. It will provide greater reliability to ensure as much (or more) than the quantity proposed by the DCP.

The SolAgra Water Solution can be built in half the time and at far less cost both financially and environmentally.

The water quality in the Sacramento River at Sherman Island is superior to the San Joaquin River water that is currently drawn into the Clifton Court Forebay by the Banks Pumping Plant. The desalinated water produced by the Sherman Island Desalination Facility will be far superior to the Sacramento River water. Therefore, the blended output from the Sherman Island Desalination Facility will far exceed the water quality that can be diverted by the CWF from the Sacramento River at Clarksburg.

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1. **The SWS provides a superior alternative to DCP. The comparisons are undeniable.** Since the beginning of construction of the State Water Project ("SWP") in the 1950s, California has relied upon high risk "serial engineering". This means undertaking quick-fix solutions - reasoning that "the end justifies the means" OR "let's get the water flowing south and we'll worry about the consequences later." "Later" has now arrived and the consequences are dire. Each new engineering solution attempts to remediate the disastrous conditions created by the previous "solution." This is also the case with the currently proposed DCP. The SWS will better restore Sacramento River flow pathways and volumes, resulting in significant benefits to native fish species and other wildlife in the Delta. It will also benefit fishermen, local residents and farmers. SWS would pump the SWP's entitlement through intakes on State owned land at Sherman Island.
2. SWS would increase the SWP's capabilities to export water to the rest of California. In fact, the SWS is the only alternative with the capability of generating up to **1 million acre-feet of "new" drinking water each year** by filtering and desalinating brackish water arriving on the tides from Suisun Bay. **The SWS provides this capability irrespective of drought conditions.**
3. SWS would employ a Public-Private partnership similar to the business structure that was used by our Joint Venture Partners, IDE Technologies to design and build the largest seawater desalination facility in the Western Hemisphere in Carlsbad, California – just north of San Diego. Desalinating brackish water from eastern Suisun Bay, with only 2-4% the salinity of seawater, can be up to 25 times more efficient and far less power intensive than desalinating 100% seawater as is being successfully done in Carlsbad, CA today.

The SWS would produce the same volume of water (2.4 million AF/year) at Sherman Island than is currently pumped from the south Delta at the Banks Pumping Plant ("Banks") during a "normal-water year". However, our use of desalination produces higher quality water than is pumped at Banks. **This very high-quality water provides significant benefits to the State Water Contractors that purchase water from the State Water Project.** The water production and pumping to the SWP is accomplished using renewable energy. Banks currently uses 11 – 26,000 horsepower pumps to pump water from the Clifton Court Forebay up to Bethany Reservoir, where it enters the SWP. This is a vertical rise of 244 feet. The SWS would pump directly from Sherman Island to Bethany Reservoir using pressure created by the desalination plant to pump water to Bethany Reservoir, thereby bypassing Banks. This allows the current power used at Banks to become available for other uses while Banks is on standby, and it makes Banks available for a better use.

In high-water years when water is plentiful and local hydroelectric power is available to power Banks, that pumping plant would be used, as needed, to create surge pumping

capacity that has never before existed. This accomplishes the “Big Gulp” aspired to in the BDCP/CWF and DCP, and it does so with renewable energy.

- The SWS would provide this increased surge capacity. This capacity combined with the prudent design and construction of additional high capacity “plumbing” could move large quantities of water during the infrequent flood stages when reservoirs throughout the state are releasing water to avoid overtopping. This “Big Gulp” flow can be stored in Tulare Lake for later redistribution to the San Joaquin Valley water districts. **The needs of the Central Valley Project (“CVP”) can be addressed by this side of the equation.** This provides a complete, environmentally superior alternative to the DCP.
- The SWS would be powered by 100% renewable energy from SolAgra’s locally proposed Sherman Island Solar Power Plant. When required, that solar power could be augmented by wind power from the existing nearby Rio Vista wind farms. All power would be delivered via existing power corridors. No additional easements or rights of way would be required.

The SWS would create a dual-plant, interconnected water processing system on State-owned land on Sherman Island. Plant #1 filters and processes incoming fresh water from the Sacramento and San Joaquin rivers via multiple fish-screened intakes around Sherman Island. Plant #2 intakes brackish water through fish-screened intakes on Sherman Lake and Mayberry Slough and desalinates this brackish water very efficiently due to the low salinity (when compared to sea water). After processing, desalinated water from Plant 2 is blended with fresh, filtered water from Plant 1. The combining of fresh water with the treated and desalinated brackish water will replace the 2.4 million Acre-Feet/year of lower quality fresh water that is currently conveyed through the SWP in a “normal water year.” The water produced at Sherman Island will be of higher quality than the water that is pumped from the Clifton Court Forebay in the south Delta via Banks because it will be **processed** at Sherman Island, not just screened and pumped. This means the State Water Contractors that receive the water from the SWP will receive higher quality water than they currently receive from Banks, OR they would receive from the DCP tunnel.

- The SWS can augment the low flow of fresh river water in years of reduced river flow due to drought or other issues. The output volume of the desalination plant can be increased to provide additional desalinated water to make up for reduced quantities of available fresh water caused by drought or sea level rise.
- The separation of processing functions into two discrete, but interconnected plants, allows both plants to operate at peak efficiency, while still accomplishing the end result of producing 2.4 million Acre-Feet/year of fresh water for the SWP **irrespective of drought** conditions.

The new fresh water that is produced at Sherman Island will be pumped through a single, 28-foot ID pressure tunnel that is only 19 miles long (see Exhibit 2). This is far superior to the 40-foot tunnel proposed by the DCP.

Since the incoming water to Sherman Island will be fish-screened by long low-velocity intakes via permeable levees as it enters the island, and it will be pressurized via the filtration and desalination processes, it can completely bypass the Clifton Court Forebay and the Banks Pumping Plant. It can be pumped directly to Bethany Reservoir, where it will begin its gravity flow into the SWP's California Aqueduct.

The principal objectives and benefits of intake relocation to Sherman Island as proposed in the SWS:

- By placing the Banks Pumping Plant on standby, the 2.4 Million Acre-feet/year ("MAF") being drawn into the Banks' intakes is instead permitted to once again flow completely through the Sacramento and San Joaquin Rivers. This restores natural flows through the Delta as occurred before the State Water Project began operations in 1960. After flowing completely through the Delta, 1.4 MAF is brought onto Sherman Island and added to 1.0 MAF of new desalinated brackish water that is in taken from Sherman Lake on the south end of Sherman Island. The additional 1.0 MAF of river-flow fresh water that is not brought onto Sherman Island continues its flow into the San Francisco Bay/Delta Estuary ("SFBDE"). This additional flow supports the retention of X2 at its historic range OR moves it further west. This improves water quality in the SFBDE and facilitates the recovery of natural breeding and feeding grounds for aquatic species of concern. This meets the recommendations for increased minimum Delta outflow that the EPA; State of the Estuary Report; State Water Resources Control Board and many other analyses have clearly shown are necessary to restore the Bay-Delta and its fisheries:
- Improves both in-Delta and export water quality, rather than improving export water quality at the expense of in-Delta water quality; and
- Avoids significant impacts to the Sacramento Region, including North Delta communities, farmers, water supplies and flood control facilities.

We believe the SolAgra Water Solution is a viable alternative which could accomplish this greater task in less time and at far less cost than the DCP.

This new capability can be created by SolAgra using renewable energy, with no need to build additional fossil fuel power plants, nuclear plants, or to import "brown" power from other states. The SolAgra approach is thus fully consistent with groundbreaking statewide efforts to reduce greenhouse gas emissions.

The power easements, water conveyance rights-of-way currently exist. No additional purchases of easements or rights-of-way are required. The State of California owns 8,776 acres on Sherman Island that are more than needed for the

facilities that are proposed by the SolAgra Water Solution. No additional land must be condemned or acquired. No Delta property owners must be displaced or have their lives and/or farming operations temporarily or permanently ruined.

The SolAgra Water Solution better restores Bay-Delta ecosystems than the alternatives to be studied in the DCP-EIR/S while equaling or exceeding the water quantities projected by the DCP with less cost, in less time and without environmental impact. This reduces or eliminates expensive environmental mitigation requirements. Under the SolAgra plan, Sherman Island can become the center of the "California Water Solution."

The SolAgra Water Solution alternative would preserve natural river flows and maintain water quality in the Delta while simultaneously improving reliability of export water supply. It would also minimize or completely avoid many of the significant environmental impacts that are identified in the DCP - EIR/S. The SWS is the drought-proof solution that has been desperately needed in California for more than 50 years. This Plan **IS** the necessary alternative to the "serial engineering" that has been plaguing California since the creation of the CVP and the SWP. The SWS is a practicable and superior alternative to the DCP. **It must be fully evaluated.**

It is curious and remarkable that each new iteration of the State's water conveyance plan from the Peripheral Canal to the BDCP, CWF and DCP each move toward the design proposed by SolAgra. We warned that the original alignment of the BDCP and CWF through the center of the Delta was extremely dangerous due to in situ natural gas deposits. Our comments were disputed, but the new alignment for the DCP has been moved miles to the east (almost to Interstate 5) to avoid the natural gas problems that we warned about.

The SolAgra Water Solution has always advocated bypassing the Clifton Court Forebay, not expanding it and pumping water directly to Bethany Reservoir. Our comments were disputed and ignored, but the new "preferred alignment" for the DCP is to pump water directly to Bethany Reservoir. The significant difference between the SWS and the DCP – the SWS uses the output pressure from the desalination plant on Sherman Island to pump the water up to Bethany Reservoir. No new pumping station must be constructed. No new forebay at Clifton Court must be built (taking adjacent farmer's land). Banks pumping plant can be placed on standby and used only during "Big Gulp" times that may or may not come in the future.

The path of the SolAgra Water Solution runs entirely through public lands to the south of the Delta – therefore, we require no "taking" of private property. This will expedite the project especially when compared to the multiple emanant domain actions that will be required to "take" private lands to build the DCP.

We welcome the opportunity to discuss the SolAgra Water Solution in greater detail. We have all invested significant resources to find the best solution to California's longstanding water issues. California is experiencing the longest drought in its history. The minimal rainfall in the 2019-2021 winters may be the beginning of longer drought or the continuation of the previous drought.

With climate change exacerbating the long-term weather, it is essential that we find the most sustainable and best solutions to resolve California's water issues that have precipitated the California Water Wars for more than a century. The only solution is to produce NEW WATER that cannot be produced by "mother nature". The SolAgra Water Solution is the only solution that proposes to produce new water – regardless of drought.

Please let us know when we may schedule an appointment to discuss the benefits of the SolAgra proposal so that you may obtain the information needed to adequately review this superior alternative to the DCP.

Sincerely,

Barry Sgarrella
Chief Executive Officer
SolAgra Corporation

SOLAGRA
SOLAR + AGRICULTURE + WATER SOLUTIONS

SHERMAN ISLAND to BETHANY RESERVOIR

Water Tunnel Conveyance

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DEPARTMENT OF RESOURCE MANAGEMENT

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March 30, 2022

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Ms. Cindy Meyer
Bureau of Reclamation
Bay-Delta Office, 801 I Street, Suite 140
Sacramento, CA 95814-2536

RE: Comments on the Notice of Intent (NOI) to Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project

Dear Ms. Cindy Meyer:

We appreciate the opportunity to provide the following comments to help guide the preparation of an Environmental Impact Statement (EIS) on the Long-Term Operation of the Central Valley Project and State Water Project. Solano County (County) has been engaged with other local agencies, federal and state resource agencies, groundwater sustainable agencies, and agricultural landowners in developing habitat conservation and groundwater sustainability plans, restoration projects (e.g., wetland management), and flood management strategies (e.g., floodplain management) throughout the County and in the Sacramento-San Joaquin Delta (Delta) and Suisun Marsh. Over 62% of the land in Solano County is farmed, with irrigated agriculture comprising over half of these lands supplied with groundwater and surface water. Therefore, it is of vital importance to the County and its residents that the EIS addresses the following topics that will ultimately impact the region's agricultural, municipal, environmental, and social-economic sectors.

Purpose and Need for the Proposed Action

The NOI noted that "Reclamation requested to reinitiate consultation on the Long-Term Operation of the CVP and SWP under section 7 of the Endangered Species Act (ESA) due to anticipated modifications to the previous Proposed Action that may cause effects to ESA-listed species or designated critical habitat not analyzed in the current 2019 Biological Opinions", however, details on what may be missing in the analysis of the current 2019 Biological Opinion and the anticipated modifications are not identified or well defined. As such, due to the complexity of the proposed activities, such detail must be described in the NOI so that the public may provide meaningful responses to any specific targeted issues.

Land Use and Consistency with General Plan

The Solano County General Plan, adopted in 2008, reflects an overall commitment to provide protections for the environment while supporting its diverse land uses and human needs with emphasis on protecting agricultural uses in the Delta region. The long-term operation of the CVP

and SWP (Project) regarding the export of surface water out of the Delta region may cause significant environmental effects that directly impact the County's ability to sustain the objectives established in the General Plan. This EIS needs to assess project impacts for consistency with local landuse policies including County General Plans, in particular; agricultural policies; resource policies, including biological resources, Marsh and Delta areas, scenic resources, cultural resources, recreational resources, water resources, and quality; public and environmental health and safety policies including; flood control, disaster preparedness, and climate change; economic development policies, transportation and circulation policies; and public facilities and services policies; including water facilities and service, drainage, fire protection and emergency services, law enforcement, and utilities.

Surface Water Supply, Water Quality, Aquatic Resources, and Agricultural Sustainability
Alterations to natural freshwater flows in the Delta during Project operations would drastically impact threatened and endangered species that rely on water flows of adequate quality and quantity from the north of the Delta. The EIS must fully analyze the potential impacts to aquatic resources and potential increases of invasive species that pose additional pressures on threatened and endangered species.

The Suisun Marsh (Marsh) which is comprised of diked seasonal wetlands, is the largest brackish water marsh in the Western United States. The Marsh is managed primarily as habitat for fish and wildlife. The Marsh salinity levels are mandated by the Bay-Delta Water Quality Control Plan, which is currently being updated, and maintained by Delta outflow, tidal flows, and the operations of the Suisun Marsh Salinity Control Gates. The Project operations could result in reduced freshwater inflow to the Suisun Marsh, which may alter the quality and quantity of freshwater flows resulting in increased salinity, compromising existing water quality standards, wetland and habitat management, and Marsh management infrastructure.

Solano County is currently the lead agency for the Cache Slough Complex Habitat Conservation Plan (HCP) which is being developed in partnership with the State Department of Water Resources in coordination with habitat restoration in the Yolo Bypass/Cache Slough Region. The goal of the HCP is to provide endangered species take for existing agricultural and municipal water diversions in the Cache Slough region. Furthermore, Solano County is active and committed to sustainable agriculture, including wildlife-friendly farming, agricultural land repurposing projects with multi-benefit, and ag-forward carbon sequestration without fallowing valuable agricultural land. The sustainability of the agricultural way of life is core value to the residents of Solano County. As such, the success of the above activities and strategies is underpinned by the availability and reliability of the Delta surface water supply and other associated components afforded by the Project's long-term operation.

Integrated Resource Management
As mentioned above, the Yolo Bypass and Cache Slough Region (Region) is the focus of several interagency planning efforts through a partnership program by multiple federal, state, and local governmental agencies including Solano County and the US Bureau of Reclamation aimed at improving flood conveyance, fisheries and wildlife habitat, water supply and water

quality, agricultural land preservation, and economic development. It is anticipated that the operation of the Project will have significant impacts on the implementation of these integrated resource management projects. It is also important to consider the global effects in the Region rather than any specific area of concern due to their interconnectedness and subsequent cultural and socio-economic impacts. The alignment of such a partnership program with the operation of the Project is paramount to assure that impacts may be minimized or avoided.

Future Uncertainties

The uncertainties of the future are a great concern in any EIS analysis. The rapidly changing Delta landscape resulting from the advancing climate change outlook with sea level rise, frequent flooding and longer droughts, competing demands, and land use changes with accelerated ecological restoration activities are all factors to be considered. Other uncertainties which will have direct impact on the operation of the Project as some are noted in the NOi include the pending Bay-Delta Water Quality Control Plan update and its associated potential Voluntary Agreement implementation and proposed Delta Conveyance Project. The assessments of these uncertainties must be quantified with a range of potential scenarios and alternatives.

We appreciate again the opportunity to provide comments on the NOi for preparing an EIS for the CVP and SWP and we look forward to reviewing the draft EIS in the near future. Please do not hesitate to contact my office if you have any questions or require additional information.

Terry Schmidtbauer, Director
Department of Resource Management

Cc: Bill Emlen, County Administrator
Bernadette Curry, County Counsel

SACRAMENTO RIVER
SETTLEMENT CONTRACTORS
P.O. Box 150 Willows, CA 95988

March 30, 2022

Via Electronic Mail and First-Class Mail

Ms. Cindy Meyer
United States Bureau of Reclamation
Bay-Delta Office
801 I Street, Suite 140
Sacramento, CA 95814-2536
sha-MPR-BDO@usbr.gov

Subject: Bureau of Reclamation's Notice of Intent to Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project [87 Fed. Reg. 11093 (Feb. 18, 2022)]

Dear Ms. Meyer:

The Sacramento River Settlement Contractors (Settlement Contractors) submit this letter in response to the Bureau of Reclamation's (Reclamation) above-referenced Notice of Intent (NOI). The NOI states that Reclamation intends to prepare a programmatic Environmental Impact Statement (EIS) for analyzing potential modifications to the long-term operations of the federal Central Valley Project (CVP) and State Water Project (SWP). The NOI states that one of the purposes of the proposed action is to continue operation of the CVP and the SWP in a manner that "[s]atisfies Reclamation contractual obligations and agreements." (87 Fed. Reg. at 1094.) Reclamation requests suggestions and information on the alternatives and topics to be addressed in the EIS, and any other important issues related to the proposed action.

At the outset, the Settlement Contractors fully support Reclamation evaluating alternatives for the long-term operation of the CVP and the SWP in a manner consistent with applicable law and contractual requirements. Of course, Reclamation's performance of its obligations under the Sacramento River Settlement (SRS) Contracts is a fundamental operational requirement underpinning the alternatives that Reclamation should consider. The Settlement Contractors understand that any and all alternatives evaluated will ensure that Reclamation meets its contractual requirements under the SRS Contracts.

The EIS will also have to address the numerous competing and complementing actions related to continued long-term operations and the associated reinitiation of consultation under the federal Endangered Species Act (ESA). These actions include

but are not limited to: (1) the Coordinated Operations Agreement; (2) CVP Cost Allocation; (3) voluntary agreements related to the Bay-Delta Water Quality Control Plan Update; (4) new storage, conveyance and other water supply infrastructure; (5) WIIN Act Compliance; and (6) implementation of the CVPIA Anadromous Fish Program.

The NOI states that the potential alternatives to be considered include "potential new storage." (87 Fed. Reg. at 11095.) In this regard, the Settlement Contractors encourage and request Reclamation to evaluate the potential integration of the proposed Sites Reservoir Project with continued long-term CVP operations, to assist with the maximization of water deliveries for both water supply and public benefit purposes.

The NOI also states that "[r]easonable alternatives may support consultation for actions by Sacramento River Settlement Contractors." (87 Fed. Reg. at 11094.) The Settlement Contractors welcome the opportunity to discuss and collaborate on any such potential actions. However, under applicable law, separate consultations are not needed regarding releases from Shasta and Keswick Reservoirs under long-term operations to meet Reclamation's non-discretionary contractual obligations to the Settlement Contractors.

The Settlement Contractors also request and encourage Reclamation to continue to develop and implement a comprehensive shared and integrated science planning effort related to long-term operations. This should include a robust, transparent, and collaborative science work plan, which is absolutely critical to inform multi-benefit water management decisions and improve the recovery of salmonid species in the Sacramento River Basin. This work plan should address the ongoing uncertainty surrounding estimates of egg-to-fry survival and temperature-dependent mortality of winter-run Chinook salmon in the Upper Sacramento River. The Settlement Contractors have developed implementation plans for both improved monitoring efforts and temperature studies in order to improve upon the existing literature and studies on this topic. The EIS and analyzed alternatives must include these types of actions to advance the science that influences and shapes Shasta operations.

In this regard, Reclamation, the National Marine Fisheries Service (NMFS), the Settlement Contractors, and other parties formed and signed the charter for the Sacramento River Science Partnership. The Settlement Contractors appreciate this ongoing effort and encourage further commitment of resources to enhance comprehensive, integrated, scientific approaches to providing for better informed decision-making on long-term operations.[1]

Finally, the Settlement Contractors request and encourage Reclamation to evaluate how the potential alternatives considered will ensure compliance with the Wilkins Slough

[1] In addition, the development and implementation of a collaborative science plan will have utility in numerous settings and ongoing regulatory processes, including but not limited to the Voluntary Agreement process related to the Bay-Delta Water Quality Control Plan Update, and temperature management plans for Shasta operations during dry year conditions.

5,000 cubic foot per second (cfs) navigation flow standard, which is not discretionary. In this regard, Congress initially authorized the construction of certain facilities for the CVP under the Rivers and Harbors Act of 1935 (the 1935 Act) (49 Stat. 1028, 1038). The 1935 Act mandated in relevant part that "the following works of improvement of rivers . . . are hereby adopted and authorized . . . in accordance with the plans recommended in the respective reports hereinafter designated and subject to the conditions set forth in such documents . . . Sacramento River, California; Rivers and Harbors Committee Document Numbered 35, Seventy-third Congress . . . ." (50 Stat. 1028, 1038.) As such, the 1935 Act incorporates by reference, and expressly requires the implementation of, the recommendations of the Rivers and Harbors Committee Document Number 35. This document is a 1934 report from the Corps' Chief Engineer recommending to Congress that Kennett Dam (predecessor to Shasta Dam) "shall be operated so as to provide a minimum flow of 5,000 cubic feet per second between Chico Landing and Sacramento." (See Central Valley Project Documents, part I, 544, 548 [Committee Doc. 35, 73rd Cong.].)

Congress re-authorized the CVP under the Rivers and Harbors Act of 1937 (the 1937 Act) (50 Stat. 844, 850). This re-authorization mandated in relevant part that "the $12,000,000 recommended for expenditure for a part of the Central Valley Project, California, in accordance with the plans set forth in Rivers and Harbors Committee Document Numbered 35, Seventy-third Congress, and adopted and authorized by the provisions of section 1 of the Act of August 30, 1935 (49 Stat. 1028, at 1038) . . . shall, when appropriated, be available for expenditure in accordance with the said plans of the Secretary of Interior instead of the Secretary of War." (50 Stat. 844, 850.) As such, the 1937 Act also incorporates by reference, and expressly requires the implementation of, the recommended minimum flow of 5,000 cfs between Chico Landing and Sacramento. There has been no subsequent action by Congress that has "discontinued" or otherwise changed this minimum navigation flow requirement.

The 1937 Act also mandates that CVP "dams and reservoirs *shall* be used, *first*, for river regulation, improvement of navigation, and flood control; second, for irrigation and domestic uses; and third, for power." (50 Stat. 844, 850, emphasis added; see also *United States v. State Water Resources Control Bd.* (1986) 182 Cal.App.3d 82, 135.) In 1992, Congress explicitly amended this hierarchy of use by enacting sections 3406(a) and (b) of the Central Valley Project Improvement Act (Pub.L. No. 102-575 (1992)), which make protection of non-ESA listed fish and wildlife coequal priorities with irrigation. Even with this amendment, however, Reclamation's first priority remains river regulation, navigation, and flood control. In fact, the Settlement Contractors rely on the priority of the Wilkins Slough minimum navigation flow requirement for operation of facilities specifically designed and operated to avoid harm to listed species. For example, on the Sacramento River, all major diversions have positive

barrier flat-plate fish screens installed that provide protection to listed fishery species. These screens have been designed with an approach velocity of 0.33 feet/second, as required by NMFS and the California Department of Fish and Wildlife. During design, the screens, velocities and diversion rates were based upon the Wilkins Slough flow requirement of 5,000 cfs, given that this flow standard is non-discretionary and controlling under federal law. As such, if Reclamation reduces flows below the Wilkins Slough flow requirement, then some screens may not meet the velocity criteria as designed, and diversion pumps can experience dangerous cavitation and other operational issues. Accordingly, any and all alternatives must address compliance with the Wilkins Slough flow standard.

The Settlement Contractors appreciate Reclamation's consideration of these comments. If you have any questions, please contact the undersigned at (530) 735-6274.

Sincerely,

Roger Cornwell

Roger Cornwell, President
Sacramento River Settlement Contractors

cc (via e-mail): Ernest Conant (econant@usbr.gov)
David Mooney (dmmooney@usbr.gov)
Josh Israel (jaisrael@usbr.gov)
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:cr

March 30, 2022

Delivered by email: sha-MPR-BDO@usbr.gov

Ms. Cindy Meyer
Bureau of Reclamation, Bay-Delta Office
801 I Street, Suite 140
Sacramento, CA 95814-2536

Re: Scoping for the Environmental Impact Statement for the Long-Term Operation of the Central Valley Project (CVP) and the State Water Project (SWP)

Dear Ms. Meyer:

The State Water Contractors and its member agencies[1] (SWC) actively participated in the 2019 biological opinion consultation, as well as in all prior consultations on the long-term operation plans (LTO) for the State Water Project (SWP) and the Central Valley Project (CVP). As such we appreciate this new opportunity to provide input on the development of the proposed action and the scope of the analysis in the Environmental Impact Statement (EIS). The SWC believe that the LTO proposed action should:

1.) Be narrowly tailored to only include operations of the CVP and SWP and not include other projects such as the new Delta Conveyance Project, Sites Reservoir, the enlargement of San Luis Reservoir, or the enlargement of Los Vaqueros Reservoir;
2.) Be consistent with the proposed Voluntary Agreements for the Bay-Delta Water Quality Control Plan update;
3.) Be narrowly tailored to include minimal changes to the 2019 LTO project description; and,
4.) Be based on the best available science and be limited to what is required to meet legal requirements.

The SWC believe that these four recommendations will enable the consultation to remain on schedule and provide the needed coverage for the SWP and CVP operations going forward. It is also important that the federal LTO proposed action is consistent with the project description for the SWP's California Endangered Species Act Incidental Take Permit (CESA ITP) and that it be

[1] The SWC members are: Alameda County Flood Control & Water Conservation District, Zone 7; Alameda County Water District; Antelope Valley East Kern Water Agency; Central Coast Water Authority; City of Yuba City; Coachella Valley Water District; County of Kings; Crestline-Lake Arrowhead Water Agency; Desert Water Agency; Dudley Ridge Water District; Empire-West Side Irrigation District; Kern County Water Agency; Littlerock Creek Irrigation District; Metropolitan Water District of Southern California; Mojave Water Agency; Napa County Flood Control & Water Conservation District; Oak Flat Water District; Palmdale Water District; San Bernardino Valley Municipal Water District; San Gabriel Valley Municipal Water District; San Gorgonio Pass Water Agency; San Luis Obispo County Flood Control & Water Conservation District; Santa Clara Valley Water District; Santa Clarita Valley Water Agency; Solano County Water Agency; Tulare Lake Basin Water Storage District; and, Ventura County Watershed Protection District.

developed through a true reconciliation where the two project descriptions are developed in a collaborative manner with consistent operations, driven by the best available science.

I. The Proposed Action should be limited to just the SWP-CVP operations plan.

The proposed action should not include large construction projects like the new Delta Conveyance Project, Sites Reservoir, enlarging San Luis Reservoir or enlarging Los Vaqueros Reservoir for several reasons. First, these large construction projects will not be operating concurrently with the new LTO permits since these projects have decades long permitting and construction windows. Second, many of these projects will not be owned and operated by either the CVP or SWP and will not convey "project water." As such, including these projects in the LTO consultation may result in the SWP and CVP mitigating for the effects of projects owned by third parties. Third, to include multiple large construction projects in a single consultation would also result in an extremely complicated Endangered Species Act (ESA) consultation that would undoubtedly extend the consultation timeline many years into the future. It will be challenging to complete even a narrowly tailored consultation on the LTO within the timeline currently outlined by the state and federal governments, with a 2024 approval date, and it would be impossible if the scope of the consultation were extended to include such large construction projects.

In future decades, when some of the aforementioned projects are constructed and operational, future LTO consultations may have to consider the joint operation of the facilities for projects such as the new Delta Conveyance Project and the enlarging of San Luis Reservoir, but not for all of the projects. For example, Los Vaqueros Reservoir already operates to permits separate from the LTO and increasing the size of the reservoir will not change its ability to do so. Similarly, even though the CVP is planning to own storage in Sites Reservoir, every change in Sites Reservoir operation would not necessarily trigger a reinitiation of consultation on the LTO, particularly since agreements are expected to be in place that protect SWP and CVP operations.

II. The Proposed Action should be consistent with the Voluntary Agreements.

The SWC are encouraged by the progress made to reach agreement on the Voluntary Agreements (VAs) for the State Water Resources Control Board's (SWRCB) Bay Delta Water Quality Control Plan Update. The CVP and SWP contribution to Delta outflow contained in the VAs should be the same outflow included in the proposed action for the state and federal LTO, with consideration of the cumulative effects of outflow from non- CVP/SWP water agencies. The biological opinions will need to cover CVP and SWP operations under the VAs, and therefore the project descriptions should be consistent.

III. The Proposed Action should only include minimal changes to the 2019 LTO.

The federal government reinitiated consultation for the purposes of reviewing whether the biological opinions conflict with national objectives, and to voluntarily reconcile operating criteria between the CVP and SWP. The federal government did not find that it committed errors in approving the 2019 biological opinions. This means there is no reason to completely revise the 2019 LTO. However, it is important that the federal LTO proposed action and the SWP's CESA ITP are fully consistent with respect to the operational protections and non-flow measures to minimize and mitigate the take of the dually listed species in the Delta. We encourage Reclamation and DWR to work together to ensure that permits governing the operations of the CVP and SWP are developed to be consistent with each other.

IV. The Proposed Action should be based on the best available science and be limited to just what is required to meet legal requirements.

The proposed action should be based on the best available scientific information to minimize take, and any expected take should be minimized to support a non-jeopardy conclusion using both operational and non-operational actions. In addition, the proposed action need not include every operation included in the 2019 biological opinions and 2020 CESA ITP just because they were included in the prior permits. Reclamation and DWR should be striving to meet legal requirements without unnecessary redundancy in the operational requirements for the species protections, and therefore many layers of operational protections to address the same species of concern at the same facilities are likely unnecessary. Simplicity in operations can also help facilitate nimbleness in response to adaptive management and climate change effects.

The SWC look forward to working with the federal and state governments to develop a project description for the LTO, and to move forward with the permits applying the best available science to achieve a no jeopardy opinion. If you have any questions, please do not hesitate to contact Chandra Chilmakuri at 916-562-2583, or any of the SWC members who have elected to participate through the WIIN Act process.

Sincerely,

Jennifer Pierre

HERUM \ CRABTREE \ SUNTAG
ATTORNEYS

Jeanne M. Zolezzi
jzolezzi@herumcrabtree.com

VIA ELECTRONIC MAIL *sha-MPR-BDO@usbr.gov*

March 8, 2022

Ms. Cindy Meyer
Bureau of Reclamation
Bay-Delta Office
801 I Street, Suite 140
Sacramento, CA 95814-2536;

Re: Notice of Intent To Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project (Notice)

Dear Ms. Meyer,

Stockton East Water District (District) has reviewed the Notice and provides the following comments. We assume that all alternatives will be based upon the existing index, the stepped release schedules and the 1988 agreement. In addition:

1. A reasonable alternative should consider providing a minimum of 10,000 acre feet to East Side Contractors in critical years under the San Joaquin 60-20-20 index.

2. A reasonable alternative should consider providing water to the East Side Contractors from storage on a stepped basis in critical year types.

3. The New Melones Project is a part of the CVP owned and operated by the United States, through the Bureau. Nevertheless, the New Melones Project is unique. It differs from every other unit in the CVP because both its Congressional Authorization and the permits issued for its operation contain a required priority for local water use. Beneficiaries of the project are limited to in-basin water users and local adjacent areas. Reclamation cannot currently fulfill the in-basin demands of the Stanislaus River. Therefore, no alternative should consider releases from New Melones to meet Bay-Delta demands that can physically be met through use of water from other reservoirs.

Very truly yours,

HERUM CRABTREE SUNTAG

JEANNE M. ZOLEZZI
Attorney-at-Law

The Nature Conservancy
Protecting nature. Preserving life.™

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March 25, 2022

Ernest Conant, California-Great Basin Regional Director
U.S. Bureau of Reclamation, California-Great Basin Regional Office
2800 Cottage Way
Sacramento, CA 95825

Dear Mr. Conant,

The Nature Conservancy (TNC) appreciates The Bureau of Reclamation's (Reclamation) invitation for public to provide input on the Reinitiation of Consultation on the Long-Term Operation of the Central Valley Project (CVP) and the State Water Project (SWP).

The Nature Conservancy is a science-based organization that works throughout the world to deliver conservation solutions that benefit both people and nature. As our mission is to conserve lands and waters upon which all life depends, TNC has applied deep technical expertise, tools, and resources in conservation science expressly to conserve biodiversity.

Prior to modeling proposed actions and operations, TNC strongly encourages Reclamation to clearly define the biological objectives that will be used to inform the development of modeling alternatives. Too often, planning begins with identifying and describing a suite of actions without defining the problems that the actions are meant to solve and the outcomes that they are meant to achieve. We recommend that Reclamation first develop quantitative biological and environmental objectives against which the desired operations can be evaluated. Furthermore, as climate change alters the hydrology of freshwater systems and prolongs drought cycles, it will become more difficult to achieve management goals for freshwater ecosystems. Given these added challenges, we encourage Reclamation to consider how a changing climate will impact water management, define the biological objectives needed for ecosystems to thrive, and evaluate actions against those biological objectives. This will allow Reclamation to determine a set of actions capable of supporting resilient ecosystems under climate change and other human stressors.

There are five native fish species in the San Francisco Bay Estuary and its watersheds that are listed under the federal Endangered Species Act: delta smelt (*Hypomesus transpacificus*), Sacramento River winter-run Chinook Salmon (*Oncorhynchus tshawytscha*), Central Valley spring-run Chinook Salmon (*Oncorhynchus tshawythscha*), Central Valley Steelhead (*O. mykiss*), and the southern distinct population segment of Green Sturgeon (*Acipenser medirostris*). These species are in grave peril of extirpation. Their ecological viability has deteriorated in recent years, particularly during the severe drought conditions which have prevailed from 2012 to 2016 and from 2020 to present. The conservation status of these populations, along with those of longfin smelt and fall- and late fall-run Chinook, is strongly influenced by operations of the dams, diversions, and other infrastructure of the federal CVP and California's SWP. As such, we advocate that Reclamation integrate the biological objectives and the environmental variables needed for these species to recover in the development of CalSim modeling alternatives. One such variable is water temperature. Temperatures ranging from 42.6 to 53.6 degrees Fahrenheit result in no temperature-dependent egg mortality for winter-run Chinook Salmon in the Sacramento River from Shasta to Clear Creek. As such, maintaining this temperature range is essential to consider in modeling efforts to avoid effects of temperature-dependent egg mortality and mitigate impacts of other local disturbances.

There have been two recent efforts that propose processes to define biological objectives and environmental targets to meet those biological objectives for salmonid species in the Central Valley. The first is the Scientific Evaluation Process (SEP)[i] developed in 2019 by a group of scientists from state and federal agencies and environmental organizations, including TNC. The SEP defines a vision of conservation success for fish species in the Central Valley. Second is the Reorienting to Recovery Project[ii] launched by state and federal resource agencies, environmental interests, and public water agencies to develop an inclusive, landscape-scale process to define biological objectives that represent recovery for Central Valley salmonids. TNC encourages Reclamation to use both the SEP framework and the Reorienting to Recovery process to define the biological and environmental objectives needed for recovery of fish species in the Central Valley.

Additionally, the Central Valley is a critical stopover in the Northern Hemisphere for migratory birds along the Pacific Flyway. To meet the energetic and habitat needs of existing and target populations of waterfowl, shorebirds, and other wetland-dependent species, like the listed giant garter snake, TNC recommends that operations of CVP and SWP meet the annual water deliveries to 19 federal refuges, state wildlife areas, and private wetlands within the Grasslands Ecological Area. These deliveries—both Level 2 and Incremental Level 4—are required by the Central Valley Project Improvement Act (CVPIA). Modeling should provide coverage for Incremental Level 4 water supplies, including water that has yet to be acquired for this purpose. These water deliveries were required by CVPIA as a mitigation measure to protect the last remaining five percent of Central Valley wetlands, which, with adequate water, will continue to serve as anchors for migratory bird habitat in the Valley. The role of these wetlands that depend on water delivered through CVP and SWP is even more critical during severe droughts and thus should be included initially as part of modeling and final allocation decisions.

In closing, we advocate that Reclamation complete and publicly release analyses of how fish and migratory bird objectives will be met before finalizing the proposed actions and operations. It is critical to first define goals and objectives, which will provide a transparent basis for evaluating the implications and trade-offs of the proposed actions, ensure actions are implemented efficiently and within a specified timeframe, and allow for management of actions to meet desired conditions.

Thank you again for the opportunity to provide comments on Reclamation's Reinitiation of Consultation on the Long-Term Operation of the CVP and SWP.

Sincerely,

Jay Ziegler
Director, External Affairs and Policy
The Nature Conservancy

[i] "Conservation Planning Foundation for Restoring Chinook Salmon (Oncorhynchus Tshawytscha) and O. Mykiss in the Stanislaus River," (April 2019). https://www.scienceforconservation.org/assets/downloads/SEP_Report_April_2019.pdf.

[ii] "Defining Broad-Sense Recovery for Central Valley Salmonids: Reorienting to Recovery Project—Phase 1 Report," (Marc 2022). https://csamp.baydeltalive.com/docs/25923.

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March 30, 2022

VIA EMAIL

Cindy Meyer
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801 I Street, Suite 140
Sacramento, CA
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Re: Scoping Comments: Environmental Impact Statement for Modifications to the Long-Term Operation of the Central Valley Project and the State Water Project

Dear Ms. Meyer:

I. INTRODUCTION

On behalf of North Coast Rivers Alliance, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, San Francisco Crab Boat Owners Association, California Sportfishing Protection Alliance and the Winnemem Wintu Tribe, we submit the following scoping comments, pursuant to the Bureau of Reclamation's ("Reclamation's") February 28, 2022 Notice of Intent ("NOI") published in the Federal Register at 87 Fed. Reg. 11093.

II. RECLAMATION MUST FUNDAMENTALLY CHANGE OPERATIONS

Reclamation's NOI indicates that Reclamation will consider modifications to the long-term operation of the Central Valley Project ("CVP") and State Water Project ("SWP") in light of Reclamation's reinitiated consultation with U.S. Fish and Wildlife Service ("USFWS") and National Marine Fisheries Service ("NMFS") following Executive Order 13990 *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (86

Fed.Reg. 7037 (Jan. 25, 2021)).[1]

Reclamation's 2020 Record of Decision ("ROD") approved a course of action that squeezed more water from the Delta's collapsing ecosystem at the expense of public trust resources and prioritized deliveries to well-connected industrial agricultural interests. It did so despite decades of evidence that fundamental changes were necessary to prevent the loss of fish species that depend on a functioning Delta ecosystem for survival, that Reclamation itself acknowledged in its August 2016 requests for consultation with FWS and NMFS. Contrary to the facts before the agency, Reclamation's 2020 ROD furthered the likely extinction of these species by *maximizing* water deliveries - perhaps to drive species to extinction in order to remove additional regulatory barriers for those deliveries.

Indeed, Reclamation's decades-long mismanagement of the CVP, aided and abetted by repeated petitions to relax water quality standards and allow routine temperature exceedances and other water quality violations, has consistently prioritized water deliveries over survival of listed species. This has resulted in further water quality degradations and sharp population declines in both the Delta smelt and the San Francisco Bay-Delta Distinct Population Segment ["DPS"] of longfin smelt, and anadromous species, including Sacramento River winter-run, Central Valley spring-run Chinook, California Central Valley steelhead, and the southern DPS green sturgeon. This mismanagement also risks the viability of the Central Valley fall and late fall-run Chinook – species of concern (and thus potential future candidates for listing) under the Endangered Species Act ("ESA").

Winter-run Chinook survival rates in 2020 and 2021 were abysmally low, and this third year of drought is likely to push winter-run Chinook closer to extinction absent a fundamental shift in the management of the CVP and SWP. On January 3, 2022, the *Sacramento Bee* reported that "[t]he 2.6% survival for 2021 is the lowest recorded since 2005, and is even worse than the

[1] The United States District Court for the Eastern District of California remanded the 2020 ROD, and the FWS and NMFS Biological Opinions that the 2020 ROD implements, to their respective agencies. While the agencies reconsider their decisions, the Court has ordered Reclamation to implement an Interim Operations Plan, proposed by the California Natural Resources Agency, Reclamation, NMFS and FWS. March 14, 20222 Order Granting Federal Defendants' Motion for Voluntary Remand Without Vacatur in *Pacific Coast Federation of Fishermen's Associations v. Raimondo,* No. 1:20-cv-00431-DAD-EPG and *California Natural Resources Agency v. Raimondo,* No. 1:20-cv-00426-DAD-EPG.

4% figure from the depths of the last drought in 2015 . . . ."[2] Without a change in course, Reclamation will continue to find itself without sufficient cool water to attain the river temperatures necessary for survival. These adverse conditions will only worsen as global warming reduces snow pack, reservoir recharge, and increases air and water temperatures. Reclamation needs to plan for rather than ignore these worsening conditions in its operations of the CVP, and comply with all applicable California water law as it does so.

Reclamation must act to attain the species restoration goals of the Central Valley Project Improvement Act ("CVPIA"), Public Law No. 102-575, 108 Stat. 4600, Title XXXIV (1992), and the species protection goals of the ESA. Congress enacted the CVPIA in 1992 for the express purpose of ameliorating the adverse environmental impacts that result from CVP operations. CVPIA §§ 3402(a)-(b), 3406(b). Indeed, the CVPIA mandates that Reclamation "protect, restore, and enhance fish, wildlife, and associated habitats." CVPIA § 3402. Yet Reclamation has never attained the species restoration goals of the CVPIA, nor has it appropriately managed the CVPIA-mandated wildlife restoration funds. Likewise, Reclamation has continued to operate the CVP in a manner that imperils the listed species that depend on CVP waters for survival. These decades-long failures must be addressed and rectified now.

III. RECLAMATION MUST STUDY A REASONABLE RANGE OF ALTERNATIVES IN LIGHT OF CLIMATE CHANGE, INCLUDING AN ALTERNATIVE THAT REDUCES WATER DELIVERIES.

The CVP and SWP are vastly over-allocated, and growing demand for water will continue to outpace supply as ongoing drought and global warming continue and likely worsen. As it stands, "after exceptional drought severity in 2021, ~19% of which is attributable to anthropogenic climate trends, 2000–2021 was the driest 22-[year] period since at least 800." Williams, A.P., Cook, B.I. & Smerdon, J.E. Rapid intensification of the emerging southwestern North American megadrought in 2020–2021. Nat. Clim. Chang. 12, 232–234 (2022). (Abstract) https://doi.org/10.1038/s41558-022-01290-z**.** Reclamation must plan for the inevitable conditions that such ongoing drought and global warming will bring, including alternatives that reflect the need to reduce water deliveries.

A reduced delivery alternative is necessary to prevent the otherwise imminent extinction of many listed species. Under the ESA, Reclamation must comply with the mandates laid out by NMFS and FWS in their Biological Opinions to protect imperiled species as necessary to avoid

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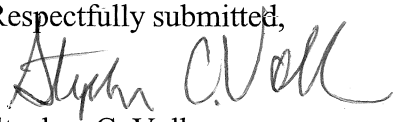
[2] Dale Kasler, Ryan Sabalow *Drought's grim death toll: California says endangered salmon perished in Sacramento River*, Sacramento Bee (Jan 3, 2022); attached hereto as **Exhibit 1.**

jeopardy. Under NEPA, Reclamation must consider a reasonable range of alternatives that both meet and exceed those protections to enable recovery of these species.

VI. CONCLUSION

Reclamation must do better than its 2020 ROD, and reverse its decades-long pattern of irresponsible resource management. At a time when the Delta's imperiled fisheries are hanging by a thread, a bold, fundamental change is necessary to prevent disaster.

Respectfully submitted,



Stephan C. Volker
Attorney for North Coast Rivers Alliance, Pacific Coast Federation of Fishermen's Associations, the Institute for Fisheries Resources, San Francisco Crab Boat Owners Association, California Sportfishing Protection Alliance and the Winnemem Wintu Tribe

Attachments:

Exhibit 1: Dale Kasler, Ryan Sabalow *Drought's grim death toll: California says endangered salmon perished in Sacramento River*, Sacramento Bee (Jan 3, 2022)

EXHIBIT
1

THE SACRAMENTO BEE

WATER & DROUGHT

Drought's grim death toll: California says endangered salmon perished in Sacramento River

BY DALE KASLER AND RYAN SABALOW

JANUARY 03, 2022 12:22 PM

Local anglers watched Wednesday as one million young Chinook salmon raised in the Feather River Fish Hatchery were released in the Sacramento River. State officials released the fish in response to last year's Oroville Damn crisis. BY RYAN SABALOW | RANDALL BENTON

Only have a minute? Listen instead

-07:30

Powered by Trinity Audio

Amid a brutal heat wave and a worsening drought, California's wildlife agency made a dire prediction in July: "Nearly all" of an endangered salmon species' juvenile population was likely to be cooked to death on the Sacramento River in 2021.

It turned out to be true. Only an estimated 2.6% of the winter-run Chinook salmon juvenile population survived the hot, dry summer, the state Department of Fish and Wildlife said.

The fate of the winter-run salmon has profound implications for California's chronically overtaxed water supplies, even as recent rain and snowpack levels suggest the drought might be easing. Environmental restrictions aimed at propping up the fish populations could deprive cities and farmers of water deliveries this year.

At the same time, fishermen and environmentalists say the salmon's pitiful survival rate, among the lowest on record, is a disaster that should have been

prevented – and raises questions about California's and the Biden Administration's commitment to the environment.

Regulators, however, said the survival figures reflect the severity of one of the worst droughts ever, as well as other factors.

The massive fish kill, unveiled in a New Year's Eve letter to the federal government, came in spite of warnings that a catastrophe was coming.

Last spring the National Marine Fisheries Service said the survival rate could be as low as 12%. Then the Department of Fish and Wildlife said it could be worse, predicting that "nearly all" of the juveniles were at risk.

Environmentalists argue the massive fish kill was caused by state and federal mismanagement of the river last spring.

Randy Pench *SACRAMENTO BEE FILE*

SALMON ARE DISAPPEARING FROM THE WILD

The winter-run salmon – which actually spawns in the heat of summer in a small stretch of the Sacramento River in Redding – has been listed as endangered since 1994 by the federal government. Because they have just a three-year spawning cycle, environmentalists and regulators fear a single disastrous season could put the salmon on the brink of extinction in the wild.

At this point, the winter-run is now almost entirely kept alive by workers at U.S. Fish and Wildlife Service, who collect eggs and sperm from a few of the adults that make their way up the base of Shasta Dam to spawn.

After they're hatched, the young fish are reared in refrigerated holding pens at the Livingston Stone National Fish Hatchery at the base of the dam.

The other two main Central Valley chinook salmon runs — the fall and spring run — haven't been faring much better, and they, too, are largely propped up by hatcheries, said Peter Moyle, a fisheries scientist at UC Davis.

"It's a difficult time to be a native fish in central California," Moyle said.

The winter-run is the most critically endangered of California's salmon populations.

Taxpayers have spent millions of dollars retrofitting Shasta Dam to release more cold water for the fish, and millions more are spent annually monitoring the temperature of the Sacramento River's waters and the plight of the fish.

The young salmon generally can't survive when temperatures in the river exceed 56 degrees, and the U.S. Bureau of Reclamation is supposed to preserve a pool of

cool water in Shasta Lake, the largest reservoir in California, for release into the river in summer and early fall.

But last spring the bureau shipped hundreds of thousands of acre-feet of Shasta's water to farmers with special water rights, said Doug Obegi, an attorney with the Natural Resources Defense Council. Obegi said the State Water Resources Control Board, which oversees water rights, should have prevented this early water release.

"This is the inevitable consequence of draining the reservoirs primarily for agribusiness," he said. "When push comes to shove the state does not live up to its legal requirements or its principles."

John McManus, president of the Golden State Salmon Association, also argued that the disaster was caused by insufficient protection for the fish.

"They knew they were going to cook the eggs," said McManus, whose group represents commercial fishermen. "It has everything to do with water management and allocation."

But state and federal officials said the fish kill wasn't simply a matter of temperatures rising on the river. Many of the fish apparently perished because of a deficiency in thiamine, or vitamin B1.

The deficiency was caused, ironically, by an abundance of anchovies in the Pacific, said Michael Milstein, a spokesman for the National Oceanic and Atmospheric Administration, a federal agency that tracks the salmon's struggles in California's waters.

Adult salmon have been feasting on anchovies, which cause a breakdown in thiamine levels. That was passed along to the juveniles. The deficiency hurts the young salmon's survival chances.

"They can't swim right," he said. "They swim in circles."

A U.S. Fish and Wildlife Service biologist handles salmon at the Coleman National Fish Hatchery, near Shasta Lake, in June 2015. Dwindling salmon populations have complicated water allocations during the drought. Randall Benton *SACRAMENTO BEE FILE*

FISH SURVIVAL AMONG THE LOWEST ON RECORD

Even in good times, the winter-run struggle to survive. Since 2005, the highest recorded survival rates were 49% in 2011 and 44% in 2017 – two extremely wet years.

The 2.6% survival for 2021 is the lowest recorded since 2005, and is even worse than the 4% figure from the depths of the last drought in 2015, according to federal figures.

This cold-water fish evolved a unique life cycle that allowed them to thrive even in the Central Valley's brutally hot summers. Adults evolved to spawn in the summer in the perpetually cold spring-fed creeks above what is now Shasta Dam.

When the dam was completed in 1945, it effectively forced the population to spawn in a short stretch of river in Redding, where temperatures regularly top out at over 105 degrees in the summer.

Only the cold water released from the bottom of California's largest reservoir keeps the eggs and young fish alive.

For much of the last decade, state and federal officials have discussed plans to capture, truck and release fish into the McCloud River and then re-capture the juveniles when they attempt to swim back down before they enter the reservoir.

The McCloud, one of Shasta Lake's tributaries, is a river fed by frigid natural springs.

Similar "trap and haul" programs have been used in the Pacific Northwest.

California water officials began building a floating device that would capture the young fish before entering the lake, but it's never been deployed in the McCloud.

The Trump administration delayed the project the Obama administration had originally proposed. At one point in 2019, the Trump administration ordered the state to remove the equipment from federal property, under the threat of jail time.

Instead, the Trump administration focused on a plan that would raise Shasta Dam. The administration argued that an extra 18½ feet of space would increase the amount of cold water in the lake, and that would help the fish trying to spawn below the dam.

Raising the dam to increase capacity by an extra 634,000 acre-feet of storage space — about two-thirds the capacity of Folsom Lake — would also increase the water supply for irrigation and urban use.

The plan to raise the dam was fiercely opposed by California officials. While the project is still technically alive, water policy experts say the Biden administration has effectively tabled it.

RELATED STORIES FROM SACRAMENTO BEE

DALE KASLER

916-321-1066

Dale Kasler covers climate change, the environment, economics and the convoluted world of California water. He also covers major enterprise stories for McClatchy's Western newspapers. He joined The Bee in 1996 from the Des Moines Register and graduated from Northwestern University.

March 30, 2022

Cindy Meyer, Project Manger
United States Bureau of Reclamation, California-Great Basin
Bay-Delta Office
801 I Street
Suite 140
Sacramento, CA 95814-2536

RE: Comments in Response to Notice of Intent to Prepare an Environmental Impact Statement on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project, 87 FR 11093

Dear Ms. Meyer,

The Water Forum appreciates the opportunity to comment on the intended scope of the proposed Environmental Impact Statement (EIS) for analyzing potential modifications to the Long-Term Operation (LTO) of the Central Valley Project (CVP) and the State Water Project (SWP).

The Water Forum is a diverse group of business and agricultural leaders, citizen groups, environmentalists, water managers, and local governments working together to balance two co-equal objectives: (1) provide a reliable and safe water supply for the region's economic health and planned development through to the year 2030; and (2) preserve the fishery, wildlife, recreational, and aesthetic values of the lower American River. In this role, the Water Forum acts as a local partner to the US Bureau of Reclamation and the US Fish and Wildlife Service to implement habitat enhancement projects and further the scientific understanding of management actions under the Central Valley Improvement Program Act (CVPIA). Together we have constructed over 30 acres of spawning habitat and over one mile of rearing habitat and conduct ongoing monitoring and science program work to document the status of the fishery and inform adaptive management and operations needs along the river. We are continuing to work together to implement an over $13 million program for continued enhancement and scientific study.

Drawing from its extensive technical knowledge of the lower American River, the Water Forum developed the 2017 Modified Flow Management Standard (MFMS), which is an operational paradigm intended to further the Water Forum's two objectives. The MFMS is the product of nearly 20 years of collaboration, research, and modeling by the Water Forum. The MFMS creates a flow standard for the lower American River that:

1. Improves conditions for anadromous salmonids; and
2. Reduces the risk of catastrophically-low storage in Folsom Reservoir.

Working cooperatively with Reclamation, the Water Forum provided the MFMS and the underlying scientific data during Reclamation's development of the 2019 Biological

Opinions for LTO. Ultimately, Reclamation included some of the Water Forum's recommended provisions for the operations of Folsom Reservoir and the lower American River, and incorporated many parts of the MFMS, in the 2019 NMFS Biological Opinion. The Water Forum continued to work with Reclamation after the release of the 2019 Biological Opinions, and, in 2021, signed a Memorandum of Understanding (MOU) with Reclamation to identify the "planning minimum" range of carryover storage for Folsom Reservoir, which Reclamation implemented as part of the 2019 Biological Opinion (consistent with the terms of the MOU).

As indicated by its name, the lower American River flow standard has been modified over time as we have collected and synthesized new data. Since 2019, we have witnessed three years of extreme drought, with record breaking events for extreme precipitation and dryness within a single water year. More significantly, we saw temperatures on the lower American River last summer that exceeded the range of the 2019 Biological Opinion and were in the lethal range for salmonids. Given these new data, the Water Forum will be re-examining the MFMS, and evaluating the need for any refinements to it, based on the science that is now available.

Consistent with the MOU and its longstanding collaboration with Reclamation, the Water Forum will provide these new data to Reclamation, along with any conclusions that the Water Forum's technical experts develop. We expect that these data constitute "best available science" that Reclamation and NMFS will rely upon as they undertake reinitiation of consultation. We look forward to engaging with Reclamation, as well as NMFS and other state and federal agencies, throughout the reconsultation process to ensure that appropriate flow and temperature standards, based on the best available scientific data, continue to be implemented for the lower American River.

Thank you for your consideration of these comments. Please do not hesitate to contact Ashlee Casey (acasey@waterforum.org) of my staff if you have any questions.

Sincerely,

Jessica Law
Executive Director

Jessica Law
Executive Director

Westlands Water District
3130 N. Fresno Street, P.O. Box 6056, Fresno, California 93703-6056, (559) 224-1523, FAX: (559) 241-6277

March 29, 2022

VIA EMAIL

Cindy Meyer
Bureau of Reclamation
Bay-Delta Office
801 I Street, Suite 140
Sacramento, CA 95814-2536

Cindy Meyer: sha-MPR-BDO@usbr.gov

Re: Notice of Intent to Prepare an Environmental Impact Statement for Analyzing Potential Modifications to the Long-Term Operation of the Central Valley Project and State Water Project – Scoping Comments

Dear Ms. Meyer,

Westlands Water District ("Westlands") appreciates the opportunity to provide comments on the scope of an environmental impact statement analyzing potential modifications to the long-term operation of the Central Valley Project ("CVP") and State Water Project ("SWP").

Westlands encompasses some 600,000 acres in western Fresno and Kings counties. The lands within the District are some of the most highly productive agricultural lands in the world, producing over 60 crops for the fresh and processed food markets. Westlands' primary source of water supply comes from the CVP; Westlands has contractual entitlements to approximately 1,195,000 acre-feet of CVP water per year. On average, agricultural activities within Westlands generate over 38,000 jobs and generates approximately $4.7 billion in economic activity. However, these jobs and economic activity are closely tied to water supply. A recent study highlighted the correlation between water supply and poverty levels in Fresno and Kings County. When water was scarce, poverty rates climbed.[1] When the District's allocation from the CVP is reduced, poverty rates in and around the District increase. Unsurprisingly, modifications to the

[1] *See* Shires, Michael A., Ph.D., The Economic Impact of the Westlands Water District on the Local and Regional Economy: 2022 Update, dated March 16, 2022 (a copy of which is attached hereto and incorporated herein by this reference).

long-term operation of the CVP and SWP would impact Westlands and those depend on Westlands. Accordingly, Westlands has a vital interest in this planning effort.

Westlands provides two principal scoping comments regarding the Bureau of Reclamation's ("Reclamation") February 28, 2022, Notice of Intent to Prepare an Environmental Impact Statement for Analyzing Potential Modifications to the Long-Term Operation of the Central Valley Project and State Water Project (87 Fed.Reg. 11093) ("Notice of Intent").

1. Need for Clarity in the Stated Purpose and Need

A. Statement of Purpose

As it prepares a draft environmental impact statement, Reclamation should refine the statement of purpose and need presented in the Notice of Intent. The statement of purpose and need "is a critical element that sets the overall direction of the process and serves as an important screening criterion for determining which alternatives are reasonable." Reclamation's NEPA Handbook (Feb. 2012) at 8-5. It is essential to the success of environmental impact statement that Reclamation presents the purpose and need for the proposed action clearly and concisely. Neither the statement of purpose nor the statement of need in the Notice of Intent is presented in that manner.

In the Notice of Intent, Reclamation explains:

> The purpose of the proposed action considered in this EIS is to continue the operation of the CVP and the SWP for authorized purposes, in a manner that:
> - Meets requirements under Federal Reclamation law; other Federal laws and regulations; Federal permits and licenses; and State of California water rights, permits, and licenses pursuant to section 8 of the Reclamation Act;
> - Satisfies Reclamation contractual obligations and agreements; and
> - Implements authorized CVP fish and wildlife project purposes.

87 Fed. Reg. at 11094. This statement creates uncertainty by stating a purpose in the first bullet that may encompass the purpose stated in the second bullet or in the last bullet. The planning process would be best served if Reclamation revised the statement of purpose to read:

> The purpose of the proposed action considered in this EIS is to continue the operation of the CVP and the SWP for authorized purposes, in a manner that meets requirements under Federal Reclamation law; other Federal laws and regulations; Federal permits and licenses; State of California water rights, permits, and licenses pursuant to section 8 of the Reclamation Act, and contracts.

B. Statement of Need

In the Notice of Intent, Reclamation explains why it reinitiated consultation under the heading: "Purpose and Need for the Proposed Action". While the explanation in that section provides context for Reclamation's proposed action, it does not replace the requirement for a clear and concise statement of need. Reclamation should supplement the context with the following statement of need:

> The need for the proposed action considered in this EIS is to continue the operation of the CVP to meet the multiple purposes of the project as authorized and directed by Congress and the SWP to meet the multiple purposes of the project established by state law.

By stating the purpose and need as proposed, Reclamation will ensure that it considers alternatives that are compliant with Congressional mandates for the CVP, generally, and specifically for all of the purposes the CVP serves, including fish and wildlife and agriculture.

2. Importance of Developing A Reasonable Range of Alternatives

The existing plan of operations for the CVP was analyzed in the Biological Opinion on Long-term Operation of the CVP and SWP issued by the National Marine Fisheries Service on October 21, 2019, and the Biological Opinion For the Reinitiation of Consultation on the Coordinated Operations of the CVP and SWP issued by the U.S. Fish and Wildlife Service on October 21, 2019 (together "2019 BiOps"). That plan of operations was adopted through the Record of Decision: Reinitiation of Consultation on the Coordinated Long-Term Modified Operations of the CVP and SWP, signed February 18, 2020 ("2020 ROD"). The 2019 BiOps and 2020 ROD were based on the best available scientific data available as of their issuance and ensure that discretionary CVP operations will not jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat, after considering the environmental baseline – all other physical, chemical, and biological changes that have occurred and are reasonably foreseeable to occur within the action area.

Since reinitiating consultation, Reclamation has consistently recognized that it is considering modifications to the long-term operation of the CVP and SWP for policy and practical reasons – pursuant to Executive Order 13990 Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis, and voluntarily reconcile CVP operating criteria with requirements of the SWP under the California Endangered Species Act. Reclamation has more recently has also identified the need to consider modification because it and other federal agencies believe drought frequency and severity are increasing.

The past two years, which were exceedingly challenging due to the erratic and very dry hydrology, have demonstrated that the comprehensive yet flexible nature of the existing operations plan has enabled Reclamation to serve, to the extent possible, the Congressionally established purposes for the CVP.

For those reasons, a foundation for each alternative included in the environmental impact statement and subjected to detailed analysis, should therefore be the existing plan of operations. Reclamation will need to consider the effect of changes to the baseline, such as the changes to the chemical constituents in the Delta resulting from Regional Sanitation's EchoWater Project (www.regionalsan.com/echowater-project), and improvements in the productivity, spatial structure, and diversity of native fish, including from the reintroduction of Spring Run salmon in the San Joaquin River and restoration of salmon and steelhead habitat in tributaries to the Sacramento River. The development of each alternative should then be guided by two primary criteria: 1) whether the alternative would be consistent with Congressional authorization and

direction, and 2) whether a change to the existing plan of operations is warranted because of scientific and other data that became available since the 2020 ROD.

Conclusion

Westlands appreciates the opportunity to submit and appreciates Reclamation's consideration of these comments.

Sincerely,

Thomas W. Birmingham
General Manager



The Economic Impact of the Westlands Water District on the Local and Regional Economy: 2022 Update

March 16, 2022

Michael A. Shires, Ph.D.

Westlands Water District

The contents of this report reflect the views of the author who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Westlands Water District or any other entity.

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EXECUTIVE SUMMARY

Agriculture is important to the economy of the California Central Valley. The agricultural products produced in the Central Valley are critical to meeting the food supply and food security needs of the United States and around the world. Those facts were in evidence and documented in our 2016 study and they remain today. This study revisits and updates the economic analysis released in 2016 titled *The Economic Impact of Westlands Water District on the Regional and Local Economy*. The purpose of this report is to both provide updated estimates of these impacts and to provide an update on the local community context in which these impacts play out, including an introduction to the complexities introduced by COVID-19 and associated impacts to the overall economy.

WESTLANDS WATER DISTRICT IS AN IMPORTANT CONTRIBUTOR TO THE LOCAL AND STATE ECONOMIES

Westlands Water District, in aggregate, is directly and indirectly responsible for some $4.7 billion dollars of economic activity and nearly 35,000 jobs across the economy as seen in Figure ES-1.

Figure ES-1—Overall Economic Impact of the Westlands Water District, By Activity Category, 2019

EMPLOYMENT	Jobs Created	Share
Crop Production	16,424.1	46.8%
Secondary Agricultural Production	17,711.3	50.4%
Westlands Operational Activity	979.2	2.8%
	35,114.5	**100.0%**

ECONOMIC IMPACT	Total Impact	Share
Crop Production	$3,172,012,510	67.3%
Secondary Agricultural Production	1,416,214,229	30.0%
Westlands Operational Activity	126,764,976	2.7%
Total Effect	**$4,714,991,715**	**100.0%**

Most of these impacts are direct impacts, created through the growing of agricultural products and the added value associated with the processing and handling of those products. The direct impacts of activities that occur in Westlands Water District represent some $3.2 billion of economic impact. Secondary impacts of these activities (through indirect and induced economic

effects) add another $1.5 billion of economic impacts. Further, these direct and secondary activities account for more than 35,000 jobs.

WESTLANDS WATER DISTRICT IS AN IMPORTANT CONTRIBUTOR TO THE REGIONAL AND NATIONAL ECONOMIES

California's growing regions are the nation's primary source of fresh fruit, nuts, and vegetables. California growers account for well over half the total U.S. production of nearly every category of fresh fruit and vegetables consumed in the United States—accounting for more than 85 percent of the production for twenty-three crops and more than 45 percent of the U.S. production of 36 crops.

Farmers in the Westlands Water District are major contributors to the national production of many key agricultural products as seen in Figure ES-2. Farms in Westlands contribute almost 23 percent of fruit and nut production in Fresno County, and almost half of the vegetable and melon produced in the county. Similarly, for Kings County, the limited acreage that falls within Westlands Water District accounts for 13.4 percent of Kings County fruit and nut crops, and more than 36.3 percent of the vegetable and melon crops. Nationally, farms in Westlands provide 3.5 percent of the national production of fresh fruit and nuts and 5.4 percent of the national production of vegetables and melons—an impressive total given the small scale of the District relative to the total arable land in the United States. This 5.4 percent compares to 3.1 percent in the 2016 study, reflecting the fact that when the District receives more of its surface allocation (75 percent in 2019 versus 0 percent in 2014), it is able to contribute more to the national output in these healthy crops.

Figure ES-2 – Westlands Water District Overall Share of Fresh Fruit, Nut, and Vegetable Crops, Estimated Crop Values by Category, 2019
(thousands of dollars)

	Westlands Water District	Fresno County	Kings County	California	United States
Fruit and Nut Crops	1,009,528	4,246,673	644,224	21,419,425	29,026,988
Vegetables and Melons	768,193	1,429,003	180,649	8,237,276	14,157,279
All other	169,171	394,555	479,059	7,723,771	
Total	**$1,946,893**	**$6,070,231**	**$1,303,932**	**$37,380,472**	

Westlands Water District – Share of Overall Output

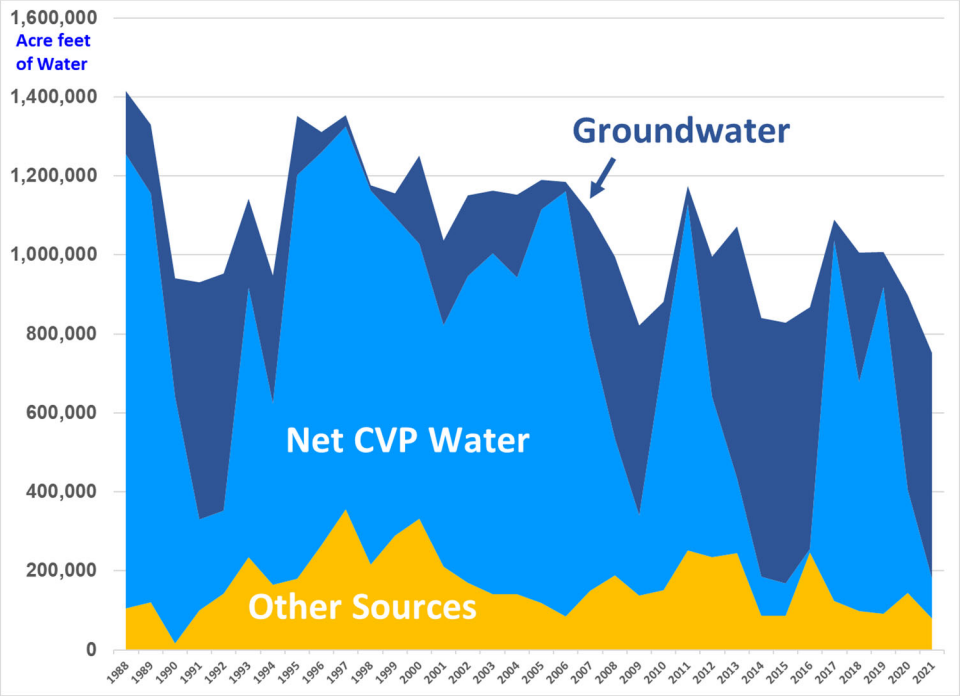
Fruit and Nuts Crops	22.9%	13.4% [a]	4.7%	3.5%
Vegetables and Melons	44.7% [a]	36.3% [a]	9.3%	5.4%
All Other	24.1% [a]	3.8% [a]	2.2%	
Total	28.1% [a]	13.1% [a]	5.2%	

[a] Includes only the share of production of farms within the Westlands Water District that are within each respective county-imputed from 2019 data.

WESTLAND WATER DISTRICT'S WATER SUPPLIES ARE HIGHLY VARIABLE

The history of Westlands Water District's water supply over the past several decades is shown in Figure 3. The surface water from the CVP, shown in light blue, fluctuates up and down while the groundwater, shown in dark blue, fills in some of the gaps in years with low allocations.

Figure ES-3—History of Water Supply in Westlands Water District, Water Years Ending 1988 to 2021



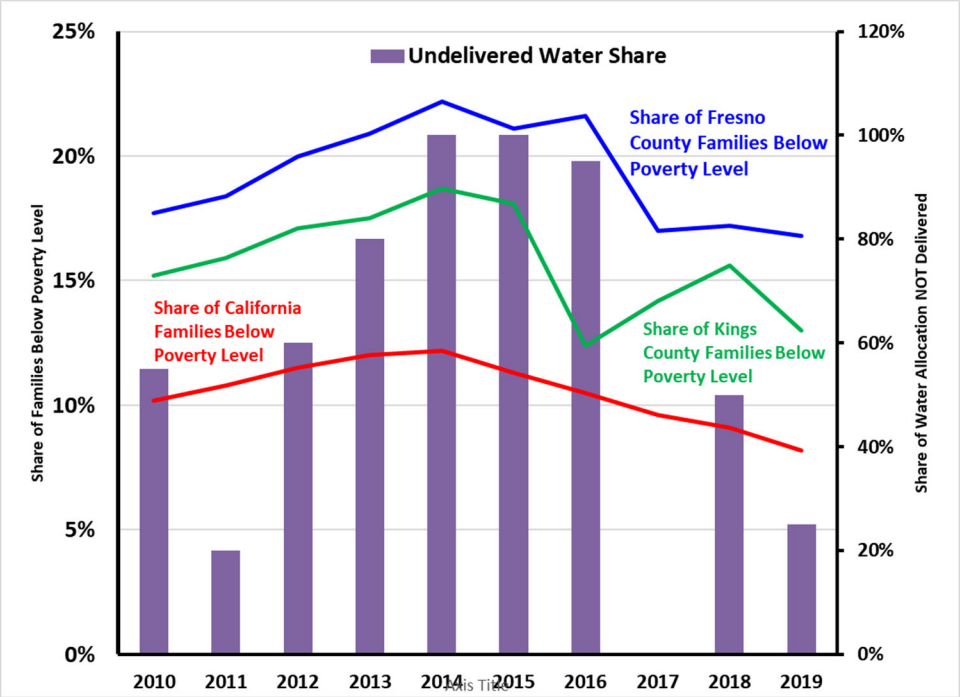
NOTE: "Net CVP Water" represents the CVP allocation adjusted for carryover and rescheduled losses. "Other Sources" includes private landowner water transfers and additional supplies acquired by the District.

Groundwater usage is higher in years when surface water is not made available. The use of groundwater is beginning to be impacted by the state's Sustainable Groundwater Management Act (SGMA) and is expected to be more of a limitation in the future—especially in periods of drought when surface supplies are constrained by policy and availability.

THE REGION SURROUNDING THE WESTLANDS WATER DISTRICT IS RELATIVELY POOR AND AGRICULTURE IS THE KEY TO ECONOMIC OPPORTUNITY

The region served by the Westlands Water District is poor compared to the state and that poverty is persistent over time. Figure ES-4 shows the trends in poverty rates for families over the past decade offset against a measure of how great the water restrictions were during the same periods (shown as vertical bars in the figure). Both Fresno (blue) and Kings Counties (green) not only show persistently higher poverty rates than the state average (red), but they are also steeper, reflecting a higher rate of growth of poverty in the region.

Figure ES-4—Percentage of Families with Incomes Below the Poverty Level, California, Kings and Fresno Counties and Undelivered Shares of Central Valley Project (CVP) Water, 2010-2019



On the right axis of Figure ES-4, the vertical bars represent the share of water from the Central Valley Project NOT delivered to the Westlands Water District in each water year. It is striking how closely the overall trend of these poverty levels in the two counties mimic the shortfalls in water deliveries from the CVP to the Westlands Water District. While not proof of causality, the visual correlation is quite high over the last decade, including significant declines in poverty rates in 2016 and 2017 when surface water was abundant in Westlands.[1] Even with the real declines in poverty rates over the past several years, poverty persists more strongly in Fresno and Kings Counties than across the state, and changes in the agricultural water supply are an important contributor to some of these trends.

[1] This is likely also impacted by changes in the minimum wage rules during the same period.

Growers in the Westlands Water District Continue to Be a Key National Resource for a Quality and Safe Food Supply

In reviewing the data for the current study, the team found that the conclusions from our 2016 study continue to be relevant today. That study found that growers in the Westlands Water District represented a key national asset in the following five areas:

1. Reliable domestic production of key foodstuffs is essential to a robust national security strategy. Especially with the labor market supply chain disruptions around COVID-19 on the production of foodstuffs and the complexities of moving goods across international borders, it is even more critical to have a predictable and reliable food supply.
2. Domestic food production continues to be held to higher quality and safety standards than production in countries from which the U.S. imports agricultural products.
3. Domestic producers must meet stringent standards to protect the environment while foreign producers, especial in Central and South America are held to lower environmental standards.
4. Labor regulation in these same foreign markets is typically much more relaxed and workers often bear greater risks for significantly less pay and benefits.
5. Production outside of the United States is often less effective at stewarding the precious resources upon which agriculture depends, including water and soil quality.

COVID-19 and Its Aftermath Also Impact the Economic Potential of the Westlands Water District's Contributions to the Economy

This analysis documents many of the beneficial economic impacts of the Westlands Water District on the local, regional, state, and national economies, however, it unfolds during a time of tremendous instability and uncertainty. There are many dimensions of the current demographic, economic, and public policy environments that could and will have significant impacts on how that impact varies in the future and, to a limited extent, how it has changed already. The final section of the analysis recognizes some of the potential challenges in each of the following areas:

- Climate change and precipitation levels: Variable precipitation patterns and volumes can and will reshape the availability of water resources throughout the state and region.
- Supply chain and support disruptions: Current and anticipated disruptions in the supply chain can and will impact how farmers get the resources they need to produce food and how those goods are brought to both domestic and international markets. Supply chain issues also affect what food can be imported into the United States, making domestically-produced crops not only more valuable, but also more reliable in politically uncertain times. Despite the current supply chain crisis, fresh fruit and produce continue to be available in the United States only because farms in California continue to provide some 80 percent of the nation's supply. If this domestic production is curtailed, it will make the nation dependent on foreign sources which are, in turn, much more subject to supply chain and transportation problems.
- Labor market shifts due to current immigration policies: Shifting labor and immigration patterns across the United States are likely to impact both the labor supply and wages for workers in the Westlands Water District's service area.
- The COVID-19 pandemic: The pandemic and the range of public policy responses to it are driving changes that impact supply chains, the overall economy, and labor markets throughout the nation, including within the boundaries of the Westlands Water District.

CONCLUSION

The economic effects of the Westlands Water District on the Fresno region, the Central Valley, the state of California, and the nation is undeniable. Westlands is a significant supplier to the nation and the world of quality fresh produce and agricultural products. In the production of that supply, it directly and indirectly employs and supports tens of thousands of households and creates billions of dollars of economic value. While there are a range of modern policy and economic crises that may influence the level of that production, there are no real domestic alternatives for production of these critical agricultural products—its climate, soil, people, and infrastructure are unique.

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INTRODUCTION

Agriculture is important to the economy of California's Central Valley. The agricultural products produced in this area are critical to meeting the food supply and food security needs of the United States and around the world. Those facts were in evidence and documented in our 2016 study and they remain today. This study revisits and updates the economic analysis released in 2016 titled *The Economic Impact of Westlands Water District on the Regional and Local Economy*. The purpose of this report is to both provide updated estimates of these impacts and to provide an update on the local community context in which these impacts play out, including an introduction to the complexities introduced by COVID-19 and associated impacts to the overall economy. Toward those ends, this report will replicate some of the descriptive aspects of our prior report while providing an updated and comparative analysis. In this way, this report can serve as a stand-alone resource for those wanting to understand the full economic impacts and context of the Westlands Water District (Westlands or District).

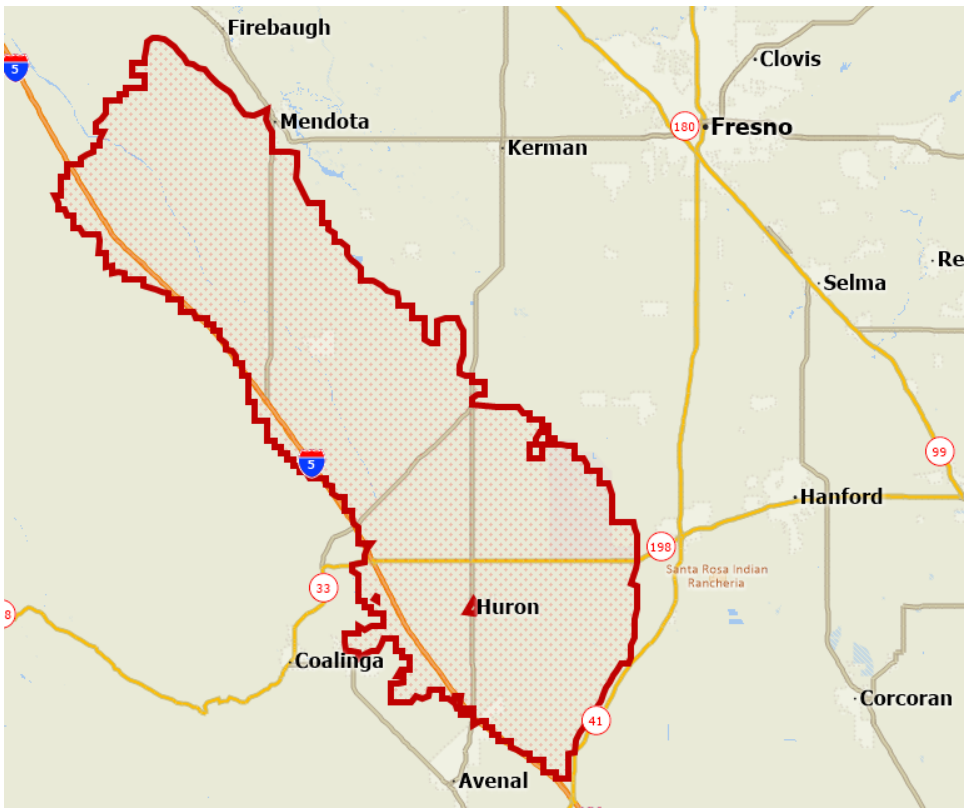
THE WESTLANDS WATER DISTRICT

To anyone who visits the Westlands Water District, the one reality that is most obvious to the observer is that agriculture ***IS*** (and continues to be) the economy in the communities within and immediately surrounding the Westlands Water District. It is an area characterized by wide open fields—often populated with crops and occasional small pockets of residential and (rarer) retail—usually at the intersections of roads. Not only is agriculture the primary employer, but government, agricultural support industries, and the limited general retail sector comprise the full course of jobs within the District and its immediate environs. Nearly every business in the District is related to agriculture or supports the needs of those working in agriculture.

The Westlands Water District sits largely on the eastern side of Interstate 5 in western Fresno County. Its eastern border generally follows the path from Firebaugh to Lemoore, while its western border reaches south to Kettleman City in Kings County. Its 1,000 square miles contains some of the richest farmland in the nation, producing approximately $2 billion in crops in 2019, with an overall economic impact of more than $4.7 billion. The land within the District itself is sparsely populated, with only one incorporated city within its borders—the City of Huron whose estimated population totals 6,206. As seen in Figure 1, it is surrounded on its edges by larger cities like

Firebaugh (pop. 8,096), Mendota (pop. 12,595), Lemoore (26,199), Avenal (12,373) and Coalinga (17,590). Fresno (pop. 542,107) is nearby and home to the District's administrative headquarters.[2]

Figure 1—Map of the Westlands Water District



SOURCE: Caliper Data Systems, Maptitude 2016.

The Westlands Water District, forged into its current scale in June of 1965 through a merger with the neighboring Westplains Water Storage District, is the largest agricultural water District in the United States. As such, it has a primary water contract with the federal government in excess of 1,150,000 acre-feet of water annually and additional contracts to transport water through its networks to the Lemoore Naval Air Station and the cities of Coalinga and Huron. In years when the federal government provides less than its contracted amounts, the District must provide less water to its customers and find additional water elsewhere. This is typically done through

[2] All population numbers are from the California Department of Finance and compiled from the 2020 decennial census. Further details can be found on the Department of Finance's website at: https://www.dof.ca.gov/Forecasting/Demographics/.

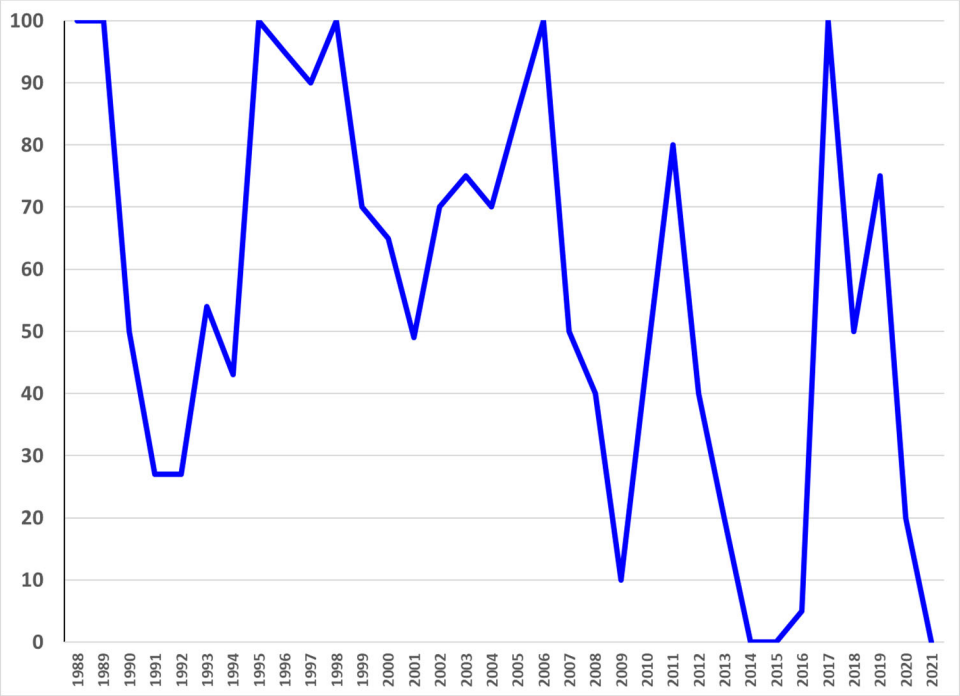
expensive purchases from other users, such as other public water agencies, or by the costly use of pumping groundwater.

Pumped groundwater is typically more expensive than the originally contracted surface water because of the investment necessary to install pumps and the electricity necessary to bring it to the surface and move it to the desired use. There is also a history of land subsidence in areas of the region if groundwater is over-used. When land subsidence occurs, it can have detrimental long-term structural impacts to conveyance systems, bridges, roads, and other facilities.

Beyond the potential for land subsidence, the use of groundwater for agricultural irrigation can also create salinity issues for crops leading to lower crop yields and possible long-term damage to permanent crops. Surface water is preferred in most applications to groundwater when it is available. However, with prospective environmental and statutory limitations on the future availability of groundwater, groundwater supplies will likely not be able to replace the shortages caused when surface water supplies are significantly reduced.

The District received its full allocation from the Central Valley Project (CVP) only three times in the past quarter-century-in 1998, 2006 and 2017, as seen in Figure 2. In the last ten years, the District has only averaged 31 percent of its contracted allocation of surface water from the CVP. In 2011, conditions were favorable enough that the District did receive 80 percent of its allocation—a threshold that has only been crossed three times out of the last twenty years. In the five years of drought from 2012 to 2016, the District received little or no water from its annual contracts with the CVP. A plentiful water year in 2017 saw Westlands receive its full contractual allocation, followed by a couple of years with lesser but significant allocations. The past two years of drought in California have seen these allocations plummet to zero.

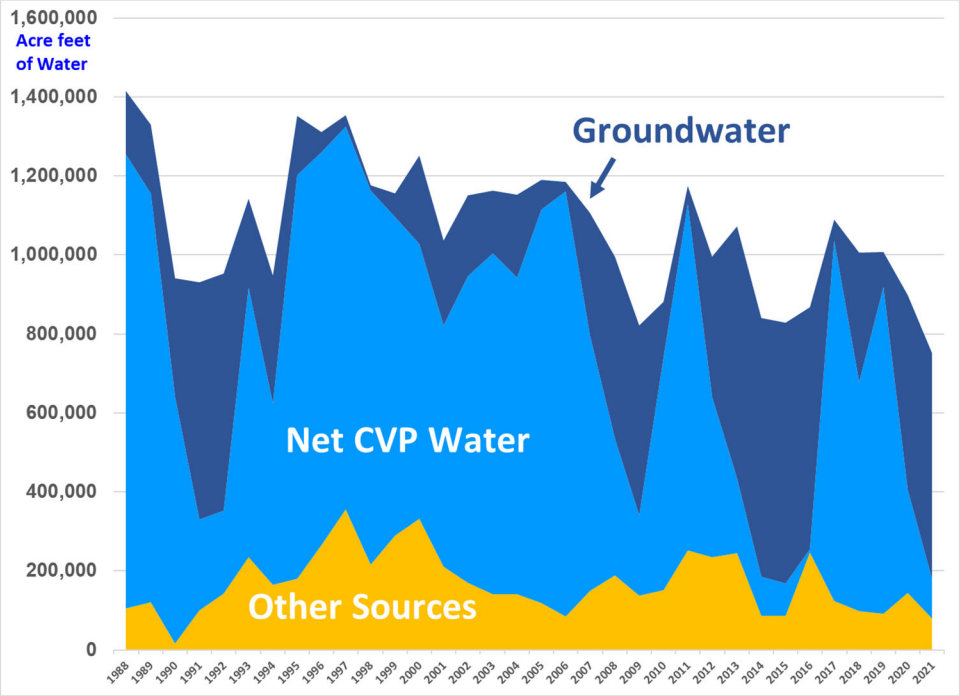
Figure 2—Net Share of Central Valley Project Water Allocation Received by Westlands Water District, 1988 to 2021



SOURCE: District data.

The history of Westlands Water District's water supply over the past several decades is shown in Figure 3. The surface water supply from the CVP, shown in light blue, fluctuates up and down while the groundwater supply, shown in dark blue, fills in some of the gaps in years with low allocations. The drought in recent years has led to a significant increase in pumped groundwater to replace the lost surface water as shown by the surge in the dark blue Groundwater area in years when light blue CVP water supply shrinks. Take note, however, of the larger downward trend in the total water supply over time. The peaks get lower, even as the valleys remain the same. This reflects a general decrease in overall water supply for the District. However, as will be discussed later, despite the downward supply trend, agricultural production has risen, due to increasingly effective use of available water supplies.

Figure 3—History of Water Supply in Westlands Water District, Water Years Ending 1988 to 2021



SOURCE: Westlands Water District data. NOTE: "Net CVP Water" represents the CVP allocation adjusted for carryover and rescheduled losses. "Other Sources" include private landowner water transfers and additional supplies acquired by the District.

Furthermore, the use of ground water is beginning to be impacted by the state's Sustainable Groundwater Management Act (SGMA). Under SGMA, water users in the areas serviced by Westlands (and other water districts) will become increasingly constrained in the amount of groundwater they can pump to replace the surface water that is not delivered because of state and federal regulations. This will have significant economic impacts going forward, especially in dry years.

This water context is important in understanding the economic structure and impact of the Westlands Water District because water supply and the cost of water, quite literally, drive the scale and character of the economic activity within the District. Water supply and water costs have also driven the District to invest heavily in technology, infrastructure and innovative farming practices that squeeze the last drop of value out of each drop of water.

OVERVIEW OF THE ECONOMIC CONTEXT AND DEMOGRAPHICS

As a major agricultural production area, Westlands Water District has an economic impact not only on local markets, but also on regional and global markets. The District's almond production, for example, is part of one of the

U.S.'s major export successes. But there are two stories involved in understanding the economic impact that Westlands Water District has on surrounding economies. The first is rooted in the reality of the towns and communities that are found in and around the District. It is critical to understand that, absent a vibrant agricultural industry, these communities would have no economic base or activity from which to draw their livelihoods. The second is rooted in the broader and more traditional economic impact analysis of how the value added of an industry in a specific location impacts not only the local communities, but also the surrounding areas and, quite possibly, the nation. The balance of this paper is broken into two sets of analyses addressing each of these threads—first, addressing the local context and second, exploring the industrial-scale impacts.

DEMOGRAPHICS OF THE REGION

Locally, the two counties served by the Westlands Water District are expected to grow by almost 400,000 people in the period from 2010 to 2060, with an average increase in population of 5.6 percent per decade, as show in Figure 4. The region of the state serviced by Westlands is expected to see a growth rate that outstrips the state of California, which is projected to increase only 3.8 percent per decade. This population is also projected to be increasingly Hispanic, rising in Fresno County from 50.4 percent in 2010 to 56.4 percent in 2060 and, in Kings County, rising from 50.9 percent in 2010 to 55.0 percent in 2060. To sustain a consistent quality of life and a stable economy, the region will need to grow the employment base significantly over this period.

However, these trends do reflect a significant adjustment to the state's overall demographic expectations. Just five years ago, when the original economic impact analysis was prepared, the state forecasted a much higher growth rate for the region and for the state overall. The state's current projections (using a 2020 baseline) show much more modest expectations of growth.

Figure 4 – Population Estimates and Projections, Fresno and Kings Counties and California, 2010-2060

Estimated and Projected Populations

Year	Fresno County	Kings County	California
2010	933,249	152,398	37,366,938
2020	1,026,358	154,745	39,800,373
2030	1,096,638	165,752	41,860,549
2040	1,170,525	176,940	43,353,414
2050	1,226,158	185,868	44,049,015
2060	1,272,559	192,955	44,228,057

Comparison to State Projections Reported in 2015 Study

State Projection for 2060 Reported in 2015 Study	1,587,852	259,506	51,663,771
Change in Projection	-19.9%	-25.6%	-14.4%

Percent Growth by Decade

Period	Fresno County	Kings County	California
2010-2020	10.0%	1.5%	6.5%
2020-2030	6.8%	7.1%	5.2%
2030-2040	6.7%	6.7%	3.6%
2040-2050	4.8%	5.0%	1.6%
2050-2060	3.8%	3.8%	0.4%

Comparisons of State Projections of Overall Growth

Growth 2010-2060 from 2015 Study	70.2%	68.2%	38.4%
Current Projected Growth 2010-2016	36.4%	26.6%	18.4%

Share of Populations Claiming Hispanic Ethnicity

Period	Fresno County	Kings County	California
2010	50.4%	50.9%	37.7%
2020	52.7%	53.2%	39.4%
2030	54.1%	54.4%	40.6%
2040	55.5%	55.1%	41.8%
2050	56.2%	55.2%	42.7%
2060	56.4%	55.0%	43.0%

SOURCE: California Department of Finance, Demographic Research Unit, baseline population projections by county, series P-1 and P-3, http://www.dof.ca.gov/Forecasting/Demographic/projections/, accessed October 12, 2021

The 2020 projections, presented in Figure 4, show a 19.9 and 25.6 percent decline in the overall number of residents in Fresno and Kings Counties, respectively, in the year 2060 relative to the same projections conducted five years ago. Statewide, the overall population projections dropped by more than seven million people—or 14.4 percent.

The demographic projections in Figure 4 reflect a more conservative estimate of the number of new Californians entering the state as well as decreased fertility among current populations and a portion of the net impacts of the exodus of Californians heading to other states (as evidenced by near zero to very slightly positive net migration estimates).

In aggregate, this has a significant effect on population change projections. The average 10-year growth rate over the period in Figure 4 for the two counties in Westlands' service area dropped from an average of 11.1 percent to 6.2 percent per decade.

Despite this slower growth, the county is expected to continue to diversify ethnically (although not as much as predicted by the 2015 study). Figure 5 shows the current and projected racial and ethnic makeup of Fresno and Kings Counties and the state. Reflecting a long-standing trend, Hispanics are the largest race/ethnic group statewide and within Fresno and Kings Counties and are expected to continue to grow as a share of the overall population, rising to almost half the statewide population by 2060.

As Figure 5 also shows, in both Fresno and Kings Counties, the percentage of both Hispanic and African-American residents is expected to grow significantly as the growth in these two groups outstrips the overall growth projected in each of the counties as well as outstripping the, already respectable, growth expected for these two groups statewide. Within Kings and Fresno Counties, however, Hispanics already comprise a majority of the population and are expected to rise to more than 55 percent in both counties by the year 2060.

It is worth noting that these growth levels are generally lower than those projected in the 2015 study, especially for Hispanics—rising by about half of prior expectations for Hispanics in Fresno County and about a third of prior expectations in Kings County. Even with these adjustments, however, the areas served by Westlands will continue to be one of the most diverse regions of the state.

Figure 5 – Projected Population, By Race/Ethnicity, Fresno and Kings Counties and California, 2010-2060

Fresno County

Year	African-American	Hispanic	Asian-PI	White	Other	Total	Percent Hispanic
2010	45,528	470,144	89,543	306,332	21,702	933,249	*50.4%*
2020	49,945	541,324	99,387	309,101	26,601	1,026,358	*52.7%*
2030	54,493	593,296	105,148	311,951	31,750	1,096,638	*54.1%*
2040	58,742	649,315	109,775	315,470	37,223	1,170,525	*55.5%*
2050	62,070	689,705	112,376	319,626	42,381	1,226,158	*56.2%*
2060	65,069	717,382	113,587	328,812	47,709	1,272,559	*56.4%*
50-year Change (2015 Report)	*42.9% (34.8%)*	*52.6% (110.7%)*	*26.9% (97.4%)*	*7.3% (-0.8%)*	*119.8% (156.0%)*	*36.4% (70.2%)*	

Kings County

Year	African-American	Hispanic	Asian-PI	White	Other	Total	Percent Hispanic
2010	10,500	77,628	5,678	54,116	4,467	152,398	*50.9%*
2020	9,786	82,387	5,639	52,020	4,913	154,745	*53.2%*
2030	10,783	90,127	5,869	53,424	5,549	165,752	*54.4%*
2040	11,869	97,457	6,156	55,247	6,211	176,940	*55.1%*
2050	12,919	102,554	6,451	57,257	6,687	185,868	*55.2%*
2060	13,795	106,030	6,753	59,337	7,040	192,955	*55.05*
50-year Change (2015 Report)	*31.4% (23.2%)*	*36.6% (101.3%)*	*18.7% (120.3%)*	*9.6% (17.8%)*	*57.6% (143.3%)*	*26.6% (68.2%)*	

California

Year	African-American	Hispanic	Asian-PI	White	Other	Total	Percent Hispanic
2010	2,193,017	14,072,650	4,968,763	15,051,585	1,080,923	37,366,938	*37.7%*
2020	2,283,480	15,681,521	5,360,026	15,187,246	1,288,100	39,800,373	*39.4%*
2030	2,438,338	16,993,646	5,511,276	15,445,731	1,471,558	41,860,549	*40.6%*
2040	2,545,427	18,126,139	5,575,757	15,439,636	1,666,455	43,353,414	*41.8%*
2050	2,594,934	18,811,087	5,549,758	15,254,786	1,838,450	44,049,015	*42.7%*
2060	2,621,128	18,996,392	5,457,751	15,165,325	1,987,461	44,228,057	*43.0%*
50-year Change (2015 Report)	*19.5% (1.4%)*	*35.0% (81.1%)*	*9.8% (66.9%)*	*0.8% (-13.2%)*	*83.9% (142.9%)*	*18.4% (38.4%)*	

SOURCE: California Department of Finance, Demographic Research Unit, baseline population projections by county, series P-1 and P-3, http://www.dof.ca.gov/Forecasting/Demographic/projections/, accessed October 12, 2021

THE ECONOMIC ROLE OF AGRICULTURE IN THE WESTLANDS WATER DISTRICT AND ITS ENVIRONS

Westlands Water District provides critical core infrastructure to the economies of two Central Valley counties—Fresno County and Kings County. While most of its operations lie within Fresno County, significant acreage is located within Kings County. While Westlands Water District does not directly supply water to the communities of Avenal, Lemoore, and Kettleman City, the District's agricultural footprint does directly impact the lives and economies of each. The agricultural sector within both of these counties is a major driver of employment and economic activity and, in some instances, such as for the City of Huron, the existence of agriculture provides the economic base upon which the entire community's existence is predicated.

THE ECONOMY OF THE DISTRICT'S REGION LAGS THE STATE

The Fresno County economy is not experiencing the same level of economic recovery experienced by the state on average. While Fresno County's labor force has shown signs of recovery from the Great Recession, COVID-19, and the state's latest drought, the unemployment rate still remains high at 9.5 percent, compared to 8.1 percent for the state overall in 2021, as seen in Figure 6. While this is closer to pre-recessionary levels, the unemployment rate in Fresno County is 17 percent higher than the overall state unemployment rate. It is also worth noting that COVID-19 has equalized this ratio quite a bit by bringing statewide employment levels down sharply. Even so, the state unemployment rate was down to 4.2 percent in 2019, compared to 7.4 percent in Fresno County.

Figure 6—Labor Force, Employment and Unemployment in Fresno County and California, 2005-2021

	Fresno County				California				
Year	Civilian Labor Force *(000s)*	Employ-ment *(000s)*	Unem-ployment *(000s)*	Unem-ployment Rate *(%)*	Civilian Labor Force *(000s)*	Employ-ment *(000s)*	Unem-ployment *(000s)*	Unem-ployment Rate *(%)*	County Rate Exceeds State By *(%)*
2021*	443.6	401.5	42.1	9.5%	18,938.1	17,404.8	1,533.4	8.1%	17.1%
2020	445.5	395.3	50.3	11.3%	18,821.2	16,913.1	1,908.1	10.2%	10.5%
2019	450.5	417.3	33.2	7.4%	19,353.8	18,550.5	803.2	4.2%	77.7%
2018	446.3	412.3	33.9	7.6%	19,263.9	18,442.4	821.5	4.3%	78.1%
2017	444.8	406.6	38.2	8.6%	19,173.8	18,246.8	927.0	4.8%	77.9%
2016	444.7	402.4	42.4	9.5%	19,012.0	17,965.4	1,046.6	5.5%	72.9%
2015	440.3	395.2	45.1	10.2%	18,824.1	17,647.4	1,176.7	6.3%	63.4%
2014	437.6	386.4	51.2	11.7%	18,676.7	17,264.5	1,412.2	7.6%	55.0%
2013	436.6	378.1	58.6	13.4%	18,565.4	16,887.9	1,677.5	9.0%	48.6%
2012	439.5	372.0	67.5	15.4%	18,484.9	16,541.0	1,943.8	10.5%	46.0%
2011	443.3	368.8	74.5	16.8%	18,406.8	16,220.6	2,186.2	11.9%	41.4%
2010	440.6	365.3	75.3	17.1%	18,370.5	16,078.5	2,292.1	12.5%	37.1%
2009	437.0	370.3	66.7	15.3%	18,306.0	16,193.1	2,112.8	11.5%	32.4%
2008	429.9	384.4	45.5	10.6%	18,179.9	16,856.1	1,323.8	7.3%	45.4%
2007	419.0	383.5	35.4	8.5%	17,910.7	16,955.4	955.3	5.3%	58.9%
2006	411.1	378.2	32.9	8.0%	17,661.2	16,797.8	863.3	4.9%	64.3%
2005	407.2	370.7	36.5	9.0%	17,537.9	16,593.6	944.3	5.4%	67.1%

SOURCE: California Employment Development Department data. * - Includes data through September 2021.

Kings County, the other county in the District's service area, is even more dependent on agriculture but lacks the diversifying impact of the large metropolis of Fresno. From an overall labor market perspective, Kings County reflects the same disparities and trends seen in Fresno County, as evidenced in Figure 7. Kings County's unemployment is at 10.0 percent, also off the highs of both the Great Recession and the recent pandemic-induced surge, but well in excess (by 23.9 percent) of the statewide unemployment rate and significantly higher than even Kings County's pre-recessionary employment levels. The size of the labor force is significantly smaller than Fresno's but the overall patterns remain similar to those seen above.

Figure 7—Labor Force, Employment and Unemployment in Kings County and California, 2005 - 2021

	Kings County				California				
Year	Civilian Labor Force *(000s)*	Employ-ment *(000s)*	Unem-ployment *(000s)*	Unem-ployment Rate *(%)*	Civilian Labor Force *(000s)*	Employ-ment *(000s)*	Unem-ployment *(000s)*	Unem-ployment Rate *(%)*	County Exceeds State By *(%)*
2021*	55.7	50.1	5.6	10.0%	18,938.1	17,404.8	1,533.4	8.1%	23.9%
2020	56.4	49.9	6.6	11.6%	18,821.2	16,913.1	1,908.1	10.2%	13.2%
2019	57.8	53.2	4.6	8.0%	19,353.8	18,550.5	803.2	4.2%	93.4%
2018	57.5	53.0	4.6	7.9%	19,263.9	18,442.4	821.5	4.3%	85.4%
2017	57.3	52.2	5.1	9.0%	19,173.8	18,246.8	927.0	4.8%	85.7%
2016	57.2	51.4	5.7	10.0%	19,012.0	17,965.4	1,046.6	5.5%	81.2%
2015	57.7	51.6	6.1	10.6%	18,824.1	17,647.4	1,176.7	6.3%	68.8%
2014	57.4	50.5	6.9	12.1%	18,676.7	17,264.5	1,412.2	7.6%	59.4%
2013	58.0	50.2	7.9	13.6%	18,565.4	16,887.9	1,677.5	9.0%	50.5%
2012	58.7	49.8	8.9	15.1%	18,484.9	16,541.0	1,943.8	10.5%	43.7%
2011	59.1	49.5	9.6	16.2%	18,406.8	16,220.6	2,186.2	11.9%	36.2%
2010	59.6	49.7	9.8	16.5%	18,370.5	16,078.5	2,292.1	12.5%	32.5%
2009	60.9	51.9	9.0	14.8%	18,306.0	16,193.1	2,112.8	11.5%	28.4%
2008	58.8	52.5	6.3	10.6%	18,179.9	16,856.1	1,323.8	7.3%	45.9%
2007	57.4	52.5	4.9	8.6%	17,910.7	16,955.4	955.3	5.3%	61.1%
2006	55.1	50.4	4.6	8.5%	17,661.2	16,797.8	863.3	4.9%	73.5%
2005	53.8	48.8	5.1	9.5%	17,537.9	16,593.6	944.3	5.4%	76.0%

SOURCE: California Employment Development Department data. * - Includes data through September 2021.

The income distribution in Fresno County is also skewed toward more low-income households, as Figure 8 shows, relative to the state. Almost one in four households in Fresno County (22.7 percent) have incomes of less than $25,000 and almost half (44.4 percent) have incomes under $50,000, producing a median household income that is 44 percent lower than the state median and an average household income that is almost $50,000 lower than the state average.

In the past five years, incomes (both median and mean) in Fresno and Kings Counties have generally risen, but at a pace much slower than the rest of California. While the number of Fresno County households making over $200,000 per year almost doubled from 3.0 percent to 5.7 percent, they are far below the statewide average of 13.7 percent of households.

Figure 8 – Household Income and Benefits, Fresno County and California, 2019

Fresno County, CA = FCC, California = Calif

Income and Benefits	FCC Number (households)	FCC Percent	FCC Cumulative Percent	Calif Number (households)	Calif Percent	Calif Cumulative Percent
Less than $10,000	24,453	7.7%	8%	601,685	4.6%	5%
$10,000 to $14,999	16,677	5.3%	13%	490,306	3.7%	8%
$15,000 to $24,999	30,663	9.7%	23%	871,341	6.6%	15%
$25,000 to $34,999	32,033	10.1%	33%	897,875	6.8%	22%
$35,000 to $49,999	36,318	11.5%	44%	1,306,618	9.9%	32%
$50,000 to $74,999	53,838	17.0%	61%	2,016,079	15.3%	47%
$75,000 to $99,999	39,127	12.4%	74%	1,645,318	12.5%	60%
$100,000 to $149,999	45,606	14.4%	88%	2,284,679	17.4%	77%
$150,000 to $199,999	20,352	6.4%	95%	1,241,231	9.4%	86%
$200,000 or more	16,907	5.4%	100%	1,802,741	13.7%	100%

Median household income (dollars)	$57,518	$80,440
Mean household income (dollars)	$76,573	$113,563
Share of households with incomes under $25,000	22.7%	14.9%
Share of households with incomes under $50,000	44.4%	31.7%

SOURCE: U.S. Bureau of the Census, American Communities Survey

The income distribution for Kings County, presented in Figure 9, looks similar as well, with only slight improvements. The share of households with incomes under $25,000 in Kings County is slightly lower than Fresno County's with 18.4 percent instead of 22.7 percent, but the share with incomes under $50,000 is essentially the same at about 43 percent.

Median household incomes are slightly higher at $58,453 (versus $57,518 for Fresno County) and mean household incomes are pretty close at $72,461 in Kings and $76,573 in Fresno County. Both are dramatically below the statewide median household income of $113,563 and the statewide mean household income of $86,704. The latter effect is likely driven by the relative absence of *very* high incomes in the small share of households with incomes in excess of $200,000.

Figure 9 – Household Income and Benefits, Kings County and California, 2019

Kings County, CA = KCC, California = Calif

Income and Benefits	KCC Number (households)	KCC Percent	KCC Cumulative Percent	Calif Number (households)	Calif Percent	Calif Cumulative Percent
Less than $10,000	2,051	4.6%	5%	601,685	4.6%	5%
$10,000 to $14,999	1,117	2.5%	7%	490,306	3.7%	8%
$15,000 to $24,999	5,074	11.3%	18%	871,341	6.6%	15%
$25,000 to $34,999	4,974	11.1%	30%	897,875	6.8%	22%
$35,000 to $49,999	6,037	13.5%	43%	1,306,618	9.9%	32%
$50,000 to $74,999	9,906	22.1%	65%	2,016,079	15.3%	47%
$75,000 to $99,999	5,707	12.7%	78%	1,645,318	12.5%	60%
$100,000 to $149,999	5,393	12.0%	90%	2,284,679	17.4%	77%
$150,000 to $199,999	2,902	6.5%	96%	1,241,231	9.4%	86%
$200,000 or more	1,600	3.6%	100%	1,802,741	13.7%	100%

Median household income (dollars)	$58,453	$80,440
Mean household income (dollars)	$72,471	$113,563
Share of households with incomes under $25,000	18.4%	14.9%
Share of households with incomes under $50,000	43.0%	31.7%

SOURCE: U.S. Bureau of the Census, American Communities Survey

In our last study, both counties had much lower income profiles than the state and the gap between the state overall and the two counties in the Westlands service area continued to widen over the 2010 through 2014 period. Part of the region's improvements relative to five years ago is likely driven by changes in the state minimum wages laws which pushed wages higher. The ability to observe and verify the expected accompanying decline in the number of available jobs (as minimum wages rise) has been confounded by the COVID-19 pandemic and its overall impacts on employment patters.

When inflation is added into the mix, the households in Fresno and Kings Counties saw an overall decrease of more than eight percent in their real household incomes. Furthermore, the number of households with annual incomes of less than $25,000 continue to grow relatively consistently each year in both Fresno and Kings Counties during that period.

The years since that analysis have seen a more optimistic story unfold for Fresno and Kings County households. For the 2015 to 2019 period, median household incomes reported in the American Communities data have generally risen, as seen in Figure 10. This is true for the state overall (growing 13.3 percent over that time), Fresno County (18.7 percent) and even more so for Kings County (rising 20.1 percent). Part of this is the concept of a rising tide raising all ships. There is some year-to-year messiness in the

data, but Fresno and Kings Counties' median household incomes remain at an average of 71 and 76 percent of the state's median household income over this period, pointing to the overall state economy as the force driving a significant part of the change.

On a per capita income basis, there is also a consistent improvement across all three geographies, although Kings County outperforms the statewide average while Fresno County grows more slowly. Figure 10 also shows the number of households with median incomes under $25,000 generally declining in Fresno and Kings Counties over this period while the state share bounces a bit and remains relatively flat.

Figure 10 – Trends in Median Household Income, California, Fresno and Kings Counties, 2015-2019

Region	2015	2016	2017	2018	2019	Change 2014-2019
Median Household Income (dollars)						
California	73,581	67,739	71,805	75,277	80,440	13.3%
Fresno County	52,651	48,715	51,800	52,629	57,518	18.7%
Kings County	52,557	53,234	57,555	61,663	58,453	20.1%
County Median Household Income Relative to State						
Fresno County	71.6%	71.9%	72.1%	69.9%	71.5%	
Kings County	71.4%	78.6%	80.2%	81.9%	72.7%	
Per Capita Income (dollars)						
California	31,587	33,389	35,046	37,124	39,393	29.4%
Fresno County	21,079	22,518	23,670	23,834	25,260	25.2%
Kings County	20,377	20,471	20,825	22,628	22,979	32.2%
Percent Households Under $25,000 Income						
California	14.8%	18,5%	17.3%	16.5%	14.9%	
Fresno County	25.1%	28.2%	24.6%	23.9%	22.7%	
Kings County	21.1%	21.0%	19.1%	16.5%	18.4%	

SOURCE: U.S. Bureau of the Census, American Communities Survey

While the number of households with median incomes under $25,000 is generally declining in both Fresno and Kings Counties, there is still a significant share of each County's population that endures the realities of poverty. As Figure 11 shows, Fresno County is one of the poorer counties in the state, with almost one in six of its households finding themselves below the poverty level—more than twice the state average. For families with children, nearly one-fourth are in poverty—again twice the state average. For female, single parent households with children, that total rises to almost half

at 44.0 percent. More than one-fifth of the population of Fresno County is in a household under the poverty level.

As discussed above, however, these numbers are improved from where the county was just five years ago when more than a fourth of the county was under the poverty level. And yet, poverty in Fresno County has shown some intransigence in that the county's improvements in reducing the number of people in poverty is lagging behind the changes statewide. For example, in 2014, the share of families in Fresno County in poverty was 80.5 percent more than the statewide average. In 2019, the share of impoverished families in Fresno County exceeded the state average by 104.9 percent, reflecting how much more slowly the local economy is moving them out of poverty.

Figure 11 – Percentage of Families and People Whose Income is Below the Poverty Level, Fresno County and California, 2019

Category	Fresno County (%)	California (%)	Exceeds California By (%)
All Families	16.8%	8.2%	104.9%
With related children under 18 years	24.5%	12.4%	97.6%
Families with female householder, no husband present	35.5%	20.2%	75.7%
With related children under 18 years	44.0%	29.5%	49.2%
All people	20.6%	11.8%	74.6%

SOURCE: U.S. Bureau of the Census, American Communities Survey Poverty patterns in Kings County, as shown in Figure 12, are also very similar, although, not as stark as those seen in Fresno County. Overall, poverty for families in Kings County is at 13.0 percent of all family households and 15.2 percent of Kings County individuals are in households below the poverty level—well above the statewide average of 11.8 percent. However, the poverty rate for single mother households with children is one of the bright spots of the past five years as the rate dropped from 51.6 percent in 2014 down to 32.6 percent in 2019—almost equaling the statewide average of 29.5 percent.

At the same time, it is important to note that, even while the proportions of households below the poverty level in Kings County are lower than those in Fresno County, they still significantly outstrip the state average; for example, the poverty rate among all individuals is 28.8 percent higher in Kings County than statewide.

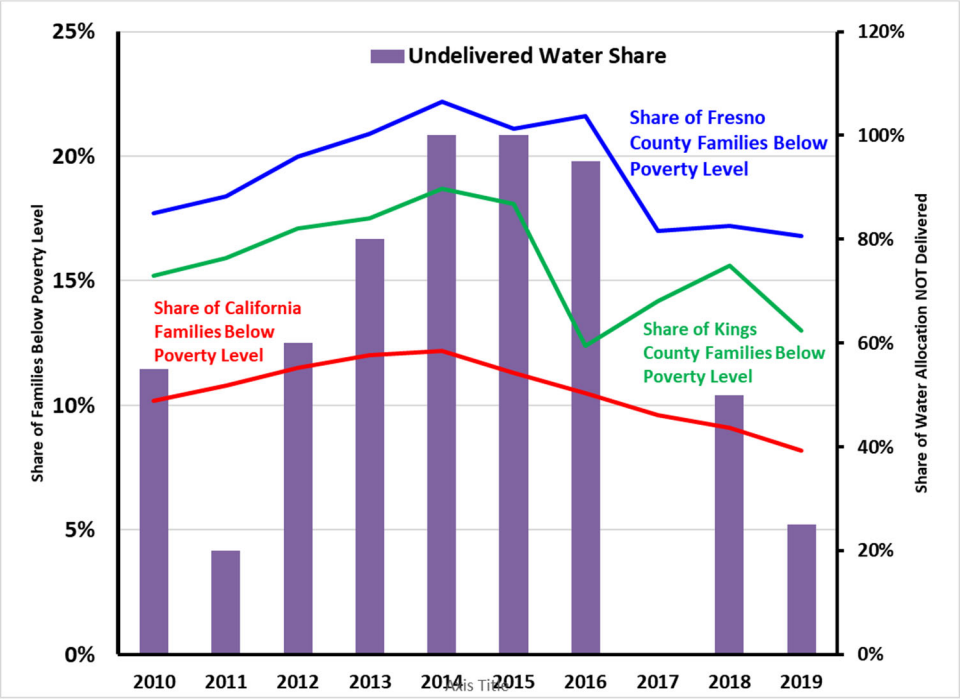
Figure 12—Percentage of Families and People Whose Income is Below the Poverty Level, Kings County and California

Category	Kings County *(%)*	California *(%)*	Exceeds California By *(%)*
All families	13.0%	8.2%	58.5%
With related children under 18 years	*17.5%*	*12.4%*	*41.1%*
Families with female householder, no husband present	27.2%	20.2%	34.7%
With related children under 18 years	*32.6%*	*29.5%*	*10.5%*
All people	15.2%	11.8%	28.8%

SOURCE: US Bureau of the Census, American Communities Survey.

The divergence between the state and Fresno and Kings Counties' poverty rates is persistent over time. Figure 13 shows the trends in poverty rates for families over the past decade offset against the undelivered share of the District's CVP contract amount during the same periods (shown as vertical bars in the figure). Both Fresno and Kings Counties not only show persistently higher rates than the state average, but they are also steeper, reflecting a higher rate of growth (and sometimes decline) of poverty in the region.

Figure 13—Percentage of Families with Incomes Below the Poverty Level, California, Kings and Fresno Counties, 2010-2019



SOURCE: US Bureau of the Census, American Communities Survey, Westlands Water District data.

Perhaps even more importantly, the overall trend of these poverty levels moves concurrently with the reductions in water deliveries from the CVP to

the Westlands Water District. While certainly not proof of causality, the visual correlation is quite high over the last decade, including significant declines in poverty rates in 2016 and 2017 when surface water was abundant in Westlands.[3] The key insight here, however, is that even with the real declines in poverty rates over the past several years, poverty persists more strongly in Fresno and Kings Counties and fluctuations in the agricultural water supply are likely important contributors to some of these changes.

It is also critical to remember that the onset of the COVID-19 pandemic follows these improvements and that, while Census data for the COVID-19 era are not yet available for households in this period, these rates will certainly surge with the onset of COVID-19 as workers lost jobs to business failures and to government imposed regulations, closures, and mandates. Add to that the need for many multi-earner households to curtail their work to care for children sent home from local schools and these numbers will be dramatically higher over the next several years.

In summary, Kings and Fresno Counties are both expected to experience significant population growth over the next few decades. They currently experience relatively high unemployment rates and an income distribution that is significantly lower than the statewide average. As a result, those in poverty, both the number of people in poverty and the share of the overall population in poverty, are rising and at a rate higher than is found statewide. Median household incomes within the region not only lag the state averages but are continuing to fall each year both in nominal and real terms.

AGRICULTURE'S ROLE IN THE WESTLANDS WATER DISTRICT ECONOMY

Employment in Fresno County is heavily reliant on agriculture. Figure 14 shows the breakdown in employment presented in the last report for the years 2010 through 2015. Direct jobs on farms accounted for more than one in eight jobs in the County during this period. This share had been dropping over those several years, as reduced crop outputs and changing crop mixes impacted the demand for farm labor in the County.

[3] This is likely also impacted by changes in the minimum wage rules during the same period.

Figure 14—Employment by Census-defined Industry Category, Fresno County, 2010-2015

Jobs by Industry	2010	2011	2012	2013	2014	2015
Farm Jobs	46,000	47,900	48,900	49,200	48,800	47,300
Mining, Logging & Construction	12,200	11,700	12,400	13,400	14,200	15,200
Manufacturing	24,100	23,800	23,700	23,000	24,000	25,500
Trade, Transportation & Utilities	55,100	57,300	58,200	60,700	61,900	63,500
Services	132,100	132,700	135,400	141,000	146,500	151,600
Government	67,100	65,700	64,100	64,200	66,300	68,800
Total Employment	**336,600**	**339,100**	**342,700**	**351,500**	**361,700**	**371,900**
Percent Employment by Industry	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Farm Jobs	13.7%	14.1%	14.3%	14.0%	13.5%	12.7%
Mining, Logging & Construction	3.6%	3.5%	3.6%	3.8%	3.9%	4.1%
Manufacturing	7.2%	7.0%	6.9%	6.5%	6.6%	6.9%
Trade, Transportation & Utilities	16.4%	16.9%	17.0%	17.3%	17.1%	17.1%
Services	39.2%	39.1%	39.5%	40.1%	40.5%	40.8%
Government	19.9%	19.4%	18.7%	18.3%	18.3%	18.5%
Total Employment	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Statewide - Farm Share of Jobs	**2.6%**	**2.6%**	**2.6%**	**2.6%**	**2.6%**	**2.6%**
Statewide - Food Mfg Share of Jobs	**1.0%**	**1.0%**	**1.0%**	**1.0%**	**1.0%**	**0.9%**
Statewide - Manufacturing Share of Jobs	**8.5%**	**8.4%**	**8.3%**	**8.1%**	**8.0%**	**7.8%**

SOURCE: California Employment Development Department data.

Figure 15 presents updated data for this overview of the Fresno County economy for the period 2015 through 2020. Most striking in this chart is the continued slow decline in farm jobs from their peak in 2012 and 2013 through 2019. From 2015 to 2019, the farm jobs declined from one in eight jobs in the region to one in nine. In 2020, there was another sharp drop, fueled in part by continued declines in water availability and in part by the disruptions that COVID-19 imposed on agricultural communities and farm production. Interestingly, agriculture's statewide share of employment has declined only slowly from 2.6 percent to 2.4 percent over this decade. 2020 saw a slight uptick to 2.5 percent as other parts of the economy suffered due to COVID-19. Another important measure of agriculture's importance to the economy is the fact that one in eight manufacturing jobs in the state is related to agriculture.

Figure 15—Employment by Census-defined Industry Category, Fresno County, 2015-2019

Jobs by Industry	2015	2016	2017	2018	2019	2020
Farm Jobs	47,300	46,900	46,100	44,200	44,100	41,100
Mining, Logging & Construction	15,300	16,400	17,700	19,000	19,300	18,900
Manufacturing	25,500	25,200	25,600	25,900	26,200	25,800
Trade, Transportation & Utilities	63,400	66,100	67,000	68,800	70,000	70,000
Services	151,700	157,900	161,300	165,900	172,600	161,900
Government	68,700	71,000	72,600	74,500	75,200	72,500
Total Employment	**371,900**	**383,500**	**390,300**	**398,300**	**407,400**	**390,200**
Percent Employment by Industry	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Farm Jobs	12.7%	12.2%	11.8%	11.1%	10.8%	10.5%
Mining, Logging & Construction	4.1%	4.3%	4.5%	4.8%	4.7%	4.8%
Manufacturing	6.9%	6.6%	6.6%	6.5%	6.4%	6.6%
Trade, Transportation & Utilities	17.0%	17.2%	17.2%	17.3%	17.2%	17.9%
Services	40.8%	41.2%	41.3%	41.7%	42.4%	41.5%
Government	18.5%	18.5%	18.6%	18.7%	18.5%	18.6%
Total Employment	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Fresno County - Farm Share of Jobs	**12.7%**	**12.2%**	**11.8%**	**11.1%**	**10.8%**	**10.5%**
State - Farm Share of Jobs	***2.6%***	***2.5%***	***2.4%***	***2.4%***	***2.4%***	***2.5%***
Fresno County - Mfg Share of Jobs	**6.9%**	**6.6%**	**6.6%**	**6.5%**	**6.4%**	**6.6%**
State - Mfg Share of Jobs	***7.9%***	***7.7%***	***7.6%***	***7.5%***	***7.4%***	***7.6%***
State - Food Mfg Share of Mfg Jobs	***12.1%***	***12.3%***	***12.5%***	***12.3%***	***12.3%***	***12.2%***

SOURCE: California Employment Development Department data.

Kings County's economy is even more dependent on agriculture than Fresno County's, as seen in Figures 16 and 17. Farm employment accounts for one in six jobs in Kings County compared to one in nine jobs in Fresno County. Government employment in Kings County is a major driver, accounting for almost one-third of all jobs, whereas it only accounted for 18.6 percent of Fresno County employment in 2019. In fact, government employs nearly twice the number of people directly employed on farms in Kings County.

Figure 16—Employment by Census-defined Industry Category, Kings County, 2010-2015

Jobs by Industry	2010	2011	2012	2013	2014	2015
Farm Jobs	6,600	6,200	6,500	6,900	6,900	7,500
Mining, Logging & Construction	900	900	800	800	800	900
Manufacturing	4,100	4,300	4,400	4,500	4,600	4,900
Trade, Transportation & Utilities	5,200	5,300	5,400	5,600	5,700	5,800
Services	11,500	11,300	11,600	11,800	12,300	12,400
Government	15,000	14,800	14,600	14,300	14,300	14,500
Total Employment	**43,300**	**42,800**	**43,300**	**43,900**	**44,600**	**46,000**

Percent Employment by Industry	2010	2011	2012	2013	2014	2015
Farm Jobs	15.2%	14.5%	15.0%	15.7%	15.5%	16.3%
Mining, Logging & Construction	2.1%	2.1%	1.8%	1.8%	1.8%	2.0%
Manufacturing	9.5%	10.0%	10.2%	10.3%	10.3%	10.7%
Trade, Transportation & Utilities	12.0%	12.4%	12.5%	12.8%	12.8%	12.6%
Services	26.6%	26.4%	26.8%	26.9%	27.6%	27.0%
Government	34.6%	34.6%	33.7%	32.6%	32.1%	31.5%
Total Employment	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Statewide - Farm Share of Jobs	**2.6%**	**2.6%**	**2.6%**	**2.6%**	**2.6%**	**2.6%**
Statewide - Food Mfg Share of Jobs	**1.0%**	**1.0%**	**1.0%**	**1.0%**	**1.0%**	**0.9%**
Statewide - Manufacturing Share of Jobs	**8.5%**	**8.4%**	**8.3%**	**8.1%**	**8.0%**	**7.8%**

SOURCE: California Employment Development Department data.

The overall share of jobs across each sector of the economy has remained relatively stable over the past ten years, although there have been very modest gains in the number of farm jobs through 2017 when subsequent limits on water availability began to adversely affect agricultural hiring. It is also important to note that a significant share of the manufacturing jobs in Kings County are agricultural-related jobs processing the products of its farmlands.

Figure 17 – Employment by Consensus-defined Industry Category, Kings County, 2015-2019

	2015	2016	2017	2018	2019	2020
Jobs by Industry						
Farm Jobs	7,400	7,400	7,800	7,600	7,500	7,200
Mining, Logging & Construction	900	900	900	1,000	1,000	900
Manufacturing	4,900	4,800	4,900	4,900	4,900	4,600
Trade, Transportation & Utilities	5,900	6,300	6,700	7,200	7,200	6,700
Services	12,400	12,300	12,700	13,000	13,200	12,700
Government	14,500	14,700	14,700	14,900	15,100	14,300
Total Employment	**46,000**	**46,400**	**47,700**	**48,600**	**48,900**	**46,400**
Percent Employment by Industry						
Farm Jobs	16.1%	15.9%	16.4%	15.6%	15.3%	15.5%
Mining, Logging & Construction	2.0%	1.9%	1.9%	2.1%	2.0%	1.9%
Manufacturing	10.7%	10.3%	10.3%	10.1%	10.0%	9.9%
Trade, Transportation & Utilities	12.8%	13.6%	14.0%	14.8%	14.7%	14.4%
Services	27.0%	26.5%	26.6%	26.7%	27.0%	27.4%
Government	31.5%	31.7%	30.8%	30.7%	30.9%	30.8%
Total Employment	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Kings County - Farm Share of Jobs	16.1%	15.9%	16.4%	15.6%	15.3%	15.5%
State – Farm Share of Jobs	2.6%	2.5%	2.4%	2.4%	2.4%	2.5%
Kings County – Mfg Share of Jobs	10.7%	10.3%	10.3%	10.1%	10.0%	9.9%
State – Farm Share of Jobs	7.9%	7.7%	7.6%	7.5%	7.4%	7.6%
State – Food Mfg Share of Mfg Jobs	12.1%	123%	12.5%	12.3%	12.3%	12.2%

SOURCE: California Employment Development Department data.

At the same time, these tables understate the true impact of farming on the local economy. For each farm job identified in Figures 14 through 17, the regional economic models[4] predict there will be another 1.49-1.75 jobs directly related to providing support activities for agriculture in activities such as packing, soil preparation, processing, labor management, etc. In another study about agriculture's impact on the southern California economy published in 2012, 195,000 farming jobs directly supported some 198,000 jobs in agricultural processing and another 187,000 jobs in "Ag-support

[4] From IMPLAN regional modeling multiplier tables.

activities."[5] When the full economic impact of these farming jobs was counted, each farming job was associated with nearly 2.18 additional jobs elsewhere in the economy and each job in processing created by this production was associated with another 3.33 jobs. While there is some variation by region, it is likely that the regional models for the two-county region are conservative in their estimations because they are only capturing economic impacts of economic activity within the specified region (Fresno and Kings Counties) while the southern California models capture a broader sense of the impacts that agricultural output region has on production that happens elsewhere in the state.

But the "Farm Jobs" category denoted in Figures 14 through 17 and these multipliers tell only part of the story. Within all the employment sectors denoted in these tables are employers and businesses for who significant shares of their businesses are dependent on agricultural customers—especially in the areas of transportation, retail sales, and business services. While the multipliers capture the incremental impact of employment and economic impacts of direct agricultural production for some of these companies, many of the retailers who sell farm equipment, vehicle fuel, plumbing and irrigation supplies, etc. are heavily dependent on agricultural customers. Thus, the impact of losing sales across the sector adds up quickly. At some point, much as is the case with farmers, there comes a tipping point where the entire firm goes out of business. When this happens, the overall impact on employment is much greater than the marginal impacts identified in the regional impact models because the entire staff becomes unemployed. Even in the government employment sector, these impacts are significant. As agricultural employment in the region declines, as is seen in Figure 14 in Fresno County, agricultural workers are forced to migrate to other regions of the state. This in turn leads to fewer residents in the region and thus lower enrollment in local schools and thus fewer dollars to hire teachers and staff and purchase materials and supplies in the local school Districts. These impacts are likely to be exacerbated as limited access to water supplies and shifting crop mixes put downward pressure on the core agricultural employment base in the region.

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[5] Vergati, Jessica A. and Daniel A. Sumner, *Contributions of Agriculture to Employment and the Economy in Southern California*, University of California Agricultural Issues Center, July 2012, p. 45.

Another way to see the importance of agriculture in the region is to look at its major employers. The major employers in Fresno County also reflect the strong and dominant role of agriculture to the local economy, as shown in Figure 18.

Figure 18 – Major Employers in Fresno County, Grouped by Size, Employers with more than 500 Employees, 2021

Employer Name	Location	Industry	Size
Community Regional Medical Ctr	Fresno	Hospitals	5,000-9,999 Employees
County of Fresno	Fresno	Government Offices - County	5,000-9,999 Employees
State Center Community College	Fresno	Schools-Universities & Colleges	5,000-9,999 Employees
Air National Guard	Fresno	Veterans & Military Organizations	1,000-4,999 Employees
Amazon	Fresno	Distribution Services	1,000-4,999 Employees
California State University, Fresno	Fresno	Schools-Universities & Colleges	1,000-4,999 Employees
California State Hospital – Coalinga	Coalinga	Government-Specialty Hosp	1,000-4,999 Employees
California Teaching Fellows	Fresno	Employment Service-Govt Co Fraternal	1,000-4,999 Employees
Cargill Meat Solutions	Fresno	Meat Packers (manufacturers)	1,000-4,999 Employees
City of Fresno	Fresno	Government Offices – Local	1,000-4,999 Employees
Clovis Unified School District	Clovis	Schools – K-12	1,000-4,999 Employees
Foster Farms	Fresno	Poultry Farms	1,000-4,999 Employees
Fresno VA Hospital Medical Center	Fresno	Government-Specialty Hosp	1,000-4,999 Employees
Internal Revenue Service	Fresno	Government Offices-Federal	1,000-4,999 Employees
Kaiser Permanente Fresno Medical Cntr	Fresno	Hospitals	1,000-4,999 Employees
Lion Dehydrators	Selma	Dehydrating Services	1,000-4,999 Employees
Pacific Gas and Electric	Fresno	Utilities	1,000-4,999 Employees
Phebe Conley Art Gallery	Fresno	Art Galleries & Dealers (Part of Fresno State University)	1,000-4,999 Employees
Pitman Farms	Sanger	Farms	1,000-4,999 Employees
Pleasant Valley State Prison	Coalinga	Government Offices-State	1,000-4,999 Employees
Shehadey Pavilion At St Agnes	Fresno	Hospitals	1,000-4,999 Employees
St Agnes Medical Ctr	Fresno	Hospitals	1,000-4,999 Employees
Stamoules Produce Co	Mendota	Fruits & Vegetables & Produce - Retail	1,000-4,999 Employees
Wawona Frozen Foods, Inc	Clovis	Frozen Food Processors	1,000-4,999 Employees
Gap Pacific Distribution Center	Fresno	Distribution Services	500-999 Employees
Pelco Inc	Fresno	Security Control Equip & Systems	500-999 Employees
Save Mart Center	Fresno	Stadiums Arenas and Athletic Fields	500-999 Employees
Sun Maid Growers	Kingsburg	Fruit & Vegetable & Produce	500-999 Employees
Table Mountain Casino	Friant	Casinos	500-999 Employees

SOURCE: California Employment Development Department data with updates from California Central Valley Economic Development Center (www.centralcalifornia.org)

While the list of largest employers is dominated by government, hospitals, and educational institutions (15 out of the 29 listed), half of the remaining private employers are farming and agricultural-related. Seven out of the fourteen non-government/health/education employers with more than 500

employees are agriculturally based. Agriculture is the dominant private contributor to the Fresno County economy.

Figure 19 – Major Employers in Kings County, Grouped by Size, Employers with More than 100 Employees, 2021

Employer Name	Location	Industry	Size
Lemoore Naval Air Station	Lemoore	Government Offices-US	5,000-9,999 Employees
Adventist Health	Hanford SATF	Hospitals	5,000-9,999 Employees
California State Prisons	Corcoran Avenal	Food Products & Manufacturers	5,000-9,999 Employees
Hanford Community Med Center	Hanford	Health Services	5,000-9,999 Employees
Hanford Regional Healthcare	Hanford	Physicians & Surgeons	1,000 - 4,999 Employees
Kings County	Hanford	Government Offices-County	1,000 - 4,999 Employees
Kings County School Districts	Various	Schools – K-12	1,000 - 4,999 Employees
Leprino Foods Co	Lemoore	Cheese Processors (manufacturers)	1,000 - 4,999 Employees
Olam Tomato Processors	Lemoore	Tomato Processors (manufacturers)	1,000 - 4,999 Employees
Tachi Palace Hotel & Casino	Lemoore	Casinos	1,000 - 4,999 Employees
Walmart Supercenter	Hanford	Department Stores	500 – 999 Employees
Central Valley Meat Co Inc	Hanford	Meat Packers (manufacturers)	500 – 999 Employees
Lemoore High School	Lemoore	Schools	500 – 999 Employees
Marquez Brothers Intl Inc	Hanford	Mexican Food Products-Wholesale	250 – 499 Employees
Naval Hospital - Lemoore	Lemoore	Hospitals	250 – 499 Employees
Warmerdam Packing	Hanford	Fruits & Vegetables-Growers & Shippers	250 – 499 Employees
Zepeda's Farm Labor Svc	Corcoran	Labor Contractors	250 – 499 Employees
Badasci & Wood Transport	Lemoore	Trucking	250 – 499 Employees
Hanford Sentinel	Hanford	Newspapers (publishers/manufacturers)	250 – 499 Employees
Excelsior Farming	Hanford		250 – 499 Employees
J G Boswell Co	Corcoran	Manufacturers - Wine Barrels	250 – 499 Employees
Keller Ford Lincoln	Hanford	Automobile Dealers-New Cars	100 – 249 Employees
Lemoore Main Navy Exchange	Lemoore	General Merchandise – Retail	100 – 249 Employees
Nichols Farms, Inc	Hanford	Farms	100 – 249 Employees
Shiny Sugar	Hanford	Sugar Refiners (manufacturers)	100 – 249 Employees
TC Transcontinental Packaging	Hanford	Plastics-Foil & Coated Paper Bags	100 – 249 Employees
West Hills College-Lemoore	Lemoore	Schools-Universities & Colleges	100 – 249 Employees

SOURCE: California Employment Development Department data with updates from California Central Valley Economic Development Center (www.centralcalifornia.org).

Kings County shows a similar pattern. Its list of major employers shown in Figure 19 reflects this dependence on government and agriculture for employment. Of the 28 top employers, 10 are again hospitals, governments, or educational institutions—fewer than Fresno County. Of the remaining 18, two-thirds (12 out of 18) are agriculturally-related. Given the relatively

smaller size of the economy, the firms are also smaller, but agriculture dominates.

These profiles are almost identical to those of five years ago. The bottom line is that both Fresno and Kings Counties continue to be heavily dependent on agriculture to fuel their local economies. Significant degradations in this sector will likely impact the counties' already-elevated poor populations and put increasing impacts on the social safety net and infrastructure of the region. While the thrust of assessing the potential risks of this dependence is left for a later study, the analysis will now turn to the direct economic impacts associated with the operations of the Westlands Water District.

UNDERSTANDING THE BROADER IMPLICATIONS OF WESTLANDS WATER DISTRICT'S ECONOMIC IMPACT AT THE INDUSTRY LEVEL

The economic impact of the Westlands Water District is primarily driven by the output of its two main customer bases: farmers growing crops in the District and the businesses and governments in the area who rely on the Westlands Water District to transport water for their uses. In the latter case, the District provides infrastructure to transport water from the state and federal water projects to customers in adjoining communities, such as the Lemoore Naval Air Station, and the cities of Huron and Coalinga. In these instances, the District does not provide water treatment for these customers, but rather delivery of the water to their sites for handling and treatment. Since each of these jurisdictions is then responsible for preparing the water for customer and business uses, this analysis will not include an economic impact footprint for these communities other than the transport function. However, the Westlands Water District does play a vital role in each of these communities since they would need to replace Westlands with another service provider absent its deliveries to them.

On the agricultural side, however, Westlands Water District's provision of water resources and infrastructure leads directly to the creation of economic value in the form of crops and the business of creating them. Whether it is through the direct delivery of "allocated," transferred, or purchased water; the provision of transport infrastructure; or the measuring, tracking, and pricing locally-derived water supplies, the Westlands Water District plays a leading role in the creation of farm products that have measurable and direct economic benefits.

The extent of agricultural crop production within the Westlands Water District is considerable, as shown in Figure 20, totaling nearly $1.76 billion of estimated crop value in 2015 and $1.95 billion in 2019.

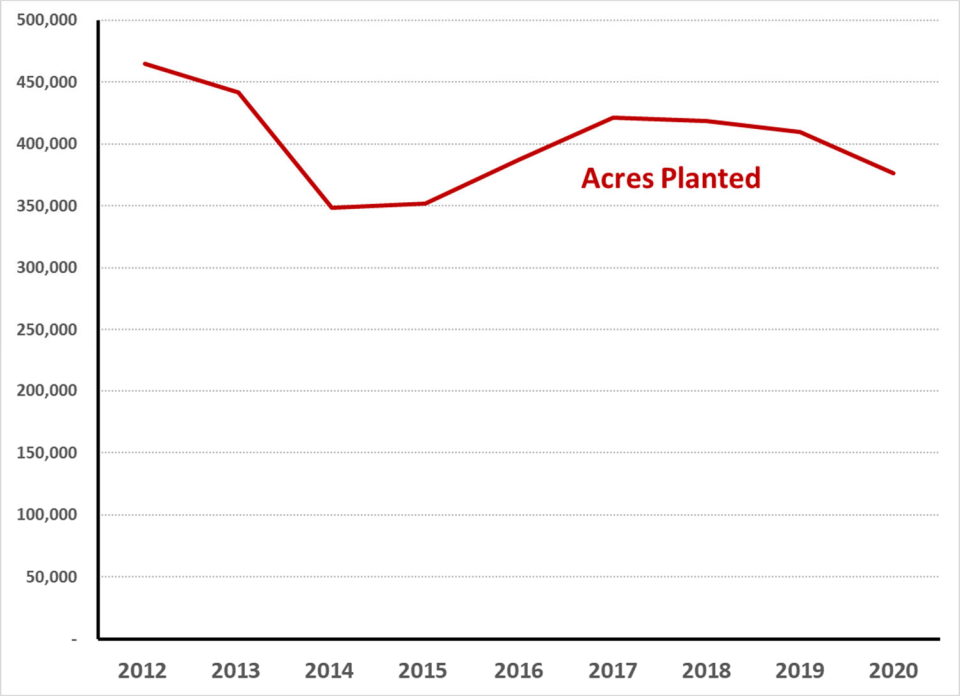
Figure 20—Estimated Crop Acreage and Value with the Westlands Water District, 2015 and 2019 Growing Seasons

Sector	2015 Acres	2015 Estimated Value	2019 Acre	2019 Estimated Values
Grain farming	33,187	25,334,037	18,013	11,950,542
Vegetable and melon farming	109,947	573,137,179	118,540	768,193,284
Fruit farming	27,166	160,801,620	27,704	168,452,354
Tree Nut farming	149,324	869,169,854	176,803	841,075,935
All other crop farming	32,269	132,318,569	68,447	157,220,952
Total Farming	**351,893**	**$1,760,761,260**	**409,507**	**$1,946,893,067**

SOURCE: District data and Fresno Farm Bureau *Annual Crop Report, 2014, Annual Crop Report 2019.*

Crop values are influenced not only by the amount of acreage planted, but also the yields on these parcels (units of crops produced per acre), and market prices. In terms of productive acreage, the 2019 growing season saw an increase in 16.4 percent increase in acres relative to the 2015 growing season. However, these need to be considered in the longer-term sequence of acres of crops planted rather than the point-to-point comparison. Figure 21 shows the number of cropped acres for the past several years. The cycles in this diagram correspond almost exactly to the level (share of contractual allocation) of water made available to Westlands through its CVP contracts.

Figure 21—Westlands Water District Estimated Acres Planted, 2012 – 2020 Growing Seasons



SOURCE: District data.

FARMING SERVES AS THE REGION'S ECONOMIC ENGINE

Farming, as an economic process, functions much like many natural resource-driven industries. One must first find a location that has the critical resources available to produce the product in question. For mining, as an example, it is the presence of the requisite ores in enough concentrations to be commercially feasible to harvest. In the case of farming, one must find locations with the right types of soils, farmable geography (mostly flat), appropriate growing seasons, consistently mild (or predictable) weather patterns, and water. The Central Valley is richly endowed with all but the last of these—water.

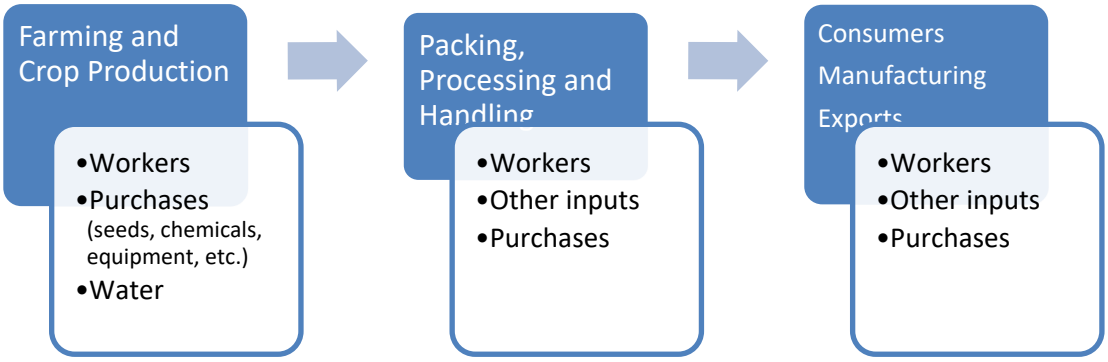
California and the U.S. government, with unusual foresight and planning, addressed the need for water by investing, in partnership with local landowners, in the infrastructure to provide water in commercially viable quantities and, as a result, California produces the vast majority of fresh produce, nuts and vegetables consumed in the United States and, for some types of products, the world. In Westlands' case it was the foresight of the federal government that led to the Central Valley Project and its resulting production.

While the current drought combined with state and federal regulatory actions have hampered the effective functioning of this system, farmers in the state's Central Valley have adapted to this changing environment through the use of technology and modified planting strategies. This has resulted in some significant changes to local planting patterns in recent years that, if sustained into the future, will affect the price and portfolio of fruits and vegetables available to consumers.

To produce these crops, the farmers hire employees; buy seed, fertilizers, farm equipment, fuel, water, irrigation equipment and supplies, fuel, and other supplies; hire attorneys, accountants, consultants, and other experts; build facilities, homes, and roads; and, in today's tech-savvy farming, develop computer and electronic monitoring infrastructure to track the status of their crops in real time. All of these activities contribute to the economic footprint of their farming activities.

Beyond this, as Figure 22 shows, these crops are then transported to other locations for packing and processing for eventual distribution to consumers, food product manufacturing, animal feeding, and other uses—both locally, domestically, and internationally. Within each of these steps in the food production process, additional inputs are required including labor (workers), infrastructure, production inputs (e.g., containers, electricity, other food products, etc.), and utilities like vehicle fuel, electricity, and gas.

Figure 22—Model of Farming's Economic Impact



Each of the steps in the production process is dependent on the preceding steps and factors—affecting one step in the process will affect the prices, will restrict supplies, or will result in fewer crops, which will in turn result in less produce available for packaging or processing, and eventually less produce available to food manufacturers and consumers. This ripple effect is important in estimating the economic impact that farming has because it goes

beyond the traditional "multipliers" people think of in economic processing to affect other entire sectors of the economy.

ESTIMATING THE ECONOMIC IMPACT OF THE WESTLANDS WATER DISTRICT

To estimate the economic impact of the Westlands Water District, this analysis will look at three components of its role in the local economy: (1) the economic value of the crops produced by the farmers who use its water and water infrastructure; (2) the economic value associated with the secondary markets that take these crops to their ultimate market destination; and (3) the economic value of the goods and services directly purchased by the District to provide the water infrastructure and services incumbent in its mission and business model. Each of these components is analyzed and aggregated to provide an overall impact.

METHODOLOGY

To estimate the economic impact of the three areas listed above, the primary economic value of each of the activities was inputted into the IMPLAN® economic modeling program. IMPLAN is the industry standard for providing economic impact analyses of specific activities. It is an "input-output" type simulation model that uses detailed economic data to calibrate its estimates of the subsequent impacts of various economic and policy-related activities. It breaks the economy down into approximately 400 sectors and uses detailed coefficient matrices to estimate the dynamic effects of policy choices through multiple iterations of impacts.

IMPLAN requires breaking the policy or impact to be analyzed into specific activities that fit its framework of sectors. With these inputs the model then provides the detailed impacts on employment, total economic output, proprietor income, labor income, and government tax revenues.

Generally, there are four steps to building these models: (1) defining the geography for the modeling; (2) breaking the policy or entity's impact into the requisite model sectors; (3) inserting them into the model; and (4) assembling and interpreting the results from the many scenarios.

For purposes of this analysis, Fresno County-level data were used to assess the economic impacts. Similar models were constructed using census tract-delineated boundaries for the District and building separate models for both

the Fresno and Kings County components of the Westlands Water District, however, those results are excluded here because adding the complexity associated with each did not materially affect the findings, presented here, using the Fresno County-based model. Crop acreage data were combined with the most recent available valuation information published in the Fresno County *2019 Annual Crop & Livestock Report*[6] to estimate crop values. Industry-specific studies of Secondary Agricultural Production levels were reviewed in combination with geographically-generated estimates from the IMPLAN model's 2019 data to create the requisite estimates of Secondary Agricultural Production valuations. Finally, sensitivity analyses were prepared for each to ensure that the uncertainty around each estimate did not materially reverse any of the findings presented here.

DATA AVAILABILITY

In preparing this economic impact analysis, data from the 2019 agricultural year were used to estimate the economic impacts described in this report. This is driven by the fact that detailed crop and crop valuation data were not yet available for the 2020 crop year. COVID-19 and the disruptions it introduced to the workflow and employment models in both the public and private sectors has delayed the timely release of the data that normally would be used in this analysis.

Preliminary crop acreage data for the 2020 crop year were available at the time of this analysis. To assess the robustness of the results, these available data were compared to the year used in this analysis. Figure 23 shows a comparison of the data for acres grown by crop type in the Westlands Water District for the 2019 and 2020 crop years.

[6] It should be noted that while the 2020 Kings County crop report was available to the author, the narrow range of crops detailed there limited its usefulness for building the models. COVID-19-related issues delayed the availability of the Fresno County Annual Crop Report, thereby limiting our ability to properly value and model the most recent acreage data available from 2020. Some sensitivity around this question will be provided later in this section.

Figure 23—Comparison of Acreage Planted in the

Westlands Water District, 2019 and 2020

Sector	2019	2020
Oilseed farming	120	191
Grain farming	18,013	15,325
Vegetable and melon farming	118,540	113,319
Fruit farming	27,704	27,525
Tree Nut farming	176,803	193,066
Horticulture and nursery	-	-
All other crop farming	68,327	27,148
Total Acres Planted	**409,507**	**376,574**

SOURCE: Westlands Water District data.

Figure 23 shows that there was an eight percent reduction in the acreage planted between 2019 and 2020, with the largest part of the shift coming in the "All other crop farming category," which was accounted for, mostly, by decreases in acreage producing cotton and hay. In fact, if the crop yield and value multipliers from 2019 are applied to the 2020 acreage totals, the total crop yield only decreases 3.7 percent, well within the tolerable error limits for an analysis of this time. The bottom line is that we believe that the estimates using the available data that are included in this analysis will fairly represent a reasonable estimate of the current economic footprint of the Westlands Water District.

WESTLANDS WATER DISTRICT HAS A MAJOR ECONOMIC IMPACT

With the methodological issues addressed, it is possible to estimate the overall impact of the operations of Westlands Water District on the economy. Figure 24 provides the results of this analysis.

Westlands Water District, in aggregate, is directly and indirectly responsible for some $4.7 billion dollars of economic activity and nearly 35,000 jobs across the economy. Most of these impacts are through what the model calls "direct effects"—specifically through the growing of agricultural products and the value added associated with the processing and handling of those products—representing some $2.9 billion of the economic impact and more than 25,000 jobs.

"Indirect effect" impacts, which account for another $757 million in economic impacts, are the economic activity associated with the activities necessary to accomplish the main production process but are not actually part of it. For example, when a farmer buys a truck to haul produce as part of their

operation, this will create jobs in the truck manufacturing sector as the demand for trucks goes up by one. In this case it generally represents the economic activity fueled by the non-labor inputs necessary to farm—including things like chemicals, planting and harvesting equipment, irrigation equipment and supplies, electricity, seed, spare parts, etc. It is worth noting that while these indirect impacts are proportionately smaller than the direct effects, this difference is NOT a measure of profitability. This model looks more directly at the value added of the activities, not their relative profitability.

Figure 24—Overall Economic Impact of the Westlands Water District, 2019

EMPLOYMENT	Jobs Created	Share
Direct effects of agricultural production	25,239.9	71.9%
Economic impact due to inputs to agricultural production (indirect effects)	3,004.7	8.6%
Impacts due to increased employee income and consumption (induced effects)	6,869.9	19.6%
TOTAL EFFECT	**35,114.5**	**100.0%**

ECONOMIC IMPACT	Total Impact	Share
Direct effects of agricultural production	$2,858,124,930	60.6%
Economic impact due to inputs to agricultural production (indirect effects)	756,620,698	16.0%
Impacts due to increased employee income and consumption (induced effects)	1,100,246,086	23.3%
TOTAL EFFECT	**$4,714,991,715**	**100.0%**

SOURCE: IMPLAN Pro and this analysis

"Induced effect" economic activity is associated with the new spending power that individuals and firms have as a result of their participation in the production of the crops and its successor activities. It reflects the things that individuals and firms buy in the economy as the result of their wages and earnings. As people work in the sector and earn wages, they go out and buy food, clothes, cars, etc. These purchases then create economic demand for these products which in turn creates more jobs and economic activity in other sectors. As a result of the jobs created directly and indirectly through the Westlands Water Districts and its customers, almost $1.1 billion in new economic activity and 6,800 additional jobs are created.

Figure 25 shows this economic activity separated across the three tasks delineated above (growing crops, subsequent food production,[7] and Westlands' spending).

Figure 25—Overall Economic Impact of the Westlands Water District, By Activity Category, 2019

EMPLOYMENT	Jobs Created	Share
Crop Production	16,424.1	46.8%
Secondary Agricultural Production	17,711.3	50.4%
Westlands Operational Activity	979.2	2.8%
Total Effect	**35,114.5**	**100.0%**

ECONOMIC IMPACT	Total Impact	Share
Crop Production	$3,172,012,510	67.3%
Secondary Agricultural Production	1,416,214,229	30.0%
Westlands Operational Activity	126,764,976	2.7%
Total Effect	**$4,714,991,715**	**100.0%**

SOURCE: IMPLAN Pro and this analysis.

As this analysis shows, while the primary economic impact on total output of the Westlands Water District is through the direct production of crops, its employment impacts are concentrated in the secondary agricultural production dimension—in the packing, handling, processing, and subsequent manufacturing of food products derived from the agricultural products of farms in the District. There are two important implications of this result. First, as Figure 22 shows, none of these jobs will exist if the crop production does not happen—there must be tomatoes to process if you are a tomato processor. Second, many of these jobs may occur well beyond the physical boundaries of the Westlands Water District. One of the challenges of modelling a relatively small and sparsely populated geographic area like Westlands is that much of the subsequent economic activity, especially the Secondary Agricultural Production, will likely occur at regional processing facilities that may be located in nearby towns, or perhaps even in distant

[7] Subsequent food production (also called "Secondary Agricultural Production") was difficult to model due to the large variety of crops produced in WWD and the limited literature on value added in each. Our literature review focused on two of the largest contributors to the agricultural output of the region—almonds and processed tomatoes—for which there is some detailed literature available. Sensitivity analyses were performed that showed the results presented here to be robust under a range of assumptions.

locations. For example, tomatoes and garlic grown in the region are often processed outside the boundaries of Fresno County in Modesto.

ESTIMATING THE IMPACT OF THE DROUGHT ON THE WESTLANDS WATER DISTRICT'S CONTRIBUTION TO THE ECONOMY

As a major water provider and the largest agricultural water district in the nation, the recent, prolonged drought has had a significant impact on the District's ability to deliver water, and the ability of its growers to fully contribute to the economy. This has been driven by the decision by the state and federal governments for regulatory reasons to limit the share of the overall water allocation that the District receives. As a result, the level of water received by the District, and hence available to provide to their customers for farming purposes, has fluctuated dramatically over the past two decades.

ESTIMATING THE ECONOMIC IMPACT OF FALLOWING PRIME FARMLAND

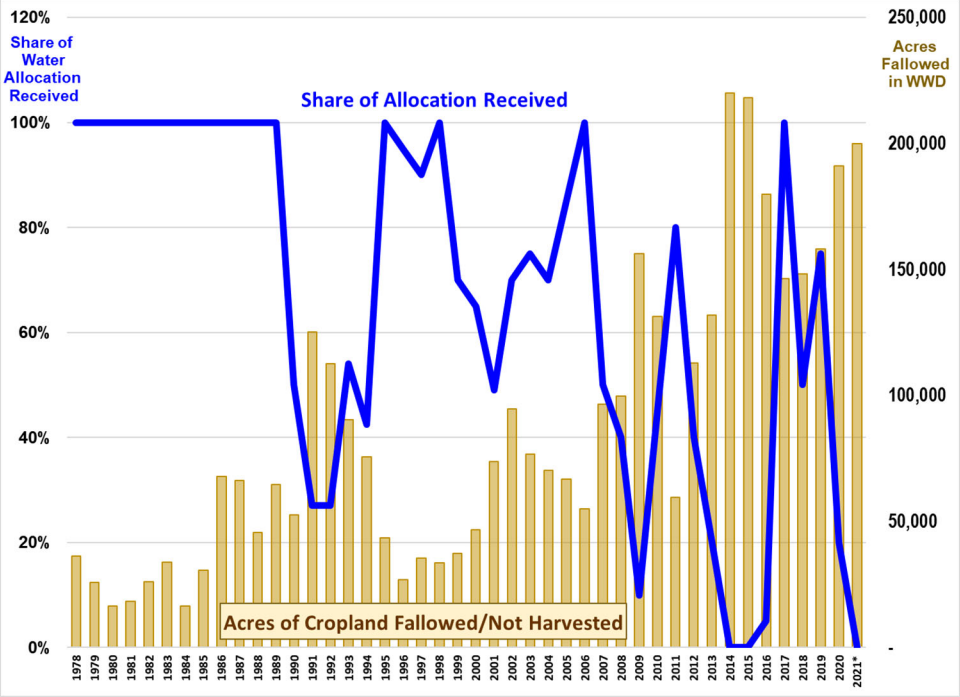
In years of restricted deliveries of surface water through the CVP, the reduced supply not only affects the volume of water available to the District's customers, but also impacts the availability of water in the region overall—making it more difficult to secure additional water from other sources. Both of these factors increase the cost of water to farmers as they either have to purchase more expensive water from other sources or pay to pump groundwater.[8] Consequently, farmers are more likely to fallow ground during years when the District receives a lower share of its allocation, as seen in Figure 26.

There is a direct and inverse relationship between the share of the water allocation received by Westlands and the level of acreage fallowed by farmers within the District. Because of the volatility in the CVP allocation as depicted by the blue line, and its persistence at extremely low levels over the past two decades, Westlands Water District farmers have become global leaders in water-efficient farming. Driving through the Central Valley, it is a sure sign that you have passed out of the Westlands Water District when you

[8] Groundwater also has more salinity issues involved which can be detrimental to crop health and yields.

spot flood irrigation. All water delivered for irrigation within Westlands is distributed through buried pipes and more than 95 percent of farmers' irrigation is typically through drip or concentrated delivery systems.

Figure 26—Share of Water Allocation Received and Acres Fallowed/Not Harvested, Westlands Water District, FYE 1979 through 2021



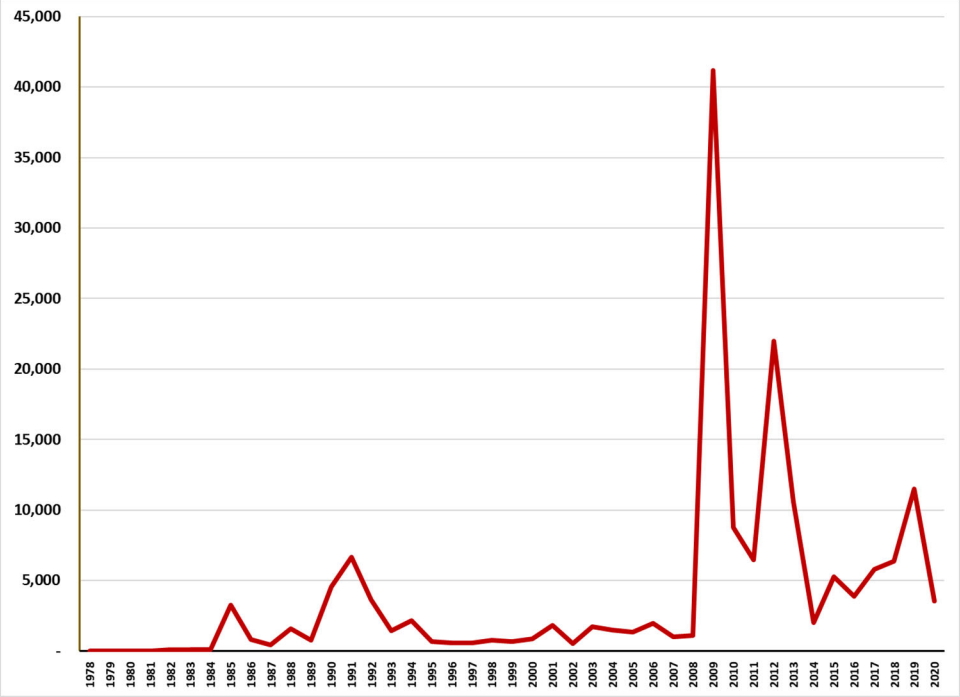
SOURCE: Westlands Water District data.

The brown columns in Figure 26 represent acres of otherwise potentially agriculturally productive land each year that is lost to fallowing. In recent years, another trend has risen into greater prominence—planting a crop and then choosing not to harvest it. In the recent drought years, when water supplies have been unreliable, this lost harvest has skyrocketed, as shown in Figure 27.

These trends are of particular concern because, not only do they represent lost revenues and value added for the local economy, but they also add additional financial pressure on local farmers because they incur many of the costs of soil preparation and planting and cultivation (including the application of scarce water resources) and then receive no or limited revenues

as a result of that investment.[9] Consequently, this is done only as a last resort when the net costs of sustaining and eventually harvesting the crop exceed the expected revenues from selling it in the marketplace.

Figure 27—Acreage Planted but Not Harvested, Westlands Water District, 1978-2020



SOURCE: Westlands Water District data.

To provide insight into the overall impact of the unavailability of water to the District, a simple calculation was done wherein the level of croplands fallowed by farmers was reduced from its current level to the level they fallowed in FY 2011-12 when the District received 80 percent of its water allocation. To minimize crop composition effects, the tree nut and grapevine acreage planted was held constant at current levels and the new acreage was allocated to other categories of crops.[10] Figure 28 shows the results of that analysis.

[9] Insurance payouts may compensate these farmers for some of these lost revenues. Additionally, farmers sometimes use these cycles to push out older trees or vines.

[10] This was done to be conservative about the estimated crop value. It is likely that farmers would, given the spotty recent history of water supplies, invest in more acres of tree nuts and grapevine if given access to additional water. These investments would in turn produce a

Figure 28—Economic Impacts of Fallowed Acreage in Westlands Water District, FY 2019

EMPLOYMENT	Current Jobs	Jobs with Restored Production	Percentage Lost to Fallowing
Direct Effect	25,239.9	30,830.7	-18.1%
Indirect Effect	6,315.5	7,783.1	-18.9%
Induced Effect	6,869.9	8,349.6	-17.7%
Total Effect	**38,425.4**	**46,963.4**	**-18.2%**

ECONOMIC IMPACT	Current Total Output	Total Output with Restored Production	Percentage Lost to Fallowing
Direct Effect	2,858,124,930	3,497,931,831	-18.3%
Indirect Effect	756,620,698	947,121,759	-20.1%
Induced Effect	1,100,246,086	1,337,225,661	-17.7%
Total Effect	**4,714,991,715**	**5,782,279,250**	**-18.5%**

SOURCE: IMPLAN Pro and this analysis

As Figure 28 shows, the overall impact of this fallowing is significant—causing an 18 percent decline in both overall output and jobs available—a loss of more than 8,000 jobs and nearly a billion dollars in overall economic output.

UNDERSTANDING THE IMPLICATIONS OF THE CHANGING CROP COMPOSITION ON THE DISTRICT'S ECONOMIC IMPACT

Despite significant investments in innovations and investments to minimize unnecessary water loss within the District, water availability has reshaped he way that crops are farmed and the types of crops that are farmed. Over time, the types of crops farmers raise within the Westlands Water District have changed, switching from more water and labor intensive crops like grasses, cotton, and beans to higher-margin crops like almonds, pistachios, and wine grapes. This transition has been accelerated and amplified by the recent drought as shown in in Figure 29.

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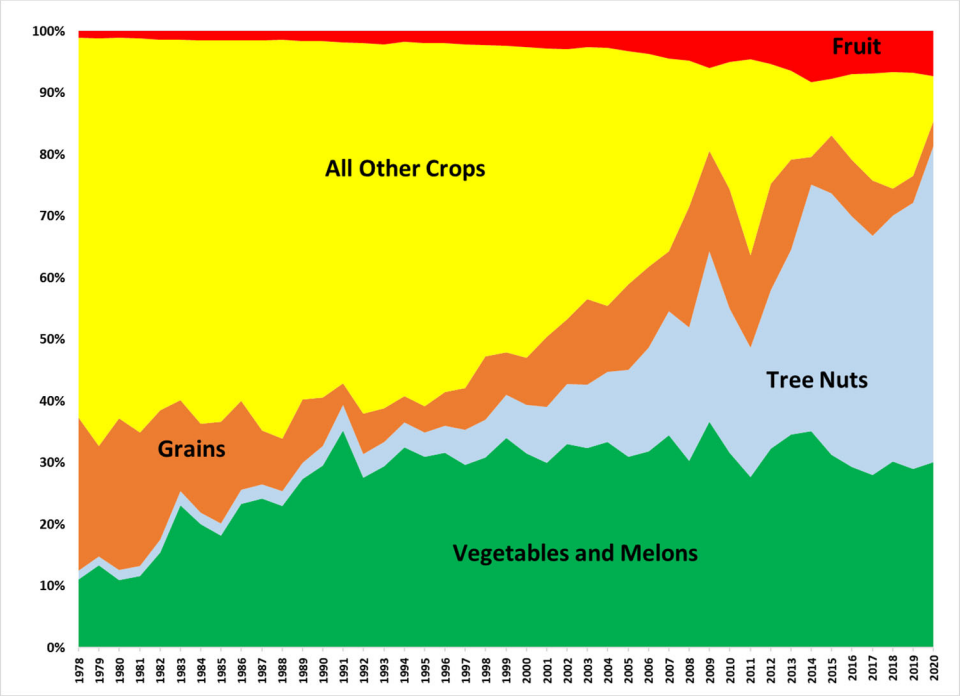
larger total output because of the higher overall margins associated with these crops but a mixed to minor negative impact on the levels of employment induced.

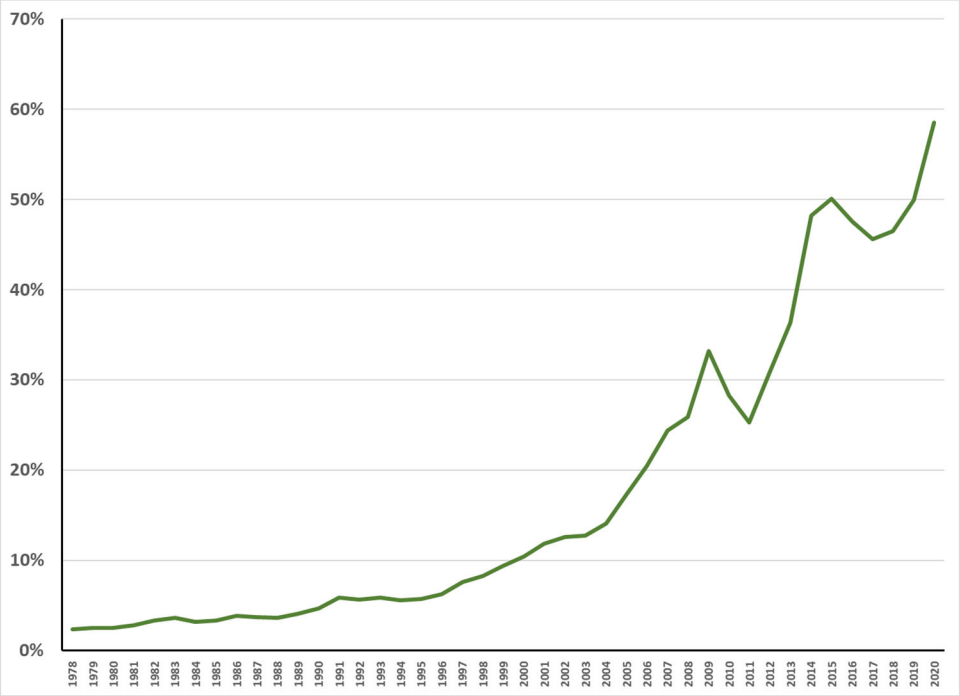
Figure 29—Agricultural Acreage Planted in Westlands Water District, by Category, FYE 1979 through 2020



SOURCE: Westlands Water District data.

Vegetables and melons have continued to remain relatively constant in recent years, while selected fruit and tree nuts have generally increased. It is worth noting that in higher water years (such as 2011 and 2017), the overall acreage of permanent crops remains relatively constant but the percentage may shrink as fallowed acres are placed back into production—usually through an expansion of the acreage growing "grains" and "other crops." which include grasses and cotton. This is seen in in Figure 29 as a larger yellow "spike" reflecting the higher share of acreage planted with All Other Crops, and a narrowing of the "gray" area reflecting acres planted with Tree Nuts. This has had two impacts—the first has been to reduce the flexibility of the farmers to respond to changes in global demand for crops and products. Tree nuts and wine grapes are long-term investments that require several years of lead time to get into production and, once producing, are relatively expensive to clear. That makes them a long-term commitment by farmers and any acreage committed to them is committed for the long term. Figure 30 shows the rising importance of these permanent crops to the Westlands growing area. This makes it more difficult for farmers to shift production in response to changing market demand, or even the availability of more water. The elevated availability of fallowed land can offset this inflexibility a bit, but it is a long-term issue for the region's economy.

Figure 30—Share of Planted Acreage with Permanent Crops, Westlands Water District, 1978-2020



NOTES AND SOURCE: Crops included here as permanent crops include tree nut crops, grapes, and fruit trees. Westlands Water District data.

The second implication of this shifting portfolio of agricultural production within the District has to do with displacing local temporary workforces. Many of the displaced crops require significant interactions with workers as they are planted, weeded, cared for, and harvested. Crops like lettuce and tomatoes, for example, require a temporary workforce. Additionally, many of these crops have shorter growing seasons and, for some of them, multiple crops can be planted, grown, and harvested on a piece of land in a single growing season. Tree nuts have modestly high labor needs up front and then require less manpower over the life of the production. As a result, shifting from labor-intensive production to less labor-intensive production for the same acreage should produce a reduced demand for agricultural labor which means we would expect to see fewer jobs under the "direct effects" listed in Figures 24 and 25. At the same time, if the crops produce much higher yields in terms of value added (part of why farmers are turning to these crops during the drought), these direct job losses may be offset in part by slightly higher "induced effects" and (if inputs are more expensive) "indirect effects."

THE IMPORTANCE OF WESTLANDS WATER DISTRICT'S CONTRIBUTION TO THE SUPPLY OF FRESH NUTS, FRUIT AND VEGETABLES

Westlands irrigated agriculture is a significant contributor to both the regional and national economies. Crops produced within Westlands' boundaries produced an estimated 28.1 percent of the crop-related agricultural production in Fresno County in 2019 (up from 23.4 percent in the prior study) and 13.1 percent of the crop-related agricultural production in Kings County in 2019 as shown in Figure 31 (up from 7.0 percent). Given that Fresno County ranked first in the state in 2019 for overall agricultural production and Kings County ranked eighth, this is a significant contribution. Figure 31 shows the overall shares of county, state and national crop production produced by farmers who are part of the Westlands Water District.

Farms in Westlands contribute almost 23 percent of fruit and nut production in Fresno County, and almost half of the vegetable and melon produced in the county. Similarly, for Kings County, the limited acreage that falls within Westlands Water District accounts for 13.4 percent of Kings County fruit and nut crops, and more than 36.3 percent of the vegetable and melon crops. Nationally, farms in Westlands provide 3.5 percent of the national production of fresh fruit and nuts and 5.4 percent of the national production of vegetables and melons—an impressive total given the small scale of the District relative to the total arable land in the United States. This 5.4 percent compares to 3.1 percent in the 2014 study, reflecting the fact that when the District receives more of its surface allocation (75 percent in 2019 versus 0 percent in 2014), it is able to contribute more to the national output in these healthy crops.

The overall importance of the impact that farms in Westlands Water District have on the national production of these key agricultural products is a testament to the unique character of this farming region and its ability to provide fresh fruits and vegetables to the nation year-round.

Figure 31—Westlands Water District Overall Share of Fresh Fruit and Vegetable Crops, Estimated Crop Values by Category, 2019
(thousands of dollars)

	Westlands Water District	Fresno County	Kings County	California	United States
Fruit and Nut Crops	1,009,528	4,246,673	644,224	21,419,425	29,026,988
Vegetables and Melons	768,193	1,429,003	180,649	8,237,276	14,157,279
All other	169,171	394,555	479,059	7,723,771	NA
Total	**$1,946,893**	**$6,070,231**	**$1,303,932**	**$37,380,472**	**NA**

Westlands Water District – Share of Overall Output

Fruit and Nuts Crops	22.9%	13.4% [a]	4.7%	3.5%
Vegetables and Melons	44.7% [a]	36.3% [a]	9.3%	5.4%
All Other	24.1% [a]	3.8% [a]	2.2%	
Total	**28.1% [a]**	**13.1% [a]**	**5.2%**	

SOURCE: Westlands Water District data; Fresno County Department of Agriculture, *2019 Fresno County Annual Crop & Livestock Report*; Kings County Department of Agriculture/Measurement Standards, *Kings County Agricultural Crop Report 2019*; California Department of Food and Agriculture, *California Agricultural Statistics Review 2020-21*; United States Department of Agriculture, *Agricultural Statistics 2020, Fruit and Tree Nut Yearbook*.

[a]-includes only the share of production of farms within the Westlands Water District that are within each respective county-imputed from 2019 data.

California's growing regions are the nation's primary source of fresh fruit, nuts, and vegetables as shown in Figure 32. California growers account for well over half the total U.S. production of nearly every category of fresh fruit and vegetables consumed in the United States—accounting for more than 85 percent of the production for 23 crops and more than 45 percent of the U.S. production of 36 crops.

Figure 32—Crops for Which California Is the Leading US, 2019

Crops for Which California Produces More than 99 Percent of US Total
Almonds, Artichoke, Celery, Dates, Figs, Garlic, Grapes (Raisins), Honeydew Melons, Kiwifruit, Nectarines, Olives, Peaches (Clingstone), Pistachios, Plums, Prunes, Sweet Rice, Ladino Clover Seed, Walnuts
Crops for Which California Produces More than Any Other State
Apricots, Asparagus, Avocados, Dry Lima Beans, Broccoli, Brussel Sprouts, Fresh Cabbage, Fresh Carrots, Carrots (Processing), Cauliflower, Corn (Sweet), Cotton (American Pima), Daikon, Dates, Eggplant, Escarole/Endive, Flowers (Bulb and Cut), Grapes (Table and Wine), Alfalfa Hay, Jojoba, Kale, Kumquats, Lemons, Lettuce (Head, Leaf, and Romaine), Limes, Mandarins, Melons (Cantaloupe), Onions (Dry and Green), Parsley, Peaches (Freestone), Chili Peppers, Bell Peppers, Persimmons, Pluots, Pomegranates, Raspberries, Safflower, Fresh Spinach, Strawberries, Processing Tomatoes, Greenhouse Vegetables, Watercress

SOURCE: California Department of Food and Agriculture, *California Agricultural Statistics Review2014-15;* United States Department of Agriculture, *Agricultural Statistics 2019-2020.*

WESTLANDS WATER DISTRICT FARMERS CONTRIBUTE TO U.S. AND CALIFORNIA AGRICULTURAL EXPORTS

Agricultural exports totaled $21.7 billion for California in 2019, the most recent year for which data are available, and up 3 percent from the prior year. Figure 33 shows the exports for the top 15 products for California agricultural exports.

Figure 33—Top 15 Agricultural Exports, California, 2019

Rank	Commodity	Export Value *($millions)*
1	Almonds	4,901
2	Pistachios	2,010
3	Dairy and Products	1,805
4	Wine	1,253
5	Walnuts	1,250
6	Rice	765
7	Table Grapes	743
8	Processed Tomatoes	623
9	Oranges and Products	541
10	Cotton	438
11	Beef and Products	404
12	Strawberries	402
13	Hay	339
14	Seeds for Sowing	333
15	Lettuce	292

SOURCE: California Department of Food and Agriculture, *California Agricultural Exports, 2019-2020.*

Of these fifteen commodities, growers in the Westlands Water District contribute significantly to the state's supply of nine of these commodities, including almonds, wine (by providing wine grapes), pistachios, table grapes, processed tomatoes, raisins, cotton, lettuce, and seeds for sowing. Additionally, hay, grain, and feed production from farms within the District contribute to two others—dairy and beef products.

REPLACING LOST AGRICULTURAL PRODUCTION INTRODUCES NEW POLICY CHALLENGES

Many of the critical points raised in the 2015 analysis about the importance of agricultural production to the Central Valley region and the state remain today. The economic ladder of opportunity continues to be critical for providing opportunity to the state's agricultural workers. The region's geography, climate, soil, economy, and regulatory environments continue to represent the premier place in the United States where agricultural can be successful on this scale, even as changes in the climate impact it. California's unique location on the Pacific Rim and the relative proximity of ocean transportation continue to contribute to its comparative advantages for trade.

Additionally, the major reasons discussed in the 2015 analysis continue to be important and true:

1. Reliable domestic production of key foodstuffs is essential to a robust national security strategy. Especially with the labor market supply chain disruptions around COVID-19 on the production of foodstuffs and the complexities of moving goods across international borders, it is even more critical to have a predictable and reliable food supply.
2. Domestic food production continues to be held to quality and safety higher standards than production in countries from which the U.S. imports agricultural products.
3. Domestic producers must meet stringent standards to protect the environment while foreign producers, especial in Central and South America are generally held to lower environmental standards.
4. Labor regulation in these same foreign markets is typically much more relaxed and workers often bear greater risks for significantly less pay and benefits.
5. Production outside of the United States is often less effective at stewarding the precious resources upon which agriculture depends, including water and soil quality.

UNDERSTANDING THE UNCERTAINTIES OF TODAY'S ECONOMIC INSTABILITY ON THESE ESTIMATES

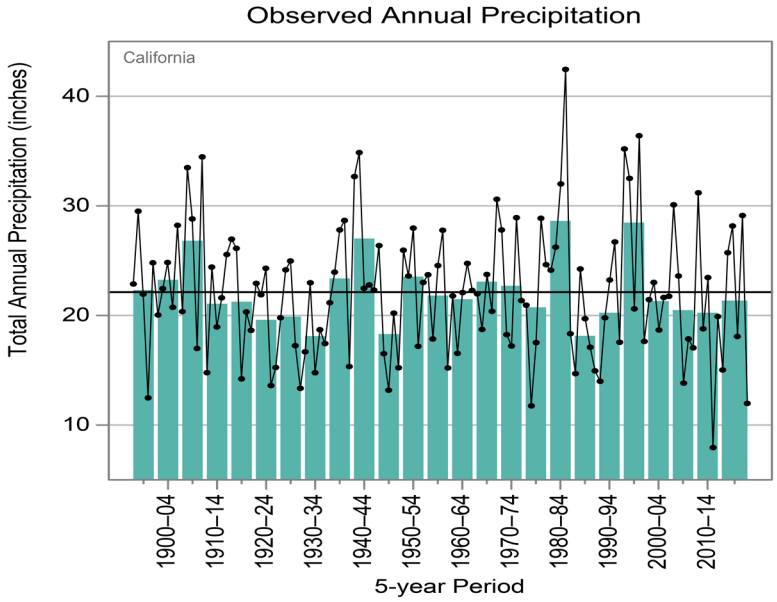
This analysis provides the best estimate possible of the economic impact of the Westlands Water District on local and national economies. This estimate is offered during a time of tremendous instability and uncertainty. There are many dimensions of the current demographic, economic, and public policy environments that could and will have significant impacts on how that impact varies in the future and, to a limited extent, how it has changed already. In this section, a few of these uncertainties will be briefly explored with a view toward describing their likely impacts on the analysis provided in this report. These areas of uncertainty include:

- Climate change and precipitation levels;
- Supply chain and support disruptions;
- Labor market shifts due to current immigration policies; and
- The COVID-19 pandemic.

CHANGING PRECIPITATION PATTERNS AND CLIMATE CHANGE

Recent political debates have centered on the question of whether recent precipitation cycles are precursors to or reflective of large, immutable shifts in the global climate. A detailed treatment of this issue, the attendant long-term climate trends, and some consideration of its potential impact on the economy of the region is presented in our 2017 report *The Implications of Agricultural Water for the Central Valley*.[11] The specific implications of disruptions to the region's water supply are addressed in that study. In the most recent history, however, there have been periodic windows of relatively normal precipitation. In the long-term, if current boom and bust periods persist in the water cycle, public policy will have to move toward creating and supporting greater storage and conservation to meet the needs of agricultural, industrial, and urban users.

Figure 34—Total Annual Precipitation, California, 1900 – 2020



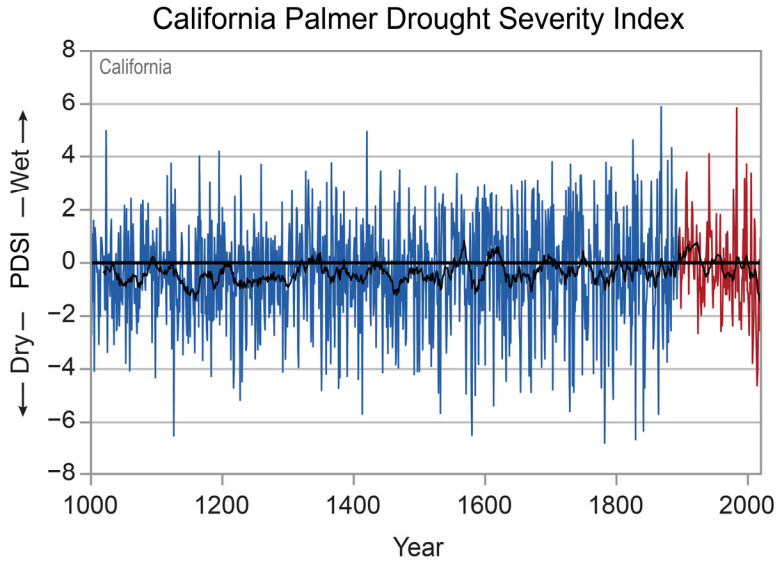
SOURCE AND NOTES: National Oceanic and Atmospheric Administration National Centers for Environmental Information, *State Climate Summaries 2022: California*. Dots show annual values. Bars show averages over five-year periods (last bar is a six-year average). Horizontal black line is the average for the entire period.

[11] Shires, Michael A. *The Implications of Agricultural Water to the Central Valley*, research report complied under contract with the Westlands Water District, September 2017, 35 pp. https://wwd.ca.gov/wp-content/uploads/2017/08/implications-of-agricultural-water.pdf.

Figure 34 provides a snapshot of the last 120 years of precipitation data for the state, reproduced from the state summary from the National Oceanic and Atmospheric Administration's National Centers for Environmental Information 2022 *State Climate Summary* for California. Within just this period is considerable volatility.

Looking at the broader and longer trend, as seen in Figure 35, the volatility is even more striking, with many periods of significant drought. To quote that analysis, "The extended record indicates periodic prolonged wet and dry periods. In the modern era, the wet period of the 1900s and the recent dry period of the 2000s are clearly evident."

Figure 35—California Palmer Drought Severity Index, 1000 – 2020



SOURCE AND NOTES: National Oceanic and Atmospheric Administration National Centers for Environmental Information, *State Climate Summaries 2022: California*. Values for 1895-2020 (red) are based on measured temperature and precipitation. Values prior to 1895 (blue) are estimated from indirect measures such as tree rings. The fluctuating black line is a running 20-year average.

Public policies around this issue, such as the Sustainable Groundwater Management Act, also have important long-term implications to the future scale of the economic profile of the Westlands Water District. The District serves as the Groundwater Sustainability Agency (GSA) for the Westside Groundwater Subbasin (the subbasin that is below the District).

As the GSA, the District has identified groundwater reductions and restrictions that will go into effect beginning in 2022. There is an eight-year

transition period during which the amount of groundwater pumped will be reduced from 1.3 acre-feet/acre in 2022 to 0.6 acre-foot/acre in 2030.[12]

The District's *Water Management Plan* incorporates the assumptions of this Act and other responses to the impacts of environmental regulations that spin out of the state's planning for the possible consequences of climate change. For purposes of this analysis, which looks at the District's current economic footprint, the impacts caused by these policy initiatives are just beginning to be seen in the crop and production profiles and choices made by its customers.

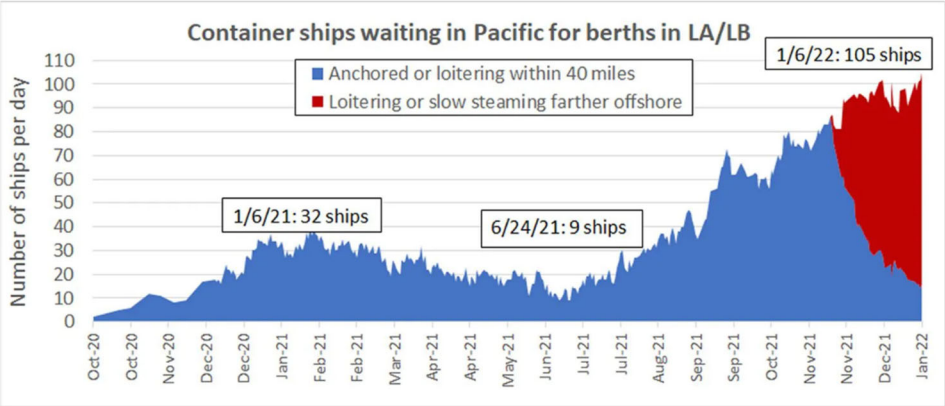
SUPPLY CHAIN AND LOGISTICAL SUPPORT DISRUPTIONS

The intersection between the COVID-19 pandemic (discussed in more detail below) and the state's regulatory environment has led to disruptions in the supply chain and logistical infrastructure that could eventually affect the economic footprint of the Westlands Water District. Agriculture is an integral part of the nation's infrastructure and increased dependence on ships, rail, and trucks to move goods around. As these key transportation arteries have become seriously blocked during the pandemic, it has a direct impact on growers' ability to move their goods to market.

One critical dimension of this impact has been in the flow of containers through the state's ports—a key issue in both the sector's ability to move exports of agricultural products to their clients overseas and in the ability of growers to obtain needed equipment and chemicals to produce their crops. Figure 36 shows a table prepared by American Shopper showing the number of container ships waiting for berths in the Ports of Los Angeles and Long Beach.

[12] More information about these plans can be found at https://wwd.ca.gov/water-management/groundwater-management-program/sustainable-groundwater-management-act/.

Figure 36—Container Ships Waiting in Pacific for Berths in the Ports of Los Angeles and Long Beach, October 2020 – January 2022



SOURCE AND NOTES: Analysis by American Shipper based on data from the Marine Exchange of California. Miller, Greg. "New year brings new all-time high for shipping's epic traffic jam." American Shipper. January 7, 2022. https://www.freightwaves.com/news/new-year-brings-new-all-time-high-for-shippings-epic-traffic-jam.

Complicating the situation in the ports, but also more directly affecting the agricultural economy overall, is the impact that COVID-19 has had on trucking capacity across the state and nation. Some of the direct impacts on truckers have included access to rest areas and travel sites, testing requirements, and vaccine mandates (both through Occupational Safety and Health Administration and through requirements imposed on government contractors). These restrictions have unfolded in a sector that had already identified significant shortages of drivers. Even before COVID-19 arrived, the American Trucking Association identified a shortfall of 60,800 truck drivers.[13] By October of 2021, they had modified that estimate up to 80,000 drivers.[14] The imposition of vaccine mandates on large U.S. employers and federal contractors by the U.S. government likely exacerbated the situation.

[13] There has been an on-going debate about the full magnitude of this shortfall, but even critics of this estimate recognize that this was a very tight labor market prior to COVID-19. For example, a March 2019 analysis by the U.S. Bureau of Labor Statistics, in its *Monthly Labor* Review, found that the labor market was "tight" but was allowing for good movement into and out of the market. (see the U.S. Bureau of Labor Statistics. "Is the U.S. labor market for truck drivers broken?" *Monthly Labor Review*, https://www.bls.gov/opub/mlr/2019/article/is-the-us-labor-market-for-truck-drivers-broken.htm).

[14] Economics Department, American Trucking Associations, Inc. "Driver Shortage Update, 2021," October 25, 2021 press release, https://www.trucking.org/sites/default/files/2021-10/ATA%20Driver%20Shortage%20Report%202021%20Executive%20Summary.FINAL_.pdf.

Additionally, the announcement by the United States requiring vaccination by foreign visitors at the Canadian and Mexican land border crossings has also generated considerable concern about how it may reduce the flow of goods internationally.

While some of these mandates have been reversed, or are in litigation, their impact on the number of truckers is being felt. Layered on top of this shifting landscape are more permanent changes to California's regulatory and legal frameworks. Rising fuel costs and regulatory fees are taking their tools as are the disruptions caused by the state's adoption in 2020 of AB 5 which would functionally eliminate the independent owner/operator model for truckers in California. While the legislation is not binding on California trucking companies pending a final resolution by the U.S. Supreme Court, it and new air "quality" regulations, requiring electric trucks by 2045, launched a shift in the trucking landscape in the state. Between driver scarcity and rising fuel costs, the volume of cargo capacity has declined while shipping costs have risen.

The combination of port congestion and trucking limitations has affected farmers' ability to purchase herbicides, insecticides, fertilizers, and farm equipment. A January 2022 study by the Purdue Center for Commercial Agriculture[15] found that farmers had significant difficulty purchasing needed inputs from their suppliers. Some 28 percent reported difficulty in purchasing herbicides, 17 percent reported difficulty purchasing insecticides, 31 percent had difficulty purchasing fertilizers, and 24 percent had difficulty purchasing farm machinery in December of 2021.

The shipping congestion in our nation's ports, and the attendant container chaos, has also directly affected growers' ability to export their product abroad as the ability to secure space in outgoing containers is constrained. While this increases global prices, it also disproportionately affects transportation costs resulting in lower revenues for growers.

But most importantly, it creates problems for American consumers. As California growers face more obstacles—both natural and manmade—to

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[15] Mintert, James and Michael Langemeier. "Farmer Sentiment Rises on Strengthening Current Financial Position." *Ag Economy Barometer.* Purdue Center for Commercial Agriculture, January 2, 2022, https://ag.purdue.edu/commercialag/ageconomybarometer/wp-content/uploads/2022/01/December-2021-Ag-Economy-Barometer-1.pdf.

produce fresh fruits and produce, our ability to import replacement fruit and produce from abroad is hampered by the nation's supply chain bottlenecks. According to USDA estimates for the 2021 federal fiscal year, the U.S. is expected to import 12.9 million metric tons of fresh fruits and 8.9 million metric tons of fresh vegetables worth more than $26 billion.[16] It is also expected to import nearly 13 million more metric tons of processed fruit and vegetables worth more than $6.8 billion. These are significant volumes of fruit and produce with limited shelf lives that are already moving through our ports, rails, and trucking networks. Delays and delivery problems significantly increase the risks and costs of bringing these perishable goods to market.

A recent survey of grocers[17] by the National Grocers Association (NGA) pointed to the supply chain and especially trucking issues as an important cost driver and cause of empty store shelves. *The Packer*, in its coverage of this and several other NGA surveys, spoke in detail not only about the uncertainties and costs created by supply chain issues, but to its increasing vulnerability. Even as fresh fruit and produce are currently an area of relative strength vis-à-vis the supply chain (in part because of the local nature of the networks), shortages are starting to appear in some regions and the ongoing stability of the system requires a stable supply.[18]

The bottom line is that fresh fruit and produce continue to be available in the United States because farms in California, including those in Westlands, continue to provide some 80 percent of the nation's supply. Additionally, as discussed earlier in this Report, if water supplies continue to be uncertain and volatile, the acreage available to continue growing this produce will be significantly constrained. If this domestic production is curtailed, it will make

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[16] U.S. Department of Agriculture Economic Research Service. *Outlook for U.S. Agricultural Trade: February 2022*. Published February 24, 2022. https://www.ers.usda.gov/webdocs/outlooks/103379/aes-119.pdf?v=2745.6. Accessed February 27, 2022.

[17] National Grocers Association, *2021 Independent Grocers Financial Survey*, 2021. A summary and highlights can be found at https://www.nationalgrocers.org/wp-content/uploads/2021/11/FMSSurvey_Web.pdf.

[18] Kresin, Janice M. "Survey" Retailers reveal expectations on prices, supply chain issues in 2022." *The Packer,* December 14, 2021, https://www.thepacker.com/news/retail/survey-retailers-reveal-expectations-prices-supply-chain-issues-2022. Accessed February 27, 2022.

the nation dependent on foreign sources which are, in turn, much more subject to supply chain and transportation problems.

Finally, if current supply chain bottlenecks persist for too much longer, key equipment and technologies needed to grow agricultural products will begin to impact production levels. As agriculture has gotten increasingly sophisticated and farmers have incorporated innovative technologies and information systems into their business models, they have become increasingly dependent on technology to operate. Things like tractors, pumps, and drones rely on microprocessors and chips to function. The current supply chain crisis has adversely affected the national supply of these tools. Even goods manufactured domestically sit unfinished in many instances for want of a single input that is waiting to come ashore at a local port.

For perishable agricultural products, this diminished capacity coupled with higher costs represent new pressures on both profitability and the ability to deliver their agricultural products to market. Because of the imbalances in the flow of containers through West Coast ports, for example, agricultural exporters are having difficulty finding containers as foreign shippers collect them rather than allowing them to collect American loads for export.[19]

If these pressures persist in the medium term, it may force farmers to choose between harvesting crops for delivery or leaving them in the field. In the medium term, if enough production is not brought to market, it could create a whole new supply chain crisis in the markets for fresh foods and produce.

LABOR MARKET SHIFTS AND PUBLIC POLICY

Agriculture has historically employed thousands of unskilled workers. State, and now federal, policies and laws have driven up wages for these workers. Although it is more complicated for agriculture, and especially difficult in the case of fresh fruit and vegetables, it is conceivable that new technologies and methods will be developed that will be decreasingly reliant on workers and labor. Technology has supplanted labor in many sectors where it was not believed possible.

[19] American Farm Bureau, "Market Issues to Track for 2022." *Market Intel*. January 28, 2022, https://www.fb.org/market-intel/market-issues-to-track-for-2022.

Simultaneously, U.S. immigration policies have allowed for a surge of new workers who are largely unskilled. Current accounts estimate the new pool of potentially low-skilled workers in the hundreds of thousands. While this would normally drive wages downward for these workers, current minimum wage laws will likely force the competition for these low-skilled jobs into other forms and venues. To the extent these new workers relocate to the region, this could have significant impacts on the poverty and employment data listed in this study.

COVID-19 AND ITS IMPACTS ON DEMAND, LOGISTICS AND LABOR

Finally, there is the significant impact that COVID-19 has had on the economy and the workforce. While people still need to eat and thus much of the impact on demand for agricultural products has remained stable, declines in households' income due to employment disruptions has affected their ability to purchase goods—including agricultural goods. The USDA has even projected a modest increase in US agricultural exports in 2021.[20] Preliminary data showed little impact of this factor on the acreage planted in the Westlands service area in 2020, as documented in Figure 23 in this study.

At the same time, the pandemic has significantly impacted the local economy. Protecting workers from exposure and infection has been an ongoing challenge. Lost productivity due to illness, disruptions of logistics and transportation, unstable markets and prices, burgeoning inflation, dramatically escalating fuel costs, increased medical costs, and a plethora of other related impacts have increased the costs that agricultural producers face while a volatile marketplace has left them scrambling to plan and grow their products. Remember that agricultural production is measured in weeks and months while the instabilities introduced by COVID-19 and its mutating variants are measured in days and weeks.

Inflation is also another aspect of the COVID-19 economy that will impact the results presented in this analysis. These impacts will mostly be seen in data and analyses capturing economic activity in the years from 2021

[20] U.S. Department of Agriculture, "America's Farmers: Resilient throughout the COVID Pandemic," post by USDA Chief Economist Robert Johansson, July 29, 2021, accessed October 31, 2021. https://www.usda.gov/media/blog/2020/09/24/americas-farmers-resilient-throughout-covid-pandemic

onward. 2020 still saw relatively stable prices, including in the critical energy sector as reduced supplies were offset by suppressed demand.

For purposes of this analysis, however, sensitivity studies have shown that the relative impacts documented here are reasonably good estimates for the short and medium term. Labor markets and inflation are the two biggest drivers of uncertainty in this analysis and the impacts of these two variables will likely lag the pace of the current instability.

CONCLUSION

The footprint of the Westlands Water District on the Fresno region, the Central Valley, the state of California, and the nation is undeniable. Farms in Westlands are a significant supplier to the nation and the world of fresh produce and agricultural products. In the production of that supply, it directly and indirectly employs and supports tens of thousands of household and creates billions of dollars of economic value. While there are a range of modern policy and economic crises that may influence the level of that production, there are no real domestic alternatives to the region for production of these critical agricultural products.

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United States Department of the Interior

NATIONAL PARK SERVICE
WHISKEYTOWN NATIONAL RECREATION AREA
P.O. BOX 188
WHISKEYTOWN, CA 96095-0188

IN REPLY REFER TO:
1.A.2

Memorandum

To: U.S. Bureau of Reclamation, Bay-Delta Office (sha-MPR-BDO@usbr.gov)

From: Superintendent, Whiskeytown National Recreation Area

Subject: Response to the Bureau of Reclamation's Notice of Intent to Prepare an Environmental Impact Statement to Analyze Potential Modifications to the Long-Term Operation of the Central Valley Project and State Water Project

Whiskeytown National Recreation Area (NRA) was founded in 1965 after the development of the Whiskeytown Reservoir along Clear Creek as part of the Central Valley Project (CVP). The National Park Service (NPS) works to protect the lake and its surrounding watershed and to provide outdoor recreational opportunities to the public, with visitation by nearly one million people each year. Any changes to operations of the Trinity River diversion, Whiskeytown Reservoir, Clear Creek, and associated facilities have the potential to significantly impact park operations, threatened fish species, cultural resources, recreational access, visitor safety, local economies, and other important resources. We also recognize the delicate balance in managing water quality, temperatures, and flows for threatened and endangered species and to meet future water demands on the CVP.

Whiskeytown NRA requests communication and collaboration during the Bureau's development of the Environmental Impact Statement (EIS) on proposed changes to the CVP to ensure that operational, safety, and resource concerns of NPS are adequately addressed. If there are any alternatives being considered that could alter operations at the Whiskeytown Reservoir or associated facilities, creeks, and water diversions, we request that the NPS be included as a cooperating agency during the development of the EIS. With increasing drought frequency and severity and concerning climate change predictions, we understand that evaluating a range of CVP alternatives and scenarios will be necessary to ensure resource impacts are minimized.

Additionally, we request the Bureau conduct an analysis of the impacts of continued testing of the Crystal Creek Bypass on natural and cultural resources. The Bureau has implemented this bypass test twice in the last decade, and these operations have resulted in significant scouring of the downstream channels of Crystal and Willow Creeks before discharging into Clear Creek and the Whiskeytown Reservoir. Each test also resulted in adverse impacts to the Tower House Historic District, an important region of the park that is listed on the National Register of Historic Places. Whiskeytown NRA must continue to prioritize meeting our administrative objectives, including (1) public outdoor recreation benefits; (2) conservation of scenic, scientific,

historic, and other values contributing to public enjoyment; and (3) such management, utilization and disposal of renewable natural resources, as identified in our enabling legislation.

Thank you for your consideration of our comments. If you have any questions, feel free to contact Laura Shaskey, Chief of Resource Management & Interpretation (laura_shaskey@nps.gov).

cc:
Laura Shaskey (laura_shaskey@nps.gov)
Regional Environmental Coordinator, Regions 8, 9, 10 & 12
(PWR_NEPA_Compliance@nps.gov)

March 30th, 2022

TO: Bureau of Reclamation
Attention Cindy Meyer
Bay-Delta Office
801 I Street
Sacramento, CA 95814-2536 E-Mail sha-MPR-BDO@usbr.gov

RE: Supplemental Comments Regarding the Scoping of DEIS Reinitiation of Consultation on Long-Term Operations of the CVP and SWP

Dear Ms. Meyer,

The Winnemem Wintu Tribe, Save California Salmon and Friends of the River submit these supplemental scoping comments for development of alternatives and analysis for the above-referenced Draft EIS. Save California Salmon has also provided comments with Natural Resources Defense Council, Defenders of Wildlife, San Francisco Baykeeper, The Bay Institute, Golden State Salmon Association, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, and Restore the Delta. These comments are meant to supplement our other comments which we are also incorporating by reference.

Save California Salmon (SCS) is dedicated to policy change and community advocacy for Northern California's salmon and fish dependent people. The goal of the organization is to support the fisheries and water protection work of the local communities, and to advocate effective policy change for clean water, restored fisheries, and vibrant communities. SCS also supports youth and cultural action that overlaps with watershed action.

Consultation Must Occur with Federally and Non-Federally Recognized Tribes

The Notice acknowledges that the Bureau of Reclamation (BOR) will consult with only federally recognized Tribes in the project area "to request their input regarding the identification of any

properties to which they might attach religious and cultural significance to within the area of potential effect."[1] However, California is home to many more tribes that are recognized within the state but are not federally recognized.

Per California Assembly Bill 52 (AB 52) under CEQA, the BOR or CaliforniaDepartment of Water Resources must begin consultation with California Native American tribe[s] that are traditionally and culturally affiliated with the geographic area of the proposed project, if the tribe[s] requested to…be informed" by the BOR of proposed projects in the relevant geographic area. Because this the NEPA process also impacts a state water project and sacred sites to California Tribes, both recognized and unrecognized and those petitioning for recognition, AB 52 should apply to this process.

While it is useful that the BOR has acknowledged the need for tribal consultation, the scope of consultations needs to be extended to every tribe whose traditional lands will be affected by the Projects. It is troubling that only the Klamath and Trinity River Tribes are referenced in the scoping document. Tribes that have had traditional and cultural affiliation with the entire project area must be identified by the Native American Heritage Commission and then contacted by the BOR for consultation. It is important that the federal trust responsibility to tribes be honored as "[t]he purpose behind the trust is and always has been to insure[sic] the survival and welfare of Indian tribes and people. This includes an obligation to provide those services required to protect and enhance tribal lands, [and] resources[.]"[2]

Under California law, consultation is defined as "the meaningful and timely process of seeking, discussing, and considering carefully the views of others, in a manner that is cognizant of all parties' cultural values and, where feasible, seeking agreement. Consultation between government agencies and Native American tribes shall be conducted in a way that is mutually respectful of each party's sovereignty. Consultation shall also recognize the tribes' potential needs for confidentiality with respect to places that have traditional tribal cultural significance." (Cal. Gov. Code § 65352.4) This extensive consultation process must be conducted with every tribe that is identified by the Native American Heritage Commission and not just federally recognized tribes.

Tribal Beneficial Uses and Impacts to Tribal Communities and Trust Species Must Be Analyzed

[1] 87 FR 11093. (2022) "Notice of Intent To Prepare an Environmental Impact Statement and Hold Public Scoping Meetings on the 2021 Endangered Species Act Reinitiation of Section 7 Consultation on the Long-Term Operation of the Central Valley Project and State Water Project."

[2] United States. American Indian Policy Review Commission. (1977). American Indian Policy Review Commission: final report submitted to Congress May 17, 1977. P. 138. https://files.eric.ed.gov/fulltext/ED164229.pdf

The Notice states that the project area includes "the Trinity, Sacramento, American, Stanislaus, and San Joaquin rivers; and in the Sacramento-San Joaquin Delta." SCS is concerned that the BOR will not engage in meaningful government to government consultation with all the impacted Tribes within this large area. Meaningful consultation is extremely important because these Projects include impacts to cultural resources that cannot be mitigated.

As proposed, this Project will have serious impacts on water quality and fisheries. It could also substantially reduce acres of floodplains and inundated wetlands in the Northern Delta such as the Yolo Bypass. These areas are not only critical to the growth, production, and survival of Tribal trust fisheries such as salmon, trout and lamprey, they are also needed for cultural plants such as tullies and willow. These plants cannot survive or provide for Tribal people without adequate high-water events that provide floodplain and wetland inundation

The Project will definitely "affect" Tribal rights and impact Tribal trust resources. As affirmed in both federal and state law, Tribes can have both appropriative and riparian water rights.[3] Tribal water rights not being adjudicated does not mean that they do not exist, nor does the Tribe's land not being in trust mean that rights have been lost.[4]

Long before the development of modern day water rights, tribes across the state depended on river resources for food, regalia, and ceremonies. Due to no fault of their own, California's tribes' rights and access to the river and the species they once depended on, have been diminished over time. But the cultural significance of the rivers and their ecosystems have been carried on through generations and these traditions still live on today.

The California Water Quality Control Board is aware of the impacts that water quality has on Native American Tribes cultural resources and sustenance and has begun a process to identify Tribal beneficial uses as part of triennial review process in the Bay Delta and tributaries. This process is not completed however cultural and subsistence fishing, traditional gathering and ceremonial uses are likely to be designated in the Delta and tributaries and Trinity. This is a reasonably foreseeable action that will be approved by the Environmental Protection Agency (EPA) and therefore these uses should be addressed in the DEIS.

At the March 16th, 2022 State Water Board hearing on Sacramento River Temperature Management Considerations, Malissa Tayaba, the Vice Chairperson of Shingle Springs Band of

[3] In *United States v. Adair*, the 9th Circuit Court of Appeals held that "(1) the Tribe and its members have water rights sufficient to maintain their treaty rights to hunt and fish on the former reservation; (2) individual Indian landowners have water rights, subject to the paramount rights of the Tribe, sufficient to maintain agriculture on their lands" 723 F.2d 1394, 1397 (9th Cir. 1983).

[4] In *Herrera v. Wyoming*, the United States Supreme Court upheld the Crow Tribe of Indians' treaty right to hunt on unoccupied lands outside its reservation, ruling that the right survived Wyoming's statehood.

Miwok, highlighted the connection between river health and preserving cultural resources. She first mentioned the salmon, which were once abundant, and how they are a part of traditional ceremonies, regalia, medicine, and foods. Additionally, she mentioned the condition of basketweaving materials that can be found along the river. In traditional basket teachings, weavers would use their mouths to moisten the weaving materials to make them pliable. However, that is no longer possible because the plants have absorbed the toxins from the river and are no longer safe to put in their mouths and therefore have lost their traditional ways.

The BOR should take steps to (1) engage in meaningful consultation, and (2) analyze the Project impacts to Tribal trust resources.

The DEIS Should address Fish Passage at the Shasta Reservoir and Other Project Reservoirs and Analyze the Winnemem Wintu Tribes Fishways Re-introduction Proposal

The DEIS should analyze options to provide for fish passage to support the recovery of ESA listed winter run and spring run salmon. Multiple scientific studies and the Central Valley Salmonids Recovery Plan have identified habitat modification as a main limiting factor for both endangered winter run salmon and threatened spring run salmon.[5]

Winter run and spring run salmon traditionally used the upper reaches of watersheds for spawning and have the ability to access their traditional habitats due to the damming of every major tributary to the Sacramento and San Joaquin Rivers.[6] The winter run specifically used the watersheds above the Shasta dam and have lost all of their spawning habitat forcing their populations to spawn in the mainstem Sacramento River, where they are exposed to mortality from high temperatures and fish diseases.[7] The recommendation to analyze the need to provide for fish passage and re-introduction is not only based on the best available science, reintroduction was mandated by previous Biological Opinions for Central Valley and State water project operations. We also request that winter and spring operations are modified to protect and restore spring salmon.

In March 2006, the Winnemem Wintu Tribe, along with eight other Plaintiffs represented by Earthjustice, filed suit challenging the NFMS' Biological Opinion and the 2004 OCAP it

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[5] National Marine Fisheries Service. (July 2014). "Appendix B: Threats Assessment for the Evolutionarily Significant Units of Winter-run Chinook Salmon (Oncorhynchus tshawytscha) and Central Valley Spring-run Chinook Salmon (O. tshawytscha), and the Distinct Population Segment of Central Valley Steelhead (O. mykiss)," *Recovery Plan For The Evolutionarily Significant Units Of Sacramento River Winter-Run Chinook Salmon And Central Valley Spring-Run Chinook Salmon And The Distinct Population Segment Of California Central Valley Steelhead*. https://www.fisheries.noaa.gov/resource/document/recovery-plan-evolutionarily-significant-units-sacramento-river-winter-run.

[6] Id. at 2-2, 2-3, 3-5.

[7] Id. at 2-6, 2-14.

supported. In April2008, the U.S. District Court for the Eastern District of California issued its ruling in the case, *Pacific Coast Federation of Fisherman's Associations v. Gutierrez*, which invalidated portions of the 2004 BiOp and remanded it to NMFS for revision.

In 2008 USFWS, and 2009 NMFS issued a new Biological Opinions on the 2004 OCAP, and found that the water pumping operations in the Central Valley for the CVP/SWP jeopardize the continued existence of several threatened and endangered species under the jurisdiction of NMFS.[8]

Federal biologists and hydrologists concluded that current water pumping operations for the CVP and SWP should be changed to ensure survival of winter and spring run Chinook salmon, Central Valley steelhead, the southern population of North American green sturgeon and southern resident killer whales which rely on Chinook salmon runs for food.[9]

In arriving at a Reasonable and Prudent Alternative (RPA), which set forth protective measures to improve the chances of survival for designated ESUs, NMFS concluded that analysis showed that, even after all discretionary actions are taken to operate Shasta and Folsom reservoirs to reduce adverse effects of water operations on listed anadromous fish, the risk of temperature-related mortality of fish and eggs persists, especially in critically dry years.[10] This mortality can be significant at the population level. The analysis also led to the conclusion that, due to climate change, the frequency of these critically dry years will increase.[11]

NMFS concluded that it believes it is necessary for Reclamation, other fisheries agencies, and DWR, in cooperation with NMFS, to undertake a program to provide fish passage above the rim dams such as Shasta and Folsom, in order to reintroduce winter-run, spring-run, and Central Valley steelhead back into their historical habitats above the dams.[12] NMFS believes that the

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[8] National Marine Fisheries Service. (June 2009). "Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project."https://www.fisheries.noaa.gov/resource/document/biological-opinion-and-conference-opinion-long-term-operations-central-valley
US Army Corps of Engineers. "Detailed Description of Recent OCAP Biological Opinions and Delta Wetlands Fishery Resources Effect Assessment Methods and Results."https://www.spk.usace.army.mil/Portals/12/documents/regulatory/eis/190109804-eis/190109804-SDEIS/AppendixF.pdf

[9] NOAA Fisheries. (Dec. 2021) *Water Operations in the Central Valley, California.* https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/water-operations-central-valley-california

[10] NOAA Fisheries. (April 2011) Clean Version of the 2009 Reasonable and Prudent Alternative Revised to Include the 2011 Amendments. p. 100, 112. https://media.fisheries.noaa.gov/dam-migration/040711_ocap_opinion_2011_amendments.pdf

[11] National Marine Fisheries Service. (June 2009). "Biological Opinion and Conference Opinion on the Long-Term Operations of the Central Valley Project and State Water Project." https://www.fisheries.noaa.gov/resource/document/biological-opinion-and-conference-opinion-long-term-operations-central-valley

[12] NOAA Fisheries. (April 2011) "Clean Version of the 2009 Reasonable and Prudent Alternative Revised to Include the 2011 Amendments." p. 86.

high-elevation areas of suitable habitat will provide a refuge for cold water fish in the face of climate change.[13]**The DEIS Should Analyze the Impacts of Climate Change on Water Supply and Availability and Methane Releases for Project Operations**

Executive Order 13990 requires that the Federal Government must be guided by the best science.[14] The latest science shows that reservoirs significantly contribute to GHG emissions.[15] Beyond that, it is well known within the science community that Methane releases are a significant concern related to greenhouse gasses and accounts for about 20 percent of global emissions.[16]

We request the BOR addresses impacts of GHG emissions from reservoir releases and the numerous recent studies analyzing reservoir emissions[17] and federal and state regulations and guidance of the issue of GHGs and making changes to operations to reduce methane emissions.

Trinity River Alternative

Save California Salmon is presenting an alternative to you that would protect listed coho salmon, spring Chinook salmon and would restore and fully protect Tribal Trust assets such as fall Chinook, sturgeon, lamprey and sturgeon in the Trinity River and Lower Klamath River. This letter includes both the legal justification for the alternative as well as the specifics of the proposed "Trinity River Protection Alternative" that would require Reclamation through terms and conditions in the NMFS Biological Opinion as well as amendment of Reclamation's Trinity River state water permits to current instream flows, North Coast Basin Plan temperature objectives and Trinity Reservoir cold water carryover storage.

Consistency with Existing Laws

The unique protection afforded the Trinity River, its fisheries and water is embodied in State and federal law. The special legal status of the Trinity River, and the federal mandate to do no harm to its salmon runs, has been expressed in numerous legal opinions, court decisions and administrative actions at both the State and federal level. While the Trinity River Division is "fully integrated" with the CVP, its special status creates a priority for the use of Trinity River water for Trinity River fisheries and other in-basin uses that is legally superior to any other use of CVP water outside of the Trinity River basin.

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[13] *Id.* at 87.

[14] Exec. Order No. 13990, 86 FR 7037. (2021) "Protecting Public Health and the Environment and Restoring Science To Tackle the Climate Crisis."

[15] John A. Harrison et al., "Year-2020 Global Distribution and Pathways of Reservoir Methane and Carbon Dioxide Emissions According to the Greenhouse Gas from Reservoirs (G-Res) Model," *Global Biogeochemical Cycles* no. 6, e2020GB006888 (2021).

[16] EPA, "Importance of Methane," 2021, https://www.epa.gov/gmi/importance-methane.

[17] Bridget R. Demmer, "Greenhouse Gas Emissions from Reservoir Water Surfaces: A New Global Synthesis," n.d.

The proposed alternative is consistent with federal and state mandates to protect, preserve, propagate, and restore the Trinity River's fisheries as described below.

Federal Laws and Policies:

The *Trinity River Act of 1955* (PL 84-386) "directed and authorized" the Secretary of Interior to "preserve and propagate" the fish and wildlife resources of the Trinity River.

Another provision in the *Trinity River Act of 1955* reserved 50,000 acre-feet for Humboldt County and downstream water users that is embodied in a 1959 water contract between the Humboldt County Board of Supervisors and the Bureau of Reclamation that is separate from fishery flows. A 2014 Solicitor's Opinion has reaffirmed this long- standing water right and the fact that it is in addition to fishery flows under the Trinity River Record of Decision.[18] This fact of law was recently upheld by the Ninth Circuit Court of Appeals in a case that PCFFA intervened on behalf of the federal government.[19]

The Trinity River Basin Fish and Wildlife Restoration Act of 1984 (PL 98-541) clarified the "preserve and propagate" language from the 1955 Trinity River Act to mean "…restoring fish and wildlife populations in the Trinity River basin to a level approximating that existed immediately before the construction of the Trinity River division."

Under the Tribal Trust Doctrine, and the federally reserved fishing rights of the Hoopa Valley and Yurok Tribes there is a property right associated with the flows of the Trinity River. These rights date back 10,000 years or time immemorial, making them senior to any water rights obtained by the Bureau of Reclamation for the Central Valley Project.

The Central Valley Project Improvement Act, P.L. 102-575 (CVPIA) acknowledged the difference between the Trinity River and Central Valley streams by having separate fishery restoration goals for each basin.

The primacy of the waters of the Trinity River for use in the Trinity River basin is explained in a 1979 opinion by Interior Solicitor by Leo Krulitz on the water contract and drought shortage provisions with the Grasslands Water District:[20]

"…in authorizing the Trinity River Division in 1955, Congress specifically provided

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[18] "Trinity River Division's 50,000 Acre-Foot Proviso and the 1959 Contract Between the Bureau of Reclamation and Humboldt County", U.S. Department of Interior Solicitor Opinion M-37030, Hilary C. Tompkins, December 23, 2014. Accessed at https://www.doi.gov/sites/doi.opengov.ibmcloud.com/files/uploads/M-37030.pdf

[19] San Luis Delta Mendota Water Authority and Westlands Water District v. Department of Interior (No 14-17493, D.C. No. 1:13-cv-01232-LJO-GSA), February 21, 2017.

[20] Interior Solicitor to Assistant Secretary for land and Water Resources regarding Proposed Contract with Grasslands Water District, December 7, 1979. Accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_96.pdf

that in-basin flows (in excess of a statutorily prescribed minimum) determined by the Secretary to meet in-basin needs take precedence over needs to be served by out of basin diversions."

The Federal Clean Water Act Section 303 approval by the United States Environmental Protection Agency of Trinity River Water Quality Objectives in 1992[21] constituted establishment of a federal water quality standard that all federal agencies, including the Bureau of Reclamation must comply with. USEPA also stated in their approval that Trinity River diversions to the Sacramento River are a controllable factor in the protection of the Trinity River and have harmed the Trinity River.

The 2000 Trinity River Record of Decision (ROD page 17)[22] clearly stated as follows:

"*From the inception of the TRD, Congress directed this Department to ensure the preservation and continued propagation of the Trinity River's fishery resources and to divert to the Central Valley only those waters surplus to the needs of the Trinity Basin.*"

State Laws and Policies:

The Trinity River's fisheries also have protections under the concept of the Public Trust Doctrine, as expressed in the Mono Lake Opinion (*National Audubon Society vs. Alpine County Superior Court*). "*The public trust…is an affirmation of the duty of the state to protect the people's common heritage of streams, lakes, marshlands and tidelands…."* – Supreme Court of California, 1983.

The Area of Origin and Watershed Protection Statutes under California law also contain a priority for in-basin uses compared to out of basin uses.The waters of the Trinity River are subject to California's Watershed Protection, Area of Origin and County of Origin Statutes (California Water Code Sections 10505, 11128 and 11460 *et seq.)* that limit the export of its waters to surplus flows only. Water Code Section 11128 specifically applies the watershed protection and county of origin statutes to the Bureau of Reclamation's Central Valley Project, which includes the Trinity River Division of the CVP.

The California Department of Fish and Game (DFG), in its 22 June 2004 comments on the Supplemental EIS/EIR for the Trinity River Mainstem Fishery Restoration Program[23] stated that impacts to listed species in the Central Valley and Delta because of increased Trinity River flows (and decreased Trinity exports to the Sacramento River) are not a "significant impact" requiring

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[21] Letter from USEPA Region IX Administrator to Chairman of the California State Water Resources Control Board, March 13, 1992. Accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_97.pdf

[22] See https://www.fws.gov/arcata/fisheries/reports/technical/Trinity_ROD.pdf

[23] Trinity Supplemental EIS/EIR comments from California Department of Fish and Game Region 1 Manager to Russell Smith, USBR and Tom Stokely, Trinity County. Accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_101.pdf

mitigation under the California Environmental

Quality Act. DFG cited California's watershed protection and area of origin statutes as the rationale for the determination that the priority for Trinity River water is within that basin:

"In California, the controls put in place governing a single source of water supply from two separate basins, requires needs for beneficial uses in the basin of origin be met first- then needs can be supplied for the other basin."

The North Coast Regional Water Quality Control Board and the California State Water Resources Control Board approved Trinity River temperature objectives in 1991, which were approved by USEPA in 1992.[24]

The concept of doing no harm to the Trinity River is also manifested in Water Right Order 90-05 (WRO 90-05)[8], which contained a term and condition prohibiting harm to the Trinity River as it relates to the export of Trinity River water to the Sacramento River for temperature control on the Sacramento River.

Need for Trinity River Protection Alternative

There is no assurance that the Trinity River and its beneficial uses will be protected from CVP operations because Reclamation's eight Trinity River water permits are not consistent with North Coast Basin Plan temperature objectives and instream flows under the Trinity ROD. Furthermore, the 600,000 acre foot Trinity Reservoir minimum cold water carryover storage requirement in the 2000 NMFS Biological for the Trinity River[9] is inadequate to prevent temperature induced mortality in the Trinity River, particularly during multi-year drought.

The CVP OCAP does nothing to mitigate or prevent catastrophic loss of cold-water storage and basic flows to keep fish in good condition below Trinity and Lewiston Dams, as required by the federal government's Tribal Trust obligations and California Fish and Game Code Section 5937.

Multi-year drought increases the risk to the Trinity and Lower Klamath rivers of losing the cold water stored in Trinity Reservoir to out of basin export. It is essential to note that Trinity River water provides beneficial uses for Coho (listed as threatened) and Chinook salmon, as well as

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[24] "Water Quality Control Plan for the North Coast Region" Footnote 5, Table 3-1, page 3-8.00: Accessed at http://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/083105-bp/04_water_quality_objectives.pdf

Daily Average Not to Exceed	Period	River Reach
60°F	July 1- Sept 15	Lewiston to Douglas City Bridge
56°F	Sept 15-Oct 1	Lewiston to Douglas City Bridge
56°F	Oct 1- Dec 31	Lewiston to North Fork Confluence

[8] See Water Right Order 90-05, pages 61-62. Accessed at https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/1990/wro90-05.pdf

[9] See https://www.fws.gov/arcata/fisheries/reports/technical/TREIS_BO_NMFS.pdf

steelhead, Pacific Lamprey, green sturgeon, and other species important to Tribal, recreational, and commercial fishing communities.

In 1958, the Bureau of Reclamation, pursuant to section 8 of the 1902 Reclamation Act applied to the state for water rights to operate the TRD, but those water rights contain minimum fishery flows of only 120,500 AF. Trinity ROD flows and Humboldt County's 50,000 AF water contract amount to a weighted annual average of 644,000 AF.

Reclamation has admitted that it does not operate to any specific Trinity Reservoir carryover storage requirement and does not consider water quality objectives[25] contained in the North Coast Basin Plan as water permit terms and conditions.

Trinity River temperature objectives to protect salmon and steelhead adopted by the North Coast Regional Water Quality Control Board, the State Water Resources Control Board and USEPA have not been fully incorporated into water permit requirements for the Bureau of Reclamation, creating a regulatory gap.

Reclamation does consider Water Right Order 90-05 (WRO 90-05) to be a permit term and condition, but it is not consistent with North Coast Basin Plan Temperature objectives for the Trinity River. WRO 90-05 includes Trinity River North Coast Basin Plan temperature requirements for the September 15- December 31 period but omits the Basin Plan temperature objective for the Trinity River July 1- September 15 period. Additionally, the WRO 90-05 September 15 through December temperature requirement only applies to transfers of Trinity River water to the Sacramento River for temperature control. All other uses of Trinity River water sent to the Sacramento River are not covered by the temperature requirements of WRO 90-05. Reclamation refuses to acknowledge that North Coast Basin Plan requirements are Clean Water Act Section 313 standards that they must comply with because they are not water permit terms and conditions. Thus, comprehensive Trinity River Basin Plan temperature objectives should be included in Reclamation's water permits.

The NMFS 2000 Biological Opinion[26] for the Trinity River, includes a minimum carryover storage in Trinity Reservoir on September 30 of 600,000 AF and requires reconsultation if storage falls below that level, which it did in 2014. However, other analyses have found that a 600,000 AF minimum carryover storage is inadequate. A 2012 report by Reclamation found that September 30 carryover storage of less than 750,000 AF is "problematic" in meeting state and federal Trinity River temperature objectives protective of the fishery.[27]

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[25] See 2/23/11 letter from Paul Fujitani, Chief of CVP Ops to Brian Person, Chairman Trinity Management Council. accessed at: https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_114.pdf

[26] National Marine Fisheries Service (2000), Biological Opinion for the Trinity River Record of Decision, accessed at: http://www.fws.gov/arcata/fisheries/reports/technical/TREIS_BO_NMFS.pdf

[27] See Bender MD (2012) Trinity Reservoir Carryover Storage Cold Water Pool Sensitivity Analysis. Technical Memorandum No. 86-68220-12-06, U.S. Bureau of Reclamation, Technical Service Center, Denver, CO. Accessed at http://odp.trrp.net/Data/Documents/Details.aspx?document=1813

In 1992 Balance Hydrologics found that a minimum carryover storage of 900,000 AF was necessary to meet Basin Plan temperature objectives.[28]

Analyses completed for Trinity County for the Trinity Record of Decision by Kamman Hydrologics indicated that September 30 Trinity Reservoir carryover storage of at least 1.2 million AF on September 30 is necessary at the beginning of a simulated 1928-1934 drought to meet Basin Plan temperature objectives.[29] During the recent drought, Trinity Reservoir storage fell below levels necessary to survive a historic multi-year drought such as 1928-1934.

Furthermore, Reclamation's Mid-Pacific office also produced a preliminary technical memorandum on the problem of excessive heating of Trinity Dam releases[30] when they pass through the shallow 7-mile-long Lewiston Reservoir. While Trinity Dam releases are normally 43-44°F, summer heating in Lewiston Reservoir can be severe unless approximately 1,200- 1,800 cfs is being released from Trinity Dam. Given that Trinity River summer base flows are only 450 cfs, water must be diverted to the Sacramento River to keep the Trinity River cold enough to meet Basin Plan temperature objectives. However, during severe drought or under certain operational circumstances, there may not be adequate water to provide base fishery flows and to divert water to the Sacramento River to keep the Trinity River cold. Several structural solutions have been identified in Reclamation's preliminary technical memorandum; however, a full feasibility study and environmental document would need to be prepared to select a solution and no such plans exist at this time.

Additionally, the delivery of CVP water to Sacramento River Settlement Contractors who are post-1914 diverters when other post-1914 diverters are enjoined from diversions through state curtailment orders unlawfully depletes storage in Trinity Reservoir and deprives the Trinity River basin area of origin from needed cold water, while also bypassing the priority of water rights in the Sacramento Valley.

Furthermore, during summer and fall, Trinity River diversions to the Sacramento River are often warmer than Shasta Dam releases by three degrees F or more. Diversion of large amounts of Trinity River water to the Sacramento harms Sacramento River salmon through warming and depletes Trinity Reservoir of cold water.

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[28] See Balance Hydrologics (6/26/1992) "The Need for Standards for Minimum Carryover Storage in Trinity Reservoir" Accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_116.pdf

[29] Memorandum from Greg Kamman to Tom Stokely and Mike Deas on Carryover Storage Analysis Simulated (1928-34) Period, 5/22/1998. Accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&IGFR/part2/pcffa_117.pdf

[30] See USBR (2012) Lewiston Temperature Management Intermediate Technical Memorandum, Lewiston Reservoir, Trinity County, California. Report by U. S. Bureau of Reclamation, Mid-Pacific Region, Sacramento, CA. accessed at http://odp.trrp.net/Data/Documents/Details.aspx?document=1814

Therefore, for the Trinity River to be protected, the revised Biological Opinion should require that Reclamation's is required to comply with the following terms and conditions and that Reclamation's Trinity River water permits be amended as well, as directed in SWRCB Water Quality Order 89-18.[31] The conditions for Reclamation are as follows:

1. Conformance with the instream fishery flows contained in the Trinity River Record of Decision.

2. Provision for release of Humboldt County's 50,000 AF in addition to fishery flows per the 1955 Trinity River Act.

3. Inclusion of permit terms and conditions to require Reclamation to comply with the Trinity River temperature objectives contained in the Water Quality Control Plan for the North Coast Region (NCRWQCB) for all relevant time periods and for all uses of Trinity water diverted to the Sacramento River.

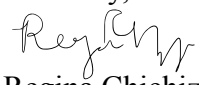
4. A requirement for a minimum cold-water storage in Trinity Reservoir adequate to preserve and propagate all runs of salmon and steelhead in the Trinity River below Lewiston Dam during multi-year drought. Based on studies to date, a range of 900,000 AF to 1.4 million AF is appropriate.

5. Require Reclamation to address the temperature issue in Lewiston Reservoir through a feasibility study and environmental document to follow up on the 2012 preliminary technical memorandum by Reclamation.

6. When releases from Spring Creek are more than two degrees Fahrenheit warmer than releases from Shasta Dam, limit the export of Trinity River water to the Sacramento River to the amount necessary to meet Trinity River Basin Plan Temperature Objectives. This protects both Trinity and Sacramento River salmon.

Thank you for your consideration.

Sincerely,



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[31] See SWRCB Water Quality Order 89-18 (pages 18 and 19) at http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/1989/wq1989_18.pdf

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March 25th, 2022

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Re: Emergency Interim Actions to Protect Tribal Trust Assets of the Trinity River and the Initiation of Consultation on the Trinity River Division of the Central Valley Project under the Endangered Species Act

Mr. Palumbo and Ms. Coit:

The Hupa and Yurok have relied upon the fisheries of the Trinity River since time immemorial to nourish our environment, people, and culture. In more recent times we have cooperated with the federal government to restore the river and its' fisheries from the damage done by the implementation of the Trinity River Division (TRD) of the Central Valley Project (CVP), so that once again the river can support healthy runs of fish that our culture depends upon. However, reckless over allocation and diversion of water resources continue to degrade habitat conditions needed to support migrating, holding, and spawning salmon, as well as their incubating eggs. In the face of these trying conditions we remain committed to being full and active partners in the restoration of the Trinity River.

Reclamation lacks coverage for take from operation of the TRD for listed Southern Oregon and Northern California Coastal (SONCC) Coho Salmon under the Endangered Species Act (ESA). SONCC Coho Salmon are severely imperiled and low abundance restricts harvest opportunity for tribal and non-tribal fisheries, partially due to take caused by operation of the TRD. The National Marine Fisheries Service 2000 Biological opinion for the Trinity River mainstem fishery restoration EIS (NMFS, 2000) sets the limit on take of SONCC Coho at zero but take has occurred due to low storage conditions in Trinity Reservoir causing release of water insufficiently cold to protect spawning and incubation in the Fall of 2021 (Attachment 1). In addition, the 2000 BiOp reached a no-jeopardy and no adverse modification of critical habitat conclusions based on expected improved habitat conditions and survival of Coho

freshwater life stages, but Coho habitat conditions and Coho populations have declined precipitously as a result of TRD operations (Attachment 1). There is also a complete lack of analysis and disclosure of impacts of the TRD on two additional species listed since the year 2000 (Southern Resident - Killer Whale; Southern Distinct Population Segment – Eulachon), one of which supports a traditional tribal fishery held in trust by the federal government and the other which relies on the same fish that support tribal people. We are encouraged that Reclamation intends to reconsult with NOAA Fisheries under the ESA to rectify the unlawful, and irresponsible operation of the TRD and to analyze and disclose the impacts to the environment, listed species, and the fisheries that the federal government holds in trust for the Hoopa Valley and Yurok Tribes.

EMERGENCY INTERIM ACTIONS

Further, there is an immediate need for interim emergency measures to protect ESA listed SONCC Coho Salmon from foreseeable and excessive take due to limited inflow and cold-water resources. Because the amount of take allowed by the 2000 BiOp has been exceeded and will continue to be exceeded under current TRD operations, Reclamation has lost incidental take coverage and is liable for take that occurs. To avoid and minimize take, further harm to SONCC Coho Salmon, and comply with the 1955 Act (PL 84-386) authorizing the TRD, Reclamation should implement emergency measures during the reinitiated consultation.

Current protections offered by state and federal regulation are not adequate, as warm water in Trinity River Hatchery from October through December of 2021 contributed to losses of gravid adults, eggs, and embryos of listed SONCC Coho Salmon. These same water temperature conditions existed in natural spawning areas below Lewiston Dam and almost certainly resulted in undocumented losses of naturally spawning fish and their progeny (Attachment 1). Existing temperature targets on the Trinity River were developed for Chinook Salmon on the Sacramento River in the early 1990's. More recent research has shown that Coho Salmon require colder water during reproduction (Carter, 2006). Reclamation's operation forecasts for this water year predict even lower storage and higher release temperatures during spawning than were observed in 2021. Reclamation must take every action possible to provide for the preservation and propagation of Trinity River fish and wildlife by curtailing trans-basin diversion and by bypassing power production. Reduction of trans-basin water deliveries from the TRD must occur immediately if cold-water reserves are to be maintained to meet the habitat conditions required by SONCC Coho salmon reproduction in the Trinity River.

The TRD of the CVP was authorized by the 1955 Trinity River Act (1955 Act) for the purpose of diverting water from the Klamath River Basin to the Sacramento River Basin, provided that "appropriate measures to insure preservation and propagation of fish and wildlife" be taken (Provision 1). However, management measures continue to fall tragically short of meeting legal requirements of Provision 1. The ecosystem collapse caused by the TRD resulted in the Trinity River Basin Fish and Wildlife Management Act of 1984, mandating recovery of fisheries resources held in trust by the federal government, which was determined to be "unlawfully long overdue" by the 9th Circuit Court of Appeals in 2004. The diversion of surplus water is conditional upon the fulfillment of Provision 1. Interim actions prior to the completion of a new biological opinion not only have to meet the ESA's no jeopardy standard for listed species but are required to meet the higher bar of the original authorizing act. Reclamation must ensure needs of the Trinity River are met prior to any other use of Trinity River water, such as filling of Whiskeytown Reservoir for recreation, conveyance of water to the Sacramento Basin, or hydropower production.

We ask that you analyze and implement accordingly the following emergency measures in a timely manner to help mitigate foreseeable and imminent impacts of the TRD to the preservation and propagation of fish and wildlife resources of the Trinity River:

1) Do not use Trinity River water for the purpose of filling Whiskeytown Reservoir in advance of the diversion season;

2) Curtail trans-basin diversion to the maximum extent possible while keeping Trinity River releases suitably cold to support fish and wildlife;

3) Bypass power as needed to provide cold water to the Trinity River;

4) Adhere to colder temperature requirements of Coho Salmon during reproduction (Nov 1 - Dec 31; Attachment 1)

REINITIATED CONSULTATION

The unique authorization of the TRD by the 1955 Act, and the Provisions of that act, require that in-basin needs are prioritized before Trinity River water can be exported for other purposes (reaffirmed by Solicitor of Interior Tompkins December 23, 2014, opinion). Moreover, DOI Solicitors Krulitz (December 7, 1979) - **Memorandum from Solicitor to the Assistant Secretary, Land and Water Resources** concluded that fishery flows for "in-basin needs take precedence over needs to be served by out-of-basin diversion" of Trinity River water to the Central Valley. Id at 3. The scoping notice of intent (NOI) includes in the purpose and need meeting the requirements of the Reclamation Act "and other federal law." The 1955 Act constitutes such a law and contains requirements that must be met by the proposed ESA action and preferred alternative under the National Environmental Policy Act (NEPA). The NOI acknowledges that the proposed action must protect Indian trust assets in the Trinity River. Accordingly, the proposed action for the ESA consultation and preferred alternative under NEPA must ensure in-basin fish and wildlife needs are met before any water is identified as surplus and available for out-of-basin diversions.

To meet these requirements of the diversion, the pending re-consultation on operations of the TRD must remain separate and be completed prior to that of the larger CVP. This will ensure that environmental impacts of reservoir management and water quality and quantity of river releases in the Trinity River Basin can be considered independent of the impacts in the Sacramento River. The resulting 'surplus' Trinity River water, after all in-basin needs are satisfied, can then be considered for possible trans basin diversion inputs to the evaluation of environmental impacts of the larger CVP to the Sacramento River system and its ESA listed species. No impacts in the Sacramento Basin should be attributed to any lack of diversions from the Trinity River, as no water is made available by the authorizing congressional act unless it is surplus to the in-basin needs of the Trinity.

We ask that you require the following during development of proposed action and preparation of a Biological Assessment of the TRD and any resulting proposed and final action and assessment under the NEPA:

1) Compliance with California Water Rights Order 90-5 and new colder Coho Salmon specific temperature targets at release from Lewiston Dam during spawning and incubation;

2) Multi-year drought, and climate change must be explicitly addressed through protective storage measures and any proposed action reduces risk of impacts to Trinity River;

3) Water volumes for the preservation and propagation of fish and wildlife, by water year type, released to Trinity River meet or exceed those established under the 2000 Trinity River ROD and are to be managed throughout each year for the benefit of Trinity River fisheries by implementing science based adaptive management administered by the Trinity River Restoration Program and Trinity Management Council;

4) Compliance with Provision 2 of the 1955 Act acknowledging and accounting for the right of downstream users on the Trinity River to no less than 50,000 acre-feet of water volume stored in Trinity Reservoir annually (in addition to Provision 1 volume);

5) Inclusion of a long-term plan to replace, upgrade, or remove infrastructure identified to pose a risk to preservation, propagation, or recovery of fish and wildlife of the Trinity River or inhibit implementation of adaptive management;

6) Coordinate management of the Trinity River (including water quality of dam release) with management of the Klamath Basin, while surplus water volume for other uses, including hydropower production and water to be diverted, is formally coordinated with the CVP;

7) Both the Hoopa Valley and Yurok Tribe, who hold federally reserved fishing rights, be granted Co-lead status for environmental documents on the Trinity River Division.

While we understand the complex situation that Reclamation and regulatory agencies are in regarding competing interests between two basins connected by this water project, these are the exact reasons that the provisions were included in the authorizing 1955 Act and further documented in the contemporaneous discussion that occurred in Congress (USHOR, 1955). We ask that you take extraordinary measures to use the existing capabilities of the TRD to save our federally reserved trust fisheries resources during this trying water year, as well as the next two water years that will proceed before completion of reinitiated consultation. We look forward to working with the agencies tasked with determining and regulating future operations of the TRD and ensuring the mandated recovery of the productivity of Trinity River fisheries, which is vital to meet the cultural, ceremonial, subsistence, and economic needs of the Hoopa Valley and Yurok Tribes. Please consider these as scoping comments for the notification of intent for development of a new EIS for Long-term Operation of the CVP and State Water Project. Because Reclamation will be making operational decisions beginning in April that could foreclose needed emergency measures, we ask that you respond to our request for emergency measures for this water year by April 8th, 2022.

Sincerely,

Joeseph L. James, Chairman,
Yurok Tribe

Joe Davis, Chairman,
Hoopa Valley Tribe

CC:

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Jared Huffman, U.S. Congressman – CA 2nd District

REFERENCES:

Carter K, 2006. The Effects of Temperature on Steelhead Trout, Coho Salmon, and Chinook Salmon Biology and Function by Life Stage. Implications for Klamath Basin TMDLs. California Regional Water Quality Control Board, North Coast Region. 27 pp.

National Marine Fisheries Service (NMFS). 2000. Biological opinion for the Trinity River mainstem fishery restoration EIS and its effects on southern Oregon / northern California coast coho salmon, sacramento river winter-run chinook salmon, central valley spring-run chinook salmon, and central valley steelhead. National Marine Fisheries Service, Southwest Region, Long Beach, California. Available: https://www.trrp.net/library/document?id=1240.

USHOR (U.S. House of Representatives). 1955. 84th Congress, 1st Session, Report No. 602. ct Authorizing the Secretary on the Interior to construct, operate, and maintain the Trinity River Division, Central Valley Project, California, under federal reclamation laws. Report

Attachment 1

Poor Survival during Incubation of Trinity Coho Salmon Eggs in 2021

Status of Coho Salmon

Trinity River Coho salmon are part of the Southern Oregon Northern California Coastal (SONCC) Coho salmon Evolutionarily Significant Unit (ESU) that was listed under the federal Endangered Species Act (ESA) in 1997. Coho salmon populations within this ESU are extremely depressed, with the Trinity River populations being no exception. In fact, an ad hoc group formed by the Pacific Fisheries Management Council (PFMC) to assess the risk of extinction for some of the 39 SONCC Coho salmon populations determined that the aggregate of Trinity River populations (Upper Trinity, Lower Trinity, and South Fork Trinity Rivers) have a 64% risk of going extinct over the next 20 years, even if there are no harvest impacts upon these populations[1].

The abundance of Trinity Coho salmon has continued to decline since their listing under the ESA. For example, the average abundance of natural origin (not from a hatchery) Coho salmon adults from 2000 to 2009 was 2,008 fish, whereas the average abundance from 2010 to 2019 was 1,065 (Table 1) adult Coho; a decline of 47%. What is even more alarming is the decline in recent years, given the average abundance of natural origin spawners from 2010 to 2014 was 1,593 adults, however this average dropped to 185 adults for the years 2015, 2017, and 2019 (adequate data not available for 2016 and 2018); a decline of 88% during the recent five-year period. While abundance estimates that include hatchery fish show a similar decline (Table 1), they need to be considered with caution, given that production of Coho smolts at Trinity River Hatchery was reduced from 500,000 to 300,000 in 2015.

Further Decline from Warm Late-fall Incubation Temperatures in 2021

Coho Spawned at Trinity River Hatchery

The decline of Trinity River Coho salmon was exacerbated during 2021, when incubating eggs were subjected to excessively warm water temperatures during the late fall/winter. This was reflected in the low survival of incubating Coho salmon eggs at Trinity River Hatchery (TRH) during the 2021/2022 spawning season (Table 2[2]). Coho salmon eggs during 2021 at Trinity River Hatchery (TRH) were often exposed to average daily water temperatures of approximately 12˚C, (Table 2) well above the 6 - 10 ˚C range necessary for optimal survival of incubating Coho salmon eggs (USEPA 2001 in Carter 2006 and WDOE 2002 in Carter 2006[3]). As can be seen in Table 2, temperatures for spawning and subsequent incubation, at TRH were often near 12 ˚C. According to Kevin Kwak, CDFW Fisheries Veterinarian, warm water temperatures are thought to be the primary reason for the low survival of Coho salmon eggs at TRH during the winter of 2021/2022. As is evident in Figure 1, there was an inverse correlation between temperatures at the time of spawning and survival from the "green" to "eyed" egg stages, with survival at the warmer temperatures being extremely low, ranging from 9.5% to 39%.

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[1] Pacific Fishery Management Council Southern Oregon/Northern California Coast Coho Salmon: Fishery Harvest Control Rule Risk Assessment, Draft Final Report, November 2021. 156 pp.

[2] Data obtained from Mark Clifford, Senior Environmental Scientist, California Department of Fish and Wildlife.

[3] Carter K, 2006. The Effects of Temperatue on Steelhead Trout, Coho Salmon, and Chinook Salmon Biology and Function by Life Stage. Implacations for Klamath Basin TMDLs. California Regional Water Quality Control Board, North Coast Region. 27 pp.

Table 1. Escapement data for adult SONCC Coho salmon (natural and hatchery origin) to natural spawning grounds and at Trinity River Hatchery, 2000 - 2019. 2016 and 2018 were excluded in analysis due to inadequate data to estimate the natural origin component of the escapement.

Return Year	Trinity Natural Origin Adults in Wild[1]	Trinity Hatchery Origin Adults in Wild[1]	Trinity Total Adults in Wild[1]	Trinity Hatchery[4]
2000	288	6,297	6,585	3,461
2001	2,945	15,770	18,715	9,755
2002	372	7,440	7,812	6,495
2003	3,264	10,991	14,255	10,396
2004	7,830	15,287	23,117	9,906
2005	1,728	9,974	11,702	16,624
2006	1,416	7.454	8,870	9,839
2007	940	1,612	2,552	2,653
2008	861	2,204	3,065	4,539
2009	438	1,718	2,156	2,477
2010	624	2,146	2,770	3,899
2011	991	2,403	3,394	1,924
2012	1,577	6,335	7,912	7,357
2013	3,948	8,935	12,883	6,204
2014	823	6,405	7,228	2,971
2015	459	166	625	3,059
2016			635	482
2017	34	107	141	270
2018	1	502	503	556
2019	63	358	421	643
Avg. 2000-2009	2,008	7,875	9,883	7,615
Avg. 2010-2019 (2018 excluded due to small sample size)	1,065	3,357	4,001	2,979
Avg. 2010-2014	1,593	5,245	6,837	4,471
Avg. 2015-2019 (2018 excluded due to small sample size)	185	210	396	1,324

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[4] CDFW, 2021. Annual Report Trinity River Basin Salmon and Steelhead Monitoring Project: Chinook and Coho Salmon and Fall-Run Steelhead Run-Size Estimates Using Mark-Recapture Methods 2020-21

Table 2. Temperatures at time of spawning, and survival of Coho salmon eggs at Trinity River Hatchery from "green" to "eyed" stages, 2021/2022[5]

Egg Lot	Spawn Date	Avg Daily Water Temp (˚C) at TRH	Green Eggs Kept	Eyed Eggs that Survived	% "Eyed" Egg Survival
1	11/2/2021	11.9	30,366	2,882	9.5%
2	11/9/2021	11.9	75,188	19,133	25.4%
3	11/16/2021	11.7	103,369	40,687	39.4%
4	11/23/2021	11.7	121,153	26,938	22.2%
5	11/30/2021	10.0	192,785	77,818	40.4%
6	12/7/2021	10.3	170,373	80,298	47.1%
7	12/14/2021	9.4	101,713	71,159	70.0%
8	12/21/2021	8.1	11,245	5,328	47.4%
9	1/4/2022	6.7	2,860	2,860	100.0%

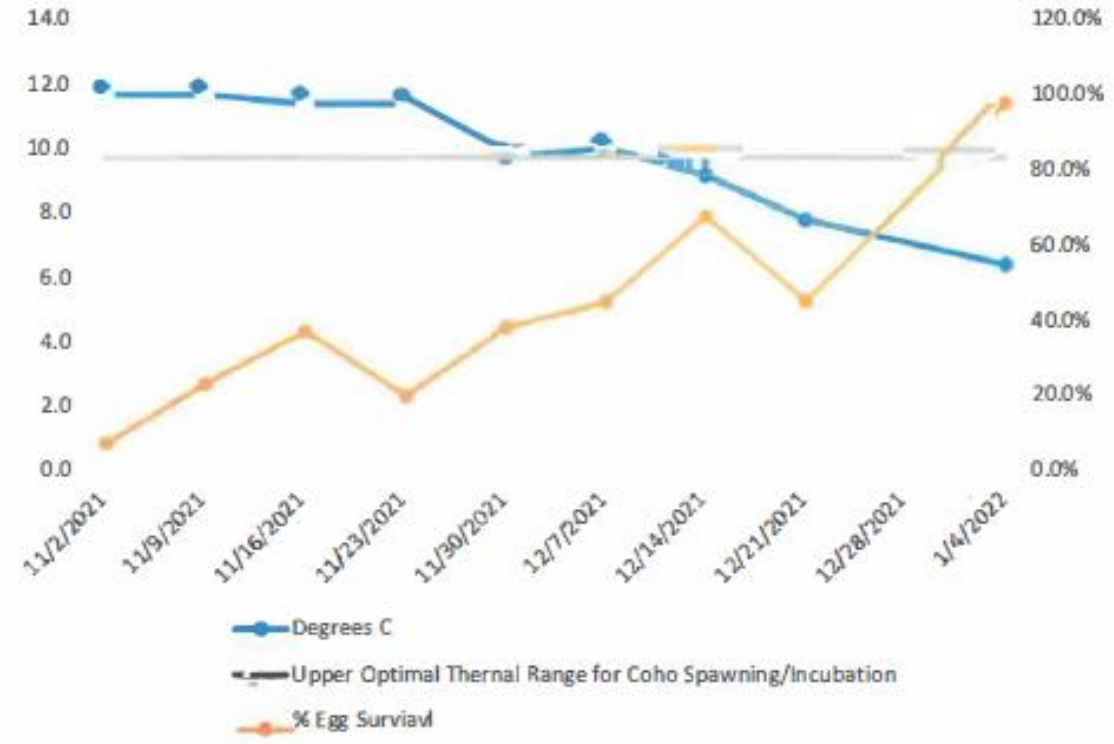

Figure 1. Survival of Coho salmon eggs relative to average daily water temperature at time of spawning, 2021/2022, and upper end of optimal temperature range for spawning/incubating Coho salmon eggs.

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[5] Data obtained from Mark Clifford, Hatchery Senior Environmental Scientist, California Department of Fish and Wildlife staff, February 2022.

Coho Spawned in Natural Areas

Warm water temperature was a problem in the Upper Trinity River as well (Figure 2) during late-fall 2021, indicating that survival of Coho salmon eggs naturally spawned/incubated in the Upper Trinity River was also low. This is a substantial concern given the large numbers of Coho salmon that typically spawn in the mainstem Trinity River, especially in the upper 40 miles of the Trinity River (Table 3). Furthermore, the upper two miles of the Trinity River (near Lewiston, where Figure 2 temperatures were measured) during some years contains the highest densities of naturally spawned Coho salmon of the Trinity River, as documented in 2008 (Sinnen et al, 2010 as cited in NMFS 20176).

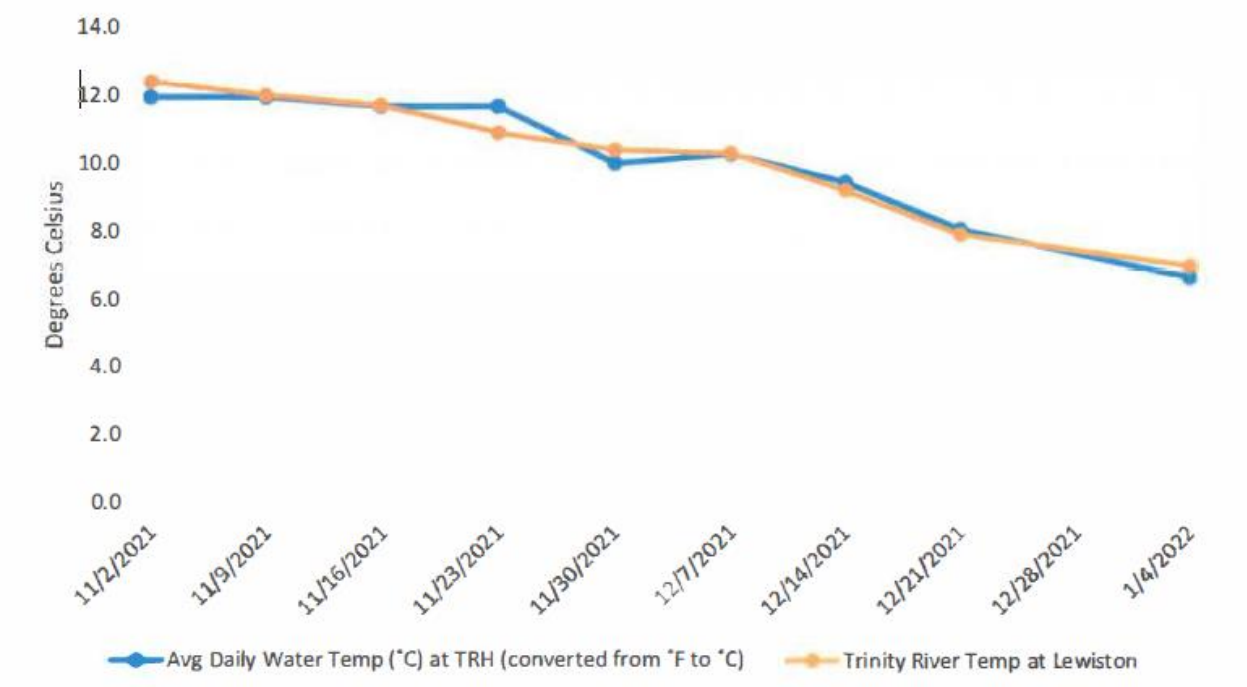

Figure 2. Daily average water temperatures at TRH and in the Trinity River near Lewiston CA, November 2, 2021 to January 4, 2022. Dots represent dates fish were spawned at TRH.

Table 2. Estimated number of Coho salmon redds in the mainstem Trinity River and mainstem Trinity River upstream of the North Fork Trinity River[6]

Year	Estimated Mainstem Coho Redds	Estimated Mainsten Coho Redds Upstream of North Fork	Percent of Total Redds Upstream of North Fork
2002	662	658	99%
2003	106	106	100%
2004	1,320	1,305	99%
2005	935	927	99%
2006	639	634	99%
2007	141	131	93%
2008	444	442	100%
2009	133	129	97%
2010	545	544	100%
2011	126	115	91%
2012	273	266	97%
2013	1,018	985	97%
2014	473	441	93%
2015	40	39	98%

Sources: Chamberlain et al. 2012a; Chamberlain et al. 2012b; Chamberlain et al. 2015a; Chamberlain et al. 2015b; Chamberlain et al. 2015c; Rupert et al. 2015.

Low Reservoir Levels in Late Fall 2021 Created Warm River Temperatures

During the late fall of 2021, Trinity Reservoir was managed to low storage levels (677,712 of storage on November 2), resulting in warm water temperatures being released to the Trinity River. As noted in Kamman (1999[7]**):** "During dry periods, when Trinity reservoir levels get too low, warmer surface waters are drawn into the Trinity dam powerhouse intake, resulting in relatively warm water releases to Lewiston Lake. In turn, these warm temperatures are propagated through Lewiston Lake to the river." Studies have been conducted to determine the appropriate end-of-year Trinity reservoir levels so that river releases are cool enough to meet the biological needs of fish in the Trinity River. According to Bender (2012[8] **),** a cursory sensitivity analysis indicated that end-of-September carryover storage of less than 750,000 acre-feet is potentially thermally problematic for cold water fish in the Trinity River. According to Deas (1998[9]**):** "In general, elevated water temperature at the power/main intake elevation was an issue for carry-over storage of 750,000 AF. Only under certain circumstances was temperature a

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[6] NMFS 2017. Hatchery and Genetics Management Plan for Trinity River Hatchery Coho Salmon. 117 pp.
[7] Kamman 1999. Temperature Analysis of Proposed Trinity River Fish and Wildlife Restoration Flow Alternatives Using the Better Model.
[8] Bendor M.D., 2012. Bureau of Reclamation, Technical Service Center, Technical Memorandum 86-68220-12-06. 9 Deas, M.L., 1998. Trinity Reservoir Carryover Analysis.

concern at 1,250,000 AF, and there were no temperature concerns for carry-over storage of 1,750,100 AF."

As noted in a recent study (Asarian et al. in preparation10): "The relationship between reservoir storage and water temperature at the elevation of the main outlet appears to be non-linear, with an inflection point around 1,250,000 AF where temperatures rise increasingly steeply as reservoir storage drops beyond this level (see Figure 3)".

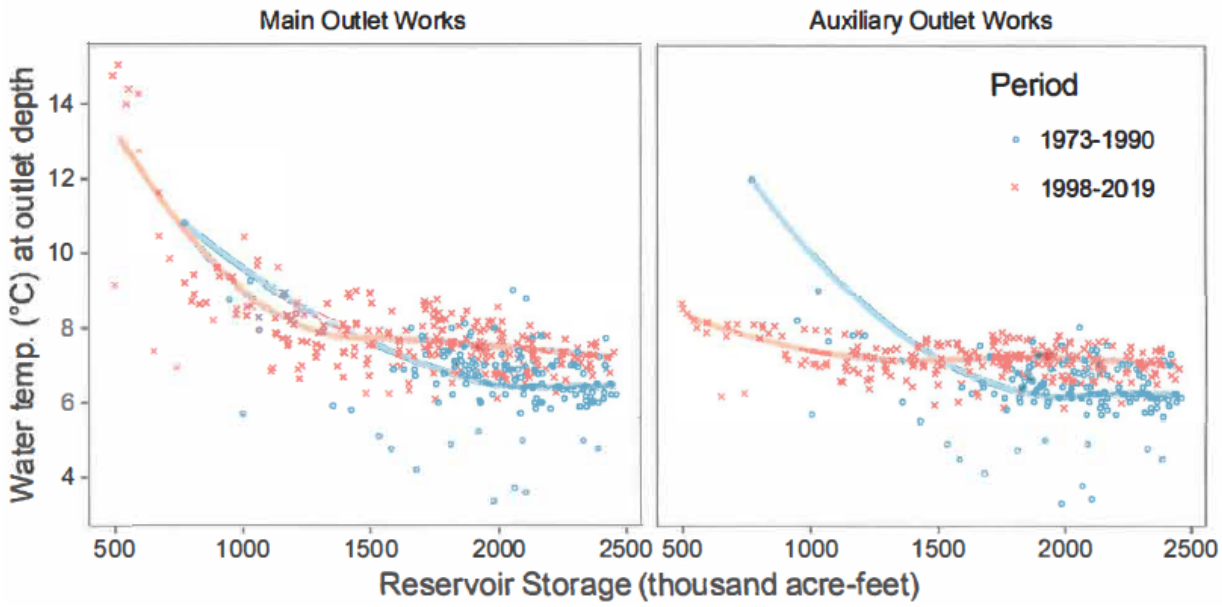

Figure 3 (taken from Asarian et al, in preparation). Comparison of the 1972-1990 and 1998-2019 time periods for the relationship of Trinity Reservoir storage volume to water temperatures at elevations of main outlet (2114 ft) and auxiliary outlet (2000 ft) for all months (January-December) in 38 years from 1972-2019, excluding years without data. Data extracted from reservoir profiles measured by USBR (2020). At low reservoir storage, a few high temperature values cause the blue trend line for 1973-1990 be higher than red trend line for the 1998-2019, but this an artifact of particular conditions that occurred in 1977 and not representative of the overall period3. Lines are LOESS (Locally Estimated Scatterplot Smoothing) smoothers. Concept for figure adapted from Barajas (2016).

During 2021, when warm water temperatures resulted in low survival of Coho salmon (November 2 - December 14 - see Figure 1), storage in Trinity reservoir ranged from 677,712 AF to 707,699 AF; well below levels recommended to protect cool Trinity River temperature releases. While other factors, such as withdrawal rates and temperature of winter inflow, can affect the relationship between release temperatures and the amount of water stored in Trinity Reservoir, Trinity Reservoir carryover storage (amount of water stored at the end of the water year- September 30) is a primary driver of the temperature of water released to the Trinity River.

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[10] Asarian J.E., K. De Julio, D. Gaeuman, S. Naman, and T. Buxton in preparation/review. Synthesizing 87 years of scientific inquiry into Trinity River water temperatures. 225 pp.

New Temperature Targets to Prevent Take of SONCC Coho Salmon Adults, Eggs, and Embryos

For the Trinity River to support SONCC Coho salmon reproduction, management measures need to be implemented that result in temperatures conducive to the survival of Coho salmon eggs. Such measures include maintaining adequate reservoir storage levels (well above 750,000 AF and likely near 1.25 million AF), potential use of the auxiliary outlet to access colder water (Deas 1998[9], Kamman 1999[7]), and potentially other measures to improve capabilities of TRD infrastructure to control temperature of release independent from storage and operations in Lewiston Reservoir, including those identified by Bender (2012[8]). Additionally, a new Coho salmon specific temperature threshold of 10 ˚C or less[3] for releases from Lewiston Reservoir to the Trinity River should be adhered to starting November 1st and extending to December 31st annually.

State Water Resources Control Board

April 18, 2022

Cindy Meyer
Bureau of Reclamation, Bay-Delta Office
By Email: sha-MPR-BDO@usbr.gov

COMMENTS ON NOTICE OF INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT ON THE 2021 ENDANGERED SPECIES ACT REINITIATION OF SECTION 7 CONSULTATION ON THE LONG-TERM OPERATION OF THE CENTRAL VALLEY PROJECT AND STATE WATER PROJECT

Dear Ms. Meyer,

Thank you for the opportunity to provide comments to the U.S. Bureau of Reclamation (Reclamation) on the Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) on the 2021 Endangered Species Act (ESA) Reinitiation of Section 7 Consultation on the Long-Term Operation (LTO) of the Central Valley Project (CVP) and State Water Project (SWP) (collectively, Projects). The State Water Board also appreciates the opportunity to participate in regular meetings with Reclamation, the Department of Water Resources (DWR), and State and federal fisheries agencies to discuss reinitiation of consultation on the LTO, including the issues discussed in this letter.

The mission of the State Water Resources Control Board (State Water Board) and Regional Water Quality Control Boards (Regional Water Boards) is to preserve, enhance, and restore the quality of California's water resources and drinking water for the protection of the environment, public health, and all beneficial uses, and to ensure proper water resource allocation and efficient use, for the benefit of present and future generations. The State Water Board administers water rights in California, including the Projects' water rights and the various conditions placed upon those rights in State Water Board Decision 1641 (D-1641), Water Right Order 90-5 (Order 90-5), and other orders and decisions. The State Water Board and Regional Water Boards also have primary authority over the protection of the State's water quality. To protect water quality, the State and Regional Water Boards develop water quality control plans that identify beneficial uses of water, water quality objectives to protect those beneficial uses, and a program of implementation to achieve the objectives, as well as monitoring and special studies and reporting requirements. These water quality control plans include the State Water Board's Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan) and the Central Valley and San Francisco Bay

Water Boards' water quality control plans for the Central Valley and San Francisco Bay that are relevant to the Proposed Project.

Purpose and Need for the Proposed Action:

The stated purposes in the NOI for reinitiating the ESA Section 7 consultation are to modify the previous Proposed Action described in the 2019 EIS, address the review of the 2019 Biological Opinions (BiOps), and reconcile CVP operating criteria with SWP operating criteria required by the Incidental Take Permit for Long-Term Operation of the SWP issued by the California Department of Fish and Wildlife (CDFW) on March 21, 2020 pursuant to the California Endangered Species Act (CESA) (2020 ITP).

The State Water Board appreciates Reclamation's effort to reconcile CVP operations with SWP operations to ensure those requirements are protective of native fish species and aquatic ecosystems. The State Water Board recommends that Reclamation include an alternative that incorporates operational criteria that are consistent with the 2020 ITP for both the CVP and SWP that enhance instream flows and fish and ecosystem protections including: contribution to Delta outflow during the spring and other periods; management of Old and Middle River (OMR) flows and water exports based on the seasonal and daily entrainment thresholds for fish species (winter-run and spring-run Chinook salmon, Delta smelt, and longfin smelt); storm-related project operations under OMR Flexibility; monitoring and real-time operations; and, enhanced drought planning.

This comment letter includes preliminary comments based on State Water Board staff's review of the NOI. On September 25, 2019, the State Water Board provided a comment letter (attached) to Reclamation on the Draft EIS for the LTO of the Projects. These comments are largely still applicable to the Proposed Project.

Baseline Conditions:

The NOI suggests that project alternatives would be developed with combinations of operations of CVP and SWP facilities and diversions, construction actions, habitat restoration, conservation hatchery practices and monitoring and special studies while a No Action Alternative (NAA) would be the continued implementation of the 2020 Record of Decision (ROD) that includes the 2019 Biological Opinions (BiOps) and the Proposed Project in the 2019 EIS. It is noted that the 2020 ROD became effective February 18, 2020 when it was signed, and the Incidental Take Permit (ITP) for Long-Term Operation of the SWP was issued by the California Department of Fish and Wildlife (CDFW) on March 21, 2020. Given the short duration, extreme drought conditions over the last several years, and on-going legal challenges against the implementation of the 2019 BiOps, 2020 ROD, and ITP for the CVP and SWP, respectively, there is a lack of data regarding implementation of the 2019 BiOps and 2020 ROD, especially the impacts on aquatic species and other natural resources. It would be informative to consider the conditions prior to the 2019 BiOps and 2020 ROD as a point of comparison given these issues.

Range of Alternatives:

The State Water Board recommends that Reclamation develop and evaluate a range of project alternatives that would increase protections for fish and wildlife and aquatic ecosystems while improving water supply reliability. Available scientific knowledge indicates that decreasing freshwater flows in the Bay-Delta watershed and increasing exports and associated reverse flows (i.e., more negative OMR flows) in the interior Delta have negative impacts on the survival and abundance of native fish species, including threatened and endangered species that are the subject of the existing BiOps for the Projects. There is a significant body of scientific evidence that increased freshwater flows into and through the Delta and aquatic habitat restoration are needed to protect Bay-Delta ecosystem processes and native and migratory fish.

The State Water Board recognizes and appreciates the commitment embodied in President Biden's Executive Order 13990 (EO 13990) entitled "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis." In the spirit of EO 13990, the State Water Board recommends that Reclamation develop and analyze additional project alternatives that would result in increased Delta inflows and outflows, reduced reverse flows in the Delta, and improved habitat conditions suitable for the native fish species and aquatic ecosystem conditions.

Bay-Delta Plan Update and Voluntary Agreements:

The State Water Board recommends that the EIS evaluate a scenario that is consistent with the State Water Board's efforts to update and implement the Bay-Delta Plan to improve protections for native fish species. The Bay-Delta Plan updates are intended to provide for the reasonable protection of fish and wildlife beneficial uses by supporting and maintaining conditions necessary for the natural production of viable native fish and aquatic species populations rearing in, or migrating through, the Bay-Delta Estuary and associated tributaries. In 2018, the State Water Board updated the Lower San Joaquin River Flow and Southern Delta Salinity objectives in the Bay-Delta Plan and released a Framework for potential updates to Sacramento River and Delta inflow and outflow, interior Delta flow, and cold-water habitat objectives (Framework), which are supported by the science summarized in the State Water Board's 2017 Scientific Basis Report.

A potential voluntary agreement (VA) is being developed by water users (including Reclamation) to improve protections for fish and wildlife in the Bay-Delta watershed, including science and adaptive management actions that may help to address issues identified in this comment letter. A VA for the Sacramento River watershed tributaries could, if approved, act as alternative implementation methods for updated Bay-Delta Plan requirements. The State Water Board recommends that the EIS develop a project alternative that describes and analyzes flow and non-flow measures comparable to those included in the proposed VA. The State Water Board staff look forward to continuing to work with Reclamation and others in the VA process and are available to assist with the development of scenarios that serve this purpose.

Sacramento River:

In the Upper Sacramento River, Reclamation operates Shasta Reservoir and Keswick Dam to provide water for beneficial uses and habitat conditions for various runs of Chinook salmon and other anadromous fish including steelhead and green and white sturgeon. Because winter-run Chinook salmon are blocked from accessing upstream cold-water habitat by Shasta Dam, the species depends on cold water provided by Shasta Reservoir releases for their spawning, egg and alevin incubation, and juvenile rearing periods in the upper Sacramento River. Recent scientific studies[1] provide that flow volume and water temperature (from Keswick Dam) should be simultaneously considered in the context of fish life cycles to provide and sustain better habitat conditions for the listed fish species. The State Water Board recommends that Reclamation evaluate project alternatives that would meter out cold water supplies to provide temperature management over the winter-run and fall-run Chinook salmon temperature management periods in all water year types. Such alternative(s) should not result in additional impacts on other rivers (e.g., flows and temperatures in Feather and American rivers) and reservoirs (e.g., storages in Oroville and Folsom lakes).

The State Water Board also requests that Reclamation include alternatives that evaluate flow conditions under the Board's 2018 Framework for possible updates to the Bay-Delta Plan for the Sacramento River, its tributaries, and the eastside tributaries to the Delta. Reclamation included Alternative 4 in the 2019 EIS that evaluated a 55% unimpaired flow level from the Project tributaries with offramps to preserve cold water pool. Similar analyses should be included in the current EIS.

San Joaquin River:

As discussed above, the Bay-Delta Plan was updated in December 2018 to address lower San Joaquin River flows and south Delta salinity and it is in the process of being implemented. The Lower San Joaquin River Flow objectives require that 40% of unimpaired flows be maintained in the eastside tributaries in an adaptive range between 30% and 50% of unimpaired flows and the program of implementation includes flexibility to shape flows (e.g. incorporate pulse flows instead of a strict percentage of flow) in order to better achieve ecosystem functions. The adopted Bay-Delta Plan update should be considered as part of the regulatory baseline in the EIS.

The State Water Board also recommends that Reclamation include other measures to protect San Joaquin River steelhead and fall-run Chinook salmon that are an important

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[1] Daniels, M. E., and E. M. Danner. 2020. The drivers of river temperatures below a large dam. Water Resources Research 56, e2019WR026751. https://doi.org/10.1029/2019WR026751.

Hallnan, R., L. Saito, D. Busby, and S. Tyler. 2020. Modeling Shasta Reservoir water temperature response to the 2015 drought and response under future climate change. Journal of Water Resources Planning and Management DOI: 10.1061/(ASCE)WR.1943-5452.0001186

Zarri, L. J., E. M. Danner, M. E. Daniels, and E. P. Palkovacs. 2019. Managing hydropower dam releases for water users and imperiled fishes with contrasting thermal habitat requirements. Journal of Applied Ecology 56: 2423-2430. DOI: 10.1111/1365-2664.13478.

food source for listed Southern Resident killer whales, including the Vernalis inflow to export ratio (or equivalent protection) during April through May (RPA Action IV.2.1 of 2009 NMFS BiOp), possible installation of the Head of Old River Barrier, and more positive OMR flows during the winter and spring period. The best available science[2] indicates that higher San Joaquin River inflows along with the installed Head of Old River Barrier enhanced through-Delta survival of San Joaquin Basin-origin juvenile salmonids and reduced their routing into the interior Delta where survival rates were low. In addition, as noted in prior comment letters, movement of the compliance location for dissolved oxygen requirements on the Stanislaus River would require changes to Reclamation's water rights and updates to water quality control plan requirements supported by scientific information that such changes would provide for the reasonable protection of fish and wildlife.

Delta and San Francisco Bay Estuary:

The State Water Board recommends that Reclamation develop actions that would result in higher Delta inflows and outflows to enhance habitat conditions for native fish species and aquatic ecosystem conditions in the Delta and Estuary. Delta smelt, longfin smelt, Sacramento splittail, Chinook salmon, and other aquatic species utilize the Delta and Suisun Marsh as their spawning and rearing habitats, and migratory routes, and their population-level success has been known to depend on the extent of Delta outflows (also expressed as X2) and associated extents of favorable habitats (low salinity zone). The State Water Board's[3] 2017 Scientific Basis Report analyzed such population-level relationships of several important aquatic species to Delta outflows, which could provide valuable information for the flow related habitat- and population-level impact assessments in the EIS.

Climate Change and Drought Conditions:

The State Water Board recommends Reclamation incorporate the potential for reduced streamflow conditions in the Delta and its watershed under climate change. Despite the slightly higher precipitation forecasted in the Central Valley under the climate change

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[2] Buchanan, R.A., P. L. Brands, and J.R. Skalski. 2018. Survival of juvenile fall-run Chinook salmon through the San Joaquin River Delta, California, 2010-2015. N. Amer. J. Fish. Manage. 38(3): 663-669.

Buchanan, R.A., E. Buttermore, and J. Israel. 2021. Outmigration survival of a threatened steelhead population through a tidal estuary. Canadian Journal of Fisheries and Aquatic Sciences.

Buchanan, R. A., and J. R. Skalski. 2020. Relating survival of fall-run Chinook Salmon through the San Joaquin Delta to river flow. Environmental Biology of Fishes **103**:389-410. https://doi.org/10.1007/s10641-019-00918-y.

[3]SWRCB. 2017. Scientific Basis Report in Support of New and Modified Requirements for Inflows form the Sacramento River and its Tributaries and Eastside Tributaries to the Delta, Delta Outflows, Cold Water Habitat, and Interior Delta Flows (https://www.waterboards.ca.gov/water_issues/programs/peer_review/docs/scientific_basis_phase_ii/201710_bdphaseII_sciencereport.pdf)

scenarios, scientific studies[4] suggest that a warmer climate will bring changes in precipitation patterns (from more snow to more rain), higher temperatures, vegetation expansion, and longer growing seasons, which overall would result in lower annual streamflow than the current conditions. Such reduced streamflow, including Delta inflows, conditions under future climate change could be incorporated to model the hydrology, water supply, and ecosystem protection as a sensitivity analysis. It is forecasted that future climate change will bring more frequent and intense drought conditions in the Central Valley watershed; therefore, Reclamation should consider project alternatives and actions that would enhance water supply reliability in the future under such anticipated constraints.

The NOI states that Reclamation along with DWR will develop alternatives to operate the CVP and SWP in response to drier years and drought conditions with actions such as temporary urgency change petitions (TUCP). Reclamation and DWR have filed drought-related TUCPs, and the State Water Board has issued temporary urgency change orders (TUCO), in response to severe past drought conditions. However, a TUCO can only be issued when the State Water Board finds: (i) the applicant has an urgent need for the change; (ii) the proposed change will not cause injury to any lawful water user; (iii) the proposed change is in the public interest, and (iv) the proposed change will not result in an unreasonable effect on fish, wildlife, or other instream resources. The Water Code states that the State Water Board shall not find a petitioner's need to be "urgent" if the petitioner has not exercised due diligence in petitioning for a change pursuant to provisions other than a temporary urgency change. (Water Code, § 1435, subd. (c).) That means that issuance of a TUCO should be considered a rare and unforeseen event and not part of planned operations. Instead, planned changes to water right requirements should be pursued through a long-term process (i.e. a standard water right change petition).

New Storage, Conveyance, and Other Water Supply Infrastructure:

Reclamation intends to develop alternatives to operate the CVP and SWP that would include potential future storage and conveyance projects in the watershed. The State Water Board assumes that the cumulative operational impacts of reasonably foreseeable projects such as Sites Reservoir and the Delta Conveyance Project would be included in Reclamation's analysis. Such analyses should include a quantitative evaluation of the cumulative effects of these projects on Delta inflows and outflows, water quality conditions (salinity, turbidity, temperatures, dissolved oxygen, algal

[4] Berghuijs, W. R., R. A. Woods, and M. Hrachowitz. 2014. A precipitation shift from snow towards rain leads to a decrease in streamflow. Nature Climate Change 4: 583-586. doi:10.1038/nclimate2246.

Goulden, M. L., and R. C. Bales. 2014. Mountain runoff vulnerability to increased evapotranspiration with vegetation expansion. PNAS 111: 14071-14075.

Milly, P. C. D., and K. A. Dunne. 2020. Colorado River flow dwindles as warming-driven loss of reflective snow energizes evaporation. Science. DOI:

blooms, aquatic vegetation, and other conditions) and the associated impacts on fish and wildlife and other beneficial uses of water, including in-Delta communities.

Conclusions:

State Water Board staff appreciates the opportunity to provide comments on the NOI. State Water Board staff looks forward to working with Reclamation, DWR, and the fisheries agencies to address the issues identified in this letter. The State Water Board may have further comments as Reclamation develops the EIS.

If you would like to discuss these comments further, please contact me at diane.riddle@waterboards.ca.gov.

Sincerely,

ORIGINAL SIGNED BY

Diane Riddle, Assistant Deputy Director
Division of Water Rights

DEPARTMENT OF RECLAMATION

SCOPING MEETING

REMOTE VIA MICROSOFT TEAMS

TUESDAY, MARCH 8, 2022

2:00 P.M.

Reported by:

Martha Nelson

APPEARANCES

STAFF

Mary Lee Knecht, Public Affairs Officer

David Mooney, Bay-Delta Office Manager

Peter Soeth

PUBLIC COMMENT

Regina Chichizola, Save California Salmon

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P R O C E E D I N G S

2:00 p.m.

TUESDAY, MARCH 8, 2022

MS. KNECHT: Hi everyone. We'll get started in just a minute while we wait for participants to get settled into the Teams meeting. I think we're good.

Greetings everyone. Welcome to the Bureau of Reclamation's first of six scoping meetings for the re-initiation of consultation for the long-term operation of the Central Valley Project and State Water Project. Thank you for joining us today. My name is Mary Lee Knecht. I'm the Public Affairs Officer for the California-Great Basin Region. On behalf of our Reclamation Team, we extend our appreciation to you for attending today's meeting and we value your input into the scoping process.

Today, I'm joined by Dr. Dave Mooney, who is Manager of our Bay-Delta Office, a few of our team members, who I'll introduce shortly. We also have Peter Soeth joining us from the Commissioner's Office who is helping us with meeting logistics.

If there are any elected officials or tribal members joining today, we will pause for any opening remarks you may have in just a few minutes. Dr. Mooney will then provide an overview of the project and scoping process. We'll then open it up for public input, which is

the primary reason we are here today.

So before we get started, a few housekeeping items and fine print.

As we are sharing information in an online format today, we may experience glitches or temporary issues. Please bear with us and we'll work through any unforeseen issues as swiftly as possible.

If you're having issues seeing or hearing the presentation, we recommend using the Microsoft Teams app on your computer or smart phone versus in your web browser.

This is a Microsoft Teams event. It's being recorded so we may accurately capture your comments. All remarks are on the record and for attribution. If you wish not to be recorded you may still provide comments by mail or email. All comments, both verbal and written, are subject to the Freedom of Information Act.

And for those using screens, you may turn on closed captioning by choosing that option from the menu in your righthand corner of your screen.

Dr. Mooney will be providing an overview of the project using a PowerPoint presentation. All meeting materials are also posted on our website and that is at www.usbr.gov/mp/bdo, that's like Mid-Pacific Bay-Delta Office.

Following the presentation, we will ask for

public input. If you would like to share a comment, please use the raise-hand function in the upper righthand corner of your computer screen and smart phone. You can also press star five on your phone's touchtone pad to raise hand for those of you who called.

We will call on participants in order and unmute you when it is your turn. Please announce your name and spell it out for us, please, and along with your affiliation before sharing your comment. You'll have three minutes to provide comments.

So the purpose of today -- today's scoping meeting is to encourage public input on the long-term operation of the DVP and SWPPP. We want to hear your insights and specific local information related to issues for the Environmental Impact Statement.

So now we'll pause to see if any elected officials or tribal members would like to make any opening remarks. If so, you can use the raise-hand function. Okay. All right.

So with that, I'll now turn it over to Dr. Dave Mooney for the presentation.

DR. MOONEY: Thank you, Mary Lee, and thanks to everybody for joining us today.

The CVP is a complex, multi-purpose network of dams, diversions, canals, powerplants and other facilities

in California's Central Valley and Delta.

As a major economic asset, we provide water for the top agricultural counties in California, which is the nation's leading agricultural state. The Central Valley grows more than a third of the country's vegetables and two-thirds of the country's fruits and nuts.

The CVP also supplies water to cities and towns, including major urban centers in the Greater Sacramento and San Francisco Bay areas. And the operation is coordinated with the California Department of Water Resources who operates the State Water Project to serve water to nearly 30 million people.

To protect the environment, we operate to Water Quality Control Plans developed by the State Water Resources Control Board, and we consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to avoid jeopardizing the continued existence of, and to avoid adversely modifying the critical habitats of, species listed under the Federal Endangered Species Act. The services provide Reclamation and DWR with biological opinions that permit the operation of the CVP and SWP.

A February 18th, 2020 Record of Decision implements the consultation that resulted in biological opinions from the services in 2019.

This past September, Reclamation requested to

reinitiate consultation due to anticipated modifications that may cause effects not analyzed in the 2019 biological opinions. These modifications would address the review of the 2019 biological opinions required by Executive Order 13990 titled Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. Modifications would voluntarily reconcile CVP operating criteria with requirements of the State Water Project under the California Endangered Species Act.

So why are we here? We're here because Reclamation intends to modify the long-term operation of the CVP and SWP. This is a federal action that requires compliance with the National Environmental Policy Act, and we believe a new Environmental Impact Statement is appropriate.

We will evaluate alternatives that meet the purpose and need for the project. The purpose is to operate the CVP and SWP for their authorized purposes: we need to comply with federal laws, including Section 8 of the Federal Reclamation Act for water rights issued under California Law; we need to satisfy our contractual obligations and agreements; and we intend to describe how we will implement CVP fish and wildlife project purposes.

CVP authorized purposes are flood control and navigation, water supply, fish and wildlife mitigation,

protection, restoration and enhancement, and power generation. We are also authorized to operate for water quality and for recreation.

So why do we do an EIS? Well, first, it's required under NEPA. But the primary purpose of EIS is to ensure agencies consider the environmental impacts of their actions in decision making. In the EIS, we provide a full and fair discussion of significant environmental impacts, and we inform decisionmakers and the public of reasonable alternatives that would avoid or minimize adverse impacts or that would enhance the quality of the human environment. Through the EIS process, we provide information for public review and comment.

So now we will talk about the scope.

We're proposing to cover the operation of CVP, which spans the Trinity in the north to the Friant-Kern Canal near Bakersfield in the south. We are also covering the operation of DWR facilities in the Delta. The project includes delivery of water to CVP and SWP service areas all the way to Southern California.

We're considering water operations, habitat restoration, facility improvements and new construction, conservation hatchery programs, scientific studies, and long-term monitoring. We anticipate actions for ESA-listed fish species such as chinook salmon, coho, sturgeon, and

Delta smelt. We are considering the conference process for longfin smelt.

For the next six slides, I'll walk through the geographic extent of the project by watershed.

First up is the Trinity River Division. A portion of the water from the Trinity River Basin is stored in Trinity Lake behind Trinity Dam and reregulated in Lewiston Lake behind Lewiston Dam. Water is released from Lewiston Dam to the Trinity River where it flows to the Klamath River.

The Trinity River Restoration Program implements a Year 2000 Record of Decision to restore Trinity River fisheries impacted by construction of the dams and impacted by the related diversions of the Trinity River Division.

Water from Lewiston Lake is also imported to the Central Valley through a tunnel and powerplant to Whiskeytown Reservoir on Clear Creek. From Clear Creek, water may be diverted to the Sacramento River upstream of Keswick Dam through Spring Creek or be released from Whiskeytown down Clear Creek.

Next is the Sacramento Basin. The Sacramento River is the longest river in the state. And a portion of the water from the Upper Sacramento River is stored in Shasta Lake and reregulated in Keswick Reservoir. Water in Shasta may be diverted at Shasta Dam or released into the

Sacramento River. Water may be diverted from the Sacramento River into the Tehama-Colusa and Corning Canals at the Red Bluff Pumping Plant. Shasta Lake is the largest reservoir in California.

The upper Sacramento River is unique in that it provides the only natural spawning for winter-run chinook salmon. Water temperature management is an important component of operations to support these endangered fish.

We are considering how to best coordinate with Sacramento River settlement contractors and senior water rights represented by settlement contracts.

Moving downstream, we have the American River Division. A portion of the water from the American River is stored in Folsom Reservoir and reregulated in Lake Natoma behind Nimbus Dam. Water in Folsom Reservoir serves the Greater Sacramento metropolitan area. And there are major municipal and industrial contracts here.

Water temperature management is also important for Folsom and we support steelhead and fall-run chinook salmon.

Next, moving to the San Joaquin Basin and starting from our southernmost CVP tributary, we have the Friant Division on the San Joaquin River. The San Joaquin River is the second longest river in California. A portion of the water from the Upper San Joaquin River is stored in

Millerton Reservoir behind Friant Dam. Water is diverted from Millerton into the Madera and Friant-Kern Canals or released into the San Joaquin River.

The San Joaquin River Restoration Program is a long-term effort to restore and maintain fish populations from Friant Dam to the confluence with the Merced River. The program seeks to reduce or avoid water supply impacts from restoration flows.

Our final tributary is the Stanislaus River in the Eastside Division. A portion of the water from the Stanislaus River is stored in New Melones Reservoir and then reregulated by Goodwin Dam. Goodwin Dam is operated under an agreement with local districts and is not a CVP facility.

Important species in the Stanislaus are listed steelhead and also fall-run chinook salmon which are not listed.

Finally, we reach the Delta. Both the Sacramento and San Joaquin Rivers flow to the Delta. The Delta provides a portion of the drinking water for 29 million people, serves an estimated $50-billion agricultural industry, and is home to hundreds of plant and animal species, including Delta smelt and longfin smelt.

As water moves down the mainstem of the Sacramento River, gates at the Delta Cross Channel are

operated for water quality, fish protection, and flood management.

The C.W. "Bill" Jones Pumping Plant at the southern end of the Delta lifts water into the Delta Mendota Canal where it is directly diverted or stored in San Luis Reservoir. Water from San Luis may be conveyed through the San Luis Canal or Pacheco Tunnel. The project area includes SWP facilities in the Delta, Cache Slough Complex, and Suisun Marsh, including the Harvey O'Banks Pumping Plant.

In addition to sharing water supply in San Luis Reservoir, the CVP and SWP conveyance facilities are connected by an intertie between the Delta Mendota Canal and the California Aqueduct after water is exported from the Delta.

Prior to water reaching the pumping plants, the Tracy Fish Collection Facility and the John E. Skinner Delta Fish Protective Facility salvage salmonids and other species.

That completes our project scope. I'll pass the screen back to Mary Lee for further details on the public comment portion of today's meeting. Thank you.

MS. KNECHT: Thanks Dave. Thanks for providing that overview.

Again, the purpose of today's meeting is to get

your input on the scope of the Environmental Impact Statement.

Some questions to think about.

What actions should be considered?

What environmental issues should be evaluated?

Are there any specific issues you wish to see addressed in the EIS?

After the comment period ends the comments will be compiled into a Scoping Report, which will be made available to the public on Reclamation's website.

Many of you may have submitted comments in 2019 during the last consultation process. Please note, you will need to submit comments again during this comment period for your input to be considered.

Regarding timing, all comments are due on or before March 30th. Reclamation will review and consider all comments received during scoping and will prepare a Scoping Report, anticipated to be ready in June of this year.

After the Draft EIS is completed, anticipated in 2023, Reclamation will publish a Notice of Availability and request public comments on the Draft EIS.

After the public comment period closes for the Draft EIS, Reclamation will develop the Final EIS, anticipated to be available to the public in 2024.

Reclamation will not make a decision or issue a Record of Decision sooner than 30 days after the Final EIS is released. We anticipates the issuance of a Record of Decision by 2024.

So again, before we get -- start taking comments, just a couple of guidelines.

We'll call on you when it is your turn. Please identify yourself and your affiliation. Please spell out your name to help with our transcription. You'll have about three minutes to provide feedback. And this is to allow everyone to have enough time to provide comments. And if time allows you may provide additional comments at the end. All comments are recorded and for attribution.

So for the public input discussion, Dave and I are joined by some of our Project Team members. Joining us are Jo Anna Beck, Armin Halston, Nick Bertrand, and Kristen Arend.

So with that, we are ready to take your comments. We are open for your input, so just go ahead and raise your hand if you have any comments. And Peter is going to help me with comments, with calling on folks.

MR. SOETH: Well, we had one, then lowered their hand. Remember, if have any comment, would like to make a comment, please raise your hand.

Regina Chichizola, please unmute yourself, and

you can turn your camera on.

MS. CHICHIZOLA: Hello. My name is Regina Chichizola. I am with the organization, Save California Salmon. I'm actually going to provide more extensive comments at a later meeting but I did have a couple of things I wanted to comment related to the process around this. I did comment in 2019, I guess it was, and I've actually commented on this process several times. And I have to say, the one-week notice on these hearings was not enough to actually let the public know about the hearings.

I live on the Klamath River, which is greatly impacted by Trinity River Operations. And our carryover storage is very low right now and your operations is the reason why. And I don't think a lot of our community even knows about these hearings because there was only a week's notice. I am putting the word out, you know, as much as a I can as, you know, a very small nonprofit.

But I just wanted to say that I, also, I feel like having a lot of these meetings during the day, instead of the evening, especially in areas where there are people who are concerned about carryover storage within the Shasta and Trinity Reservoirs, really makes it so the public can't participate. And it makes it feel like the process is not very sincere. And I think that's really important because you are dealing with millions of people's drinking water

and whether or not the salmon go extinct in our state. And I think a lot of people do care about that. But without much notice, without much outreach, it's pretty hard for people to get involved.

And I'm going to make more extensive comments on how I feel about, you know, the settlement contracts and the flows, and the issues with the salmon, and clean drinking water issues in the Delta at a later meeting. There are no meetings that are organized for my community, which is on the Trinity River, so I'm not sure which meeting I'm going to go to, but one of them in the evenings. And hopefully more of our community can show up for that. But maybe you should think about trying to set up a meeting in the evening for the native folks along the Trinity River that are impacted by this process.

And that would be all I have to say about this right now. And like I said, next -- probably next week, I will actually have my substantial comments to you.

MR. SOETH: Thank you.

Just a reminder, if you'd like to make a comment, please raise your hand and we'll call on you.

Mary Lee, we don't have anyone else raising their hands at this time.

MS. KNECHT: We were worried about too many hands, so with no additional hands raised, we thank you all

for participating in today's meeting. The next scoping meeting is scheduled for tomorrow from 5:30 to 7:30.

And just to note, you can -- even though the meetings were organized with different regions, you may participate in any of the six scoping meetings that we have planned.

So with that, thank you, again, for participating. We'll sign out now and take care. Thank you.

(The meeting concluded at 2:21 p.m.)

DEPARTMENT OF RECLAMATION

SCOPING MEETING

REMOTE VIA MICROSOFT TEAMS

WEDNESDAY, MARCH 9, 2022

5:30 P.M.

Reported by:

Martha Nelson

APPEARANCES

STAFF

Mary Lee Knecht, Public Affairs Officer

David Mooney, Bay-Delta Office Manager

Peter Soeth

PUBLIC COMMENT

LeMonie Hunt

Alicia Sherrin

Regina Chichizola, Save California Salmon

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P R O C E E D I N G S

5:31 p.m.

WEDNESDAY, MARCH 9, 2022

MS. KNECHT: Greetings and welcome to the Bureau of Reclamation's second scoping meeting for the re-initiation of consultation for the long-term operation of the Central Valley Project and State Water Project. We have six scoping meetings planned over two weeks, three this week and three next week. And thank you for joining us today.

My name is Mary Lee Knecht. I'm the Public Affairs Officer for the California-Great Basin Region. On behalf of our Reclamation Team, we extend our appreciation to you for attending today's meeting. We value your input into the scoping process.

Today, I'm joined by Dr. Dave Mooney, Manager of our Bay-Delta Office, and a few of our team members. We have Jo Anna Beck, Armin Halston, Josh Israel, and John Hannon, all from our Bay-Delta Office. We also joined by Peter Soeth and Chelsea Kennedy from the Commissioner's Office who are helping us navigate the Teams meeting.

If there are any elected officials or tribal members joining today, we will pause for any opening remarks you may have in just a few minutes. Dr. Mooney will then provide an overview of the project and scoping

process. We'll then open it up for public input, which is the primary reason we are here today.

So before we get started, just a few housekeeping items.

As we are sharing information in this online format today, we may experience glitches or temporary issues. Just bear with us and we'll work through any unforeseen issues as swiftly as possible.

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Dr. Mooney will be providing an overview of the project using a PowerPoint presentation. All of the meeting materials are also posted on our website, which is www.usbr.gov/mp/bdo, and that's like Mid-Pacific Bay-Delta Office, MP slash BDO.

Following the presentation, we will ask for your input. If you would like to share a comment, please use the raise-hand function in the upper righthand corner of your computer screen and smart phone. You can also press star five on your phone's touchtone pad to raise your hand.

We will call on participants in order and unmute you when it is your turn. Please announce your name and affiliation before sharing your feedback. And you'll have about three minutes to provide comments.

The purpose of today's scoping meeting is to encourage public input on the long-term operation of the Central Valley Project and State Water Project. We want to hear your insights and specific local information related to issues for the Environmental Impact Statement.

So now we'll pause to see if any elected officials or tribal members would like to make any opening remarks. If so, just use the raise-hand function. So not seeing any.

So with that, I'll turn it over to Dr. Dave Mooney for the presentation.

DR. MOONEY: Thank you, Mary Lee, and thank you to folks joining us today.

The CVP is a complex, multi-purpose network of dams, diversions, canals, powerplants and other facilities in California's Central Valley and Delta.

As a major economic asset, we provide water for the top agricultural counties in California, which is the nation's leading agricultural state. The Central Valley grows more than a third of the country's vegetables and two-thirds of the country's fruits and nuts.

The CVP also supplies water to cities and towns, including major urban centers in the Greater Sacramento and San Francisco Bay areas. And the operation is coordinated with the California Department of Water Resources who operates the State Water Project and serves water to nearly 30 million people.

To protect the environment, we operate to Water Quality Control Plans developed by the State Water Resources Control Board, and we consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to avoid jeopardizing the continued existence of, and to avoid adversely modifying the critical habitats of, species listed under the Federal Endangered Species Act. The services provide Reclamation and DWR with biological opinions that permit the operation of the CVP and SWP.

A February 18th, 2020 Record of Decision implements the consultation that resulted in biological opinions from the services in 2019.

This past September, Reclamation requested to reinitiate consultation due to anticipated modifications

that may cause effects to species not analyzed in the 2019 biological opinions. These modifications would address the review of the 2019 biological opinions required by Executive Order 13990 titled Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. Modifications would voluntarily reconcile CVP operating criteria with requirements of the State Water Project under the California Endangered Species Act.

So why are we here? We're here because Reclamation intends to modify the long-term operation of the CVP and SWP. This is a federal action that requires compliance with the National Environmental Policy Act, and we believe a new Environmental Impact Statement is appropriate.

We will evaluate alternatives that meet the purpose and need for the project. The purpose is to operate the CVP and SWP for their authorized purposes: we need to comply with federal laws, including Section 8 of the Federal Reclamation Act for water rights issued under California Law; we need to satisfy our contractual obligations and agreements; and we intend to describe how we will implement CVP fish and wildlife project purposes.

CVP authorized purposes are flood control and navigation, water supply, fish and wildlife mitigation, protection, restoration and enhancement, and power

generation. We are also authorized to operate for water quality and for recreation.

So why do we do an EIS? First, it's required by the National Environmental Policy Act. But the primary purpose is to ensure agencies consider the environmental impacts of their actions in decision making. In an EIS, we provide a full and fair discussion of significant environmental impacts, and we inform decisionmakers and the public of reasonable alternatives that would avoid or minimize adverse impacts or that would enhance the quality of the human environment. Through the EIS process, we provide information for public review and comment.

So now we will talk about the scope.

We're proposing to cover the operation of the CVP, which spans Trinity in the north to the end of the Friant-Kern Canal near Bakersfield in the south. We are also covering the operation of DWR facilities in the Delta. The project includes delivery of water to CVP and SWP service areas all the way to Southern California.

We're considering water operations, habitat restoration, facility improvements and new construction, conservation hatchery programs, scientific studies, and long-term monitoring. We anticipate actions for ESA-listed fish species such as chinook salmon, coho, sturgeon, and Delta smelt. We are considering the conference process for

longfin smelt.

For the next six slides, I'll walk through the geographic extent of the project by watershed.

First up is the Trinity River Division. A portion of the water from the Trinity River Basin is stored in Trinity Lake behind Trinity Dam and reregulated in Lewiston Lake behind Lewiston Dam. Water is released from Lewiston Dam to the Trinity River where it flows to the Klamath River.

The Trinity River Restoration Program implements a Year 2000 Record of Decision to restore Trinity River fisheries impacted by construction of the dams and related diversions of the Trinity River Division.

Water from Lewiston Lake is also imported to the Central Valley through a tunnel and powerplant to Whiskeytown Reservoir on Clear Creek. From Clear Creek, water may be diverted to the Sacramento River upstream of Keswick Dam through Spring Creek or be released from Whiskeytown Reservoir down Clear Creek.

Next is the Sacramento Basin. The Sacramento River is the longest river in the state. And a portion of the water from the Upper Sacramento River is stored in Shasta Lake and reregulated in Keswick Reservoir. Water in Shasta may be diverted at Shasta Dam or released into the Sacramento River. Water may be diverted from the

Sacramento River into the Tehama-Colusa and Corning Canals at the Red Bluff Pumping Plant. Shasta Lake is the largest reservoir in California.

The upper Sacramento River is unique in that it provides the only natural spawning for winter-run chinook salmon. Water temperature management is an important component of operations to support these endangered fish.

We are considering how to best coordinate with Sacramento River settlement contractors and the settlement of their claim senior water rights.

Moving downstream, we have the American River Division. A portion of the water from the American River is stored in Folsom Reservoir and reregulated in Lake Natoma behind Nimbus Dam. Water in Folsom Reservoir serves the Greater Sacramento metropolitan area. And there are major municipal and industrial contracts here.

Water temperature management is also an important component of Folsom operations and that supports steelhead and fall-run chinook salmon.

Next, moving to the San Joaquin Basin and starting from our southernmost CVP tributary, we have the Friant Division on the San Joaquin River. The San Joaquin River is the second longest river in California. A portion of the water from the Upper San Joaquin River is stored in Millerton Reservoir behind Friant Dam. Water is diverted

from Millerton into the Madera and the Friant-Kern Canals or released into the San Joaquin River.

The San Joaquin River Restoration Program is a long-term effort to restore and maintain fish populations from Friant Dam to the confluence with the Merced River. And the program seeks to reduce or avoid water supply impacts from restoration flows.

Our final tributary is the Stanislaus River in the Eastside Division. A portion of the water from the Stanislaus River is stored in New Melones Reservoir and then reregulated by Goodwin Dam. Goodwin Dam is operated under an agreement with local districts and is not a CVP facility.

Important species in the Stanislaus are listed steelhead, and also fall-run chinook salmon which are not listed.

Finally, we reach the Delta. Both the Sacramento and San Joaquin Rivers flow to the Delta. The Delta provides a portion of the drinking water for 29 million people. It serves an estimated $50-billion agricultural industry and is home to hundreds of plant and animal species, including Delta smelt and longfin smelt.

As water moves down the mainstem of the Sacramento River, gates at the Delta Cross Channel are operated for water quality, fish protection, and flood

management.

The C.W. "Bill" Jones Pumping Plant at the southern end of the Delta lifts water into the Delta Mendota Canal where it is directly diverted or stored in San Luis Reservoir. Water from San Luis may be conveyed through the San Luis Canal to the San Joaquin Valley or through the Pacheco Tunnel to the Santa Clara Valley. The project area includes SWP facilities in the Delta, the Cache Slough Complex, and the Suisun Marsh, including the Harvey O'Banks Pumping Plant.

In addition to sharing water supply in San Luis Reservoir, the CVP and SWP conveyance facilities are connected by an intertie between the Delta Mendota Canal and the California Aqueduct after water is exported from the Delta.

Prior to water reaching the pumping plants, the Tracy Fish Collection Facility and the John E. Skinner Delta Fish Protective Facility salvage salmonids and other species.

So this completes our project scope. I'll pass the screen back to Mary Lee for further details on the public comment portion of today's meeting. Thank you.

MS. KNECHT: Thanks for that overview, Dave.

Again, the purpose of today's meeting is to get your input on the scope of the Environmental Impact

Statement.

Some questions to think about.

What actions should be considered?

What environmental issues should be evaluated?

And are there any specific issues you wish to see addressed in the EIS?

After the comment period ends the comments will be compiled into a Scoping Report, which will be made available to the public on our website.

Many of you may have commented during the last consultation process in 2019. Please note, you will need to submit comments again during this comment period for your input to be considered.

Regarding timing, all comments are due by March 30th. Reclamation will review and consider all comments received during scoping and will prepare a Scoping Report. We anticipate the Scoping Report to be ready in June of this year.

After the Draft EIS, anticipated in 2023, will be developed and we'll publish a Notice of Availability and request public comments on the Draft EIS.

After the public comment period ends, Reclamation will develop the Final EIS, anticipated to be available to the public in 2024.

Reclamation will not make a decision or issue a

Record of Decision sooner than 30 days after the Final EIS is released. Reclamation anticipates the issuance of a Record of Decision by 2024.

So a couple of guidelines before we get into the verbal comments.

Peter will call on you when it's your turn. Please identify yourself and your affiliation. And please state and spell out your name to help with our transcription. You'll have about three minutes to provide feedback and, if time allows, you may provide additional comments at the end. All comments are recorded and for attribution.

So I think with that, we are ready to take comments. And again, just use the raise-hand function to let us know that you would like to provide some input.

MS. SOETH: We have one person raise their hand, LeMonie Hunt.

LeMonie, please unmute yourself and turn your camera on. LeMonie, please hit the unmute at the top of the -- top of the toolbar with the line through the microphone. LeMonie, are you able to unmute your phone?

MS. HUNT: Yes. Hi. Sorry. It wasn't letting me unmute on my end but it works now.

MS. SOETH: Okay.

MS. HUNT: So hello everyone. My name is LeMonie

Hunt. I am a Hupa tribal member and youth intern for Save California Salmon. Today, I'm advocating for the ensured protection of healthy river flows in the Northern California area.

The Central Valley Water Project must consider the Native American tribes along the Trinity, Klamath, and Shasta Rivers in the creation and maintenance of federal projects. The tribes, including the Hupa, Yurok, Karuk, and Wiyot Tribes are sovereign nations, meaning that under the United States Constitution, they have the right to self-governance and self-representation.

As a Hupa tribal member, I am speaking today to encourage that these rights are respected when conducting these federal projects concerning the Northern California rivers. Projects such as reservoirs or pumping plants that deplete the river of enough water for healthy -- for a healthy salmon run and drinking water is an infringement on the tribes' sovereignty.

As independent nations, tribes have the right to sustain their own economies to provide for their people. For Northern California tribes the economy is largely centered around the river and the salmon. Tribes rely on the salmon to feed their people, which is a vital element in maintaining their right to self-governance. But with these resources obstructed by federal projects, it results

in the loss of financial independence for tribal nations.

Northern California tribes are facing economic deprivation that is halting our progress as a people. As tribal people, we are in the process of recovering from years of some of the most devastating massacres and land exploitation in California. The active outside sources depriving tribes of the resources needed to sustain their governments is not respecting our constitutional rights as tribal people.

For these reasons, I am asking the Board to consider the welfare of the Northern California tribes first, which inherently means the welfare of the rivers.

Thank you for your time. My name is LeMonie Hunt. And that is all I have to say.

MS. SOETH: Okay.

MS. KNECHT: Thank you for your comment.

MS. SOETH: We have Alice Sherrin -- Alicia Sherrin.

Alicia, please unmute yourself and turn your camera on.

MS. SHERRIN: Unmute. I don’t have a camera available, it looks like, but unmuted.

My name is -- legal name is Alicia Sherrin. I'm a California licensed civil engineer. My License Number is C90595. And I would just like to jump on what LeMonie

already has said of the importance for these water resources for the Hupa tribal members and for many tribal members in Northern California and throughout our state, the importance of these water resources for their own livelihood, and not only for their livelihood but the livelihood of the salmon and the livelihood of our own ecosystems.

And on this, I actually want to just mention and draw out awareness to the Engineers Code of Ethics. I'll open up this really quickly. I'm in front of my screen here. And it has disappeared. Here it is.

In the Engineers Code of Ethics we describe engineering as an important and learned profession, and that engineers are expected to exhibit the highest standards or honesty and integrity. We recognize that engineering has a direct and vital impact on the quality of life for all people. Accordingly, the services provided by engineers require honesty, impartiality, fairness and equity, and must be dedicated to the protection of public health, safety, and welfare. Engineers must perform under a standard of professional behavior that requires adherence to the highest principles of ethical conduct.

Under the Professional Engineers Act -- sorry, under the Engineers Code of Ethics we are also obligated to act in accordance of protecting our environment -- sorry,

I'm trying to look through the exact number here -- under our professional obligations to -- oh, I need to bring this down.

The point of what I'm here to say is that as a civil engineer and as a water resources engineer, recognizing the necessity of our profession to act in a high standard of ethics. And this means every one of these water projects that goes through is required to be authorized or certified by a civil engineer licensed in the state of California.

And so I would like to encourage every one of those engineers working on these projects to really think deeply and feel deeply down into themselves if what they are going to certify is ethical and is benefitting all of life and benefitting all of humanity, not only the corporate interests who may be interested in having as much water for their commercial farms but, actually, all of the humans who live in the far northern parts of these watersheds where the water is being taken from.

And that will conclude my comment at this time, just to hold all of the engineers that work on these projects to the highest standard of ethics within the code that manages our license and our profession, and to not allow ourselves to be directed by corporate interests but rather by the benefit of the people and the salmon.

Thank you.

MS. KNECHT: Thank you.

MS. SOETH: Once again, if you'd like to make a statement, please raise your hand. If you are on the phone, you can hit star five and that will raise your hand and we'll unmute you. Are there any other people who would like to make a comment today?

Mary Lee, I'll turn it back to you. Oh, someone just raised their hand. Just a second.

Regina Chichizola, please unmute yourself and turn your camera on. Just a second here. There you go. You should be able to unmute yourself.

MS. CHICHIZOLA: Hello. I did comment yesterday, just that I thought that this wasn't well advertised. So today, I will be giving my comments that are actually more substantial.

My name is Regina Chichizola and I'm with the organization Save California Salmon. I live on the Klamath River in Karuk territory, very close to where the Trinity River goes into the Klamath River.

I wanted to comment today that I feel like it is critically important that the Bureau takes actions to save the winter-run salmon from extinction and to make sure that the salmon in the Klamath River are -- start rebounding. We critically, in the Klamath River, rely on the Trinity

River Water. And we are requesting protections for carryover storage in the Trinity Reservoir in order to have water for releases for salmon. And it is the Bureau's obligation to protect that water under -- as tribal trust responsibility.

We're also requesting carryover storage protections for Shasta Reservoir and other reservoirs, not only for tribal trust responsibility but because, as you said, the drinking water of over 20 million Californians rely upon this, as do several runs of salmon species survival.

We feel like it is critically necessary for you to look at your settlement contractors and your contracts with the settlement contractors, which include rice farmers that use more water than the City of L.A. last year and, also, drained our reservoirs to the point where we're looking at maybe not having enough water to provide electricity for cities this year, or drinking water supplies.

It is completely possible for farmers not to farm during years of extremely drought. And it is necessary or else you're going to drive species into extinction, violate your tribal trust responsibilities, and possibly leave whole cities without any drinking water.

It's time for the Bureau to change the way it

does business. We've dealt with fish kill after fish kill under the Trump Water Plan. And carryover storage for these reservoirs are critical, as is bringing winter-run salmon back above the Shasta Dam and protecting spring-run salmon.

So I really hope that you take these comments seriously.

And I also hope that you do a much better job of outreaching to impacted communities in the future because with a week's notice to let people know about how important these hearings were was not enough. And I know of hundreds and hundreds of people who were involved the last time that you did this re-consultation process and those people don't know this is happening this time around which makes it seem like you're trying to make this plan under a veil of secrecy.

So I just, really, I know it's hard in this new world to get the word out to people, but I really hope that you do a better job in the future making sure people know about this because there are millions of people whose -- millions of people and whole runs of salmon that are relying on what you do with these operations.

Thank you for the opportunity to comment. I think I'm within my three minutes. And hopefully you'll see more participation next week.

Thank you.

MS. KNECHT: Thank you.

MS. SOETH: Thank you. Does anyone else have -- would anyone else like to make a comment?

Mary Lee, I'll turn it back to you.

MS. KNECHT: Okay. Well, if there's no other hands, thank you all for participating in tonight's meeting. The next scoping meeting is scheduled for tomorrow from 2:00 to 4:00.

Thank you again for participating. We'll sign out now and take care. Thank you.

(The meeting concluded at 5:59 p.m.)

DEPARTMENT OF RECLAMATION

SCOPING MEETING

REMOTE VIA MICROSOFT TEAMS

THURSDAY, MARCH 10, 2022

2:00 P.M.

Reported by:

Martha Nelson

APPEARANCES

STAFF

Mary Lee Knecht, Public Affairs Officer

David Mooney, Bay-Delta Office Manager

Peter Soeth

PUBLIC COMMENT

(No public comment was received)

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P R O C E E D I N G S

2:01 p.m.

THURSDAY, MARCH 10, 2022

MS. KNECHT: Well, good afternoon and greeting. Welcome to the Bureau of Reclamation's third scoping meeting for the re-initiation of consultation for the long-term operation of the Central Valley Project and State Water Project. We have six scoping meetings planned, three this week and three next week. And thank you for joining us today.

My name is Mary Lee Knecht. I am the Public Affairs Officer for the California-Great Basin Region. On behalf of our Reclamation Team, we extend our appreciation to you for attending today's meeting. We value your input into the scoping process.

Today, I'm joined by Dr. Dave Mooney, who is the Manager of our Bay-Delta Office, and a few of our team members. We have Erwin Van Nieuwenhuyse, Carolyn Bragg, and Jo Anna Beck. We also joined by Peter Soeth and Chelsea Kennedy from the Commissioner's Office who are helping with Teams meeting management.

If there are any elected officials or tribal members joining today, we'll pause for any opening remarks you may have in just a few minutes. Dr. Mooney will then

provide an overview of the project and scoping process. And then we'll open it up for public input, which is the primary reason we are all here today.

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We will call on participants in order and unmute you when it is your turn. And you'll have about three minutes to provide comments.

The purpose of today's scoping meeting is to encourage the public input on the long-term operation of the Central Valley Project and State Water Project. We want to hear your insights and specific local information related to issues for the Environmental Impact Statement.

So we'll pause now. I don't believe any elected officials or tribal members are on but just double checking. If on hands are raised, we'll move on..

So with that, I'll now turn it over to Dr. Dave Mooney for the presentation.

DR. MOONEY: Thank you, Mary Lee, and thank you for those joining us today for public scoping.

The CVP is a complex, multi-purpose network of dams, diversions, canals, powerplants and other facilities in California's Central Valley and Delta.

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In addition to sharing water supply in San Luis Reservoir, the CVP and SWP conveyance facilities are connected by the Delta Mendota Canal California Aqueduct Intertie after water is exported from the Delta.

Prior to water reaching the pumping plants, the Tracy Fish Collection Facility and the John E. Skinner Delta Fish Protective Facility salvage salmonids and other species.

That completes our project scope. I will pass the screen back to Mary Lee for further details on the public comment portion of today's meeting. Thank you.

MS. KNECHT: Thanks for that overview, Dave.

Again, the purpose of today's meeting is to get

your input on the scope of the Environmental Impact Statement.

Some questions to think about.

What actions should be considered?

What environmental issues should be evaluated?

Are there any specific issues you wish to see addressed in the EIS?

After the comment period ends the comments will be compiled into a Scoping Report, which will be made available to the public on our website.

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Regarding timing, all comments are due by March 30th. Reclamation will then review and consider all comments received during scoping and prepare a Scoping Report which should be read in June.

The next step is to develop the Draft Environmental Impact Statement. A Notice of Availability will go out when the draft is ready sometime next year. And will, again, request public comments on that Draft EIS.

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Reclamation will not make a decision or issue a Record of Decision sooner than 30 days after the Final EIS is released. Reclamation anticipates the issuance of a Record of Decision by 2024.

So, again, just a couple of guidelines to provide verbal comments.

Peter will call on you when it is your turn. Please identify yourself and your affiliation. If you could please spell out your name to help with our transcription, that would be appreciated. You'll have about three minutes to provide feedback. And I'm sure we'll have plenty of time for comments. All comments are recorded and for attribution.

So with that, are ready to dive in to get your input. You can do so by raising your hand or pressing star five on your touchtone pad on your phone.

MS. SOETH: Once again, if you'd like to ask a question, please raise your hand. You can do that by clicking the hand icon on the toolbar as indicated on the PowerPoint slide.

(Pause)

MS. SOETH: Are there any people who'd like to make a statement? Please raise your hand.

Mary Lee, I'll turn it back to you.

MS. KNECHT: Well, again, the meeting materials

are on our website. If you want to give it some more thought, we do have three scoping meetings scheduled for next week, beginning on Tuesday, Tuesday, Wednesday, Thursday of next week.

So last call for any comments. If not, feel free to join us next week. And, again, you may provide written comments by email or mail and they're due on March 30th.

So thank you all for participating, and we'll sign out now, so thank you again for joining. Take care.

(The meeting concluded at 2:18 p.m.)

DEPARTMENT OF RECLAMATION

SCOPING MEETING

REMOTE VIA MICROSOFT TEAMS

TUESDAY, MARCH 15, 2022

5:30 P.M.

Reported by:

Martha Nelson

APPEARANCES

STAFF

Mary Lee Knecht, Public Affairs Officer

David Mooney, Bay-Delta Office Manager

Carolyn Bragg, Natural Resources Specialist

Chelsea Kennedy, Public Affairs Specialist

PUBLIC COMMENT

(No public comment was received)

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P R O C E E D I N G S

5:31 p.m.

TUESDAY, MARCH 15, 2022

MS. KNECHT: Hi everyone. It looks like we have a small attendance tonight. So it's 5:31. We'll go ahead and get started.

Good evening. Welcome to the Bureau of Reclamation's fourth of six scoping meetings for the re-initiation of consultation for the long-term operation of the Central Valley Project and State Water Project. Thank you for joining us today.

My name is Mary Lee Knecht. I am the Public Affairs Officer for the California-Great Basin Region. On behalf of our Reclamation Team, we extend our appreciation to you for attending today's meeting. We value your input into the scoping process.

Today, I'm joined by Dr. Dave Mooney, Manager of our Bay-Delta Office, and a few of our team members. We have Armin Halston, Cindy Meyer, and Carolyn Bragg. We're also joined by Peter Soeth and Chelsea Kennedy from the Commissioner's Office who are helping with Teams meeting facilitation.

If there are -- I don't think there's any elected officials on but we will pause in just a minute if someone joins us if they'd like to make a few opening remarks. Dr.

Mooney will then provide an overview of the project and the scoping process. And then we'll then open it up for public input, which is the primary reason we are here today.

So before we get started, just a few housekeeping items.

If you're having issues seeing or hearing the presentation, we recommend using the Microsoft Teams app on your computer or smart phone versus in your web browser.

This is a Microsoft Teams event. It's being recorded so we may accurately capture any your comments we receive. All comments are on the record and for attribution. If you wish not to be recorded you may still provide written comments by mail or email. All comments are subject to the Freedom of Information Act.

And then for those of you using screens, you may turn on the closed captioning by choosing that option from the upper righthand corner of your screen.

Okay, so Dave Mooney will be providing an overview of the project using a PowerPoint presentation. The meeting materials are also posted on our website, and that's www.usbr.gov/mp/bdo.

Following the presentation, we'll ask for public input. If you would like to share a comment just use the raise-hand function in the upper righthand corner of your computer screen and on your smart phone. You can also

press star five on your phone's touchtone pad.

We will call on participants in order. And please, announce your name and affiliation before sharing your comment. And you'll have about three minutes to provide comments.

So the meeting purpose. The purpose of today's scoping meeting is to encourage public input on the long-term operation of the Central Valley Project and State Water Project. We want to hear your insights and specific local information related to issues for the Environmental Impact Statement.

So we'll pause. I don't believe there's any elected officials on. Raise your hand if I'm wrong. I don't think so.

So with that, I will now turn it over to Dr. Dave Mooney for the presentation.

Thank you for joining us today.

DR. MOONEY: I appreciate those who came tonight to hear our presentation and provide comments.

The CVP is a complex, multi-purpose network of dams, diversions, canals, powerplants, and other facilities in California's Central Valley and Delta.

As a major economic asset, we provide water for the top agricultural counties in California, which is the nation's leading agricultural state. The Central Valley

grows more than a third of the country's vegetables and two-thirds of the country's fruits and nuts.

The CVP also supplies water to cities and towns, including major urban centers in the Greater Sacramento and San Francisco Bay areas. The operation is coordinated with the California Department of Water Resources who operates the State Water Project to serve water to nearly 30 million people.

To protect the environment, we operate to Water Quality Control Plans developed by the State Water Resources Control Board, and we consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to avoid jeopardizing the continued existence of, and to avoid adversely modifying the critical habitats of, species listed under the Federal Endangered Species Act. The services provide Reclamation and DWR with biological opinions that permit the operation of the CVP and the SWP.

A February 18th, 2020 Record of Decision implements the consultation that resulted in biological opinions from the services in 2019.

This past September, Reclamation requested to reinitiate consultation due to anticipated modifications that may cause effects to species not analyzed in the 2019 biological opinions. These modifications would address the review of the 2019 biological opinions required by

Executive Order 13990 titled Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. Modifications would voluntarily reconcile CVP operating criteria with requirements of the State Water Project under the California Endangered Species Act.

So why are we here? We're here because Reclamation intends to modify the long-term operation of the CVP and SWP. This is a federal action that requires compliance with the National Environmental Policy Act, and we believe a new Environmental Impact Statement is appropriate.

We will evaluate alternatives that meet the purpose and need for the project. The purpose is to operate the CVP and SWP for their authorized purposes: we need to comply with federal laws, including Section 8 of the Federal Reclamation Act for water rights issued under California Law; we need to satisfy our contractual obligations and agreements; and we intend to describe how we will implement CVP fish and wildlife project purposes.

CVP authorized purposes are flood control and navigation, water supply, fish and wildlife mitigation, protection, restoration and enhancement, and power generation. We are also authorized to operate for water quality and for recreation.

So why do we do an EIS? Well, first, it's

required by the National Environmental Policy Act. And the primary purpose is to ensure agencies consider the environmental impacts of their actions in decision making. In an EIS, we provide a full and fair discussion of significant environmental impacts, and we inform decisionmakers and the public of reasonable alternatives that would avoid or minimize adverse effects or that would enhance the quality of the human environment. Through the EIS process, we provide information for public review and comment.

So now we'll talk about the scope.

So we're proposing to cover the operation of the CVP, which spans Trinity in the north to the end of the Friant-Kern Canal near Bakersfield in the south. We are also covering the operation of DWR facilities in the Delta. The project includes delivery of water to CVP and SWP service areas all the way to Southern California.

We're considering water operations, habitat restoration, facility improvements and new construction, conservation and hatchery programs, scientific studies, and long-term monitoring. We anticipate actions for ESA-listed fish species such as chinook salmon, coho, sturgeon, and Delta smelt. We are considering the conference process for longfin smelt.

For the next six slides, I'll walk through the

geographic extent of the project by watershed.

First is the Trinity River Division. A portion of the water from the Trinity River Basin is stored in Trinity Lake behind Trinity Dam and reregulated in Lewiston Lake behind Lewiston Dam. Water is released from Lewiston Dam to the Trinity River, where it flows into Klamath River.

The Trinity River Restoration Program implements a Year 2000 Record of Decision to restore Trinity River fisheries impacted by construction of the dams and related diversions of the Trinity River Division.

Water from Lewiston Lake is also imported to the Central Valley through a tunnel and powerplant to Whiskeytown Reservoir on Clear Creek. From Clear Creek, water may be diverted to the Sacramento River upstream of Keswick Dam through Spring Creek or be released from Whiskeytown Reservoir down Clear Creek.

Next is the Sacramento Basin. The Sacramento River is the longest river in the state. And a portion of the water from the Upper Sacramento River is stored in Shasta Lake and reregulated in Keswick Reservoir. Water in Shasta may be diverted at Shasta Dam or released to the Sacramento River. Water may be diverted from the Sacramento River into the Tehama-Colusa and Corning Canals at the Red Bluff Pumping Plant. Shasta Lake is the largest

reservoir in California.

The upper Sacramento River is unique in that it provides the only natural spawning for winter-run chinook salmon. Water temperature management is an important component of operations at Shasta to support these endangered fish.

We are considering how to best coordinate with Sacramento River settlement contractors and the settlement of their claimed senior water rights.

Moving downstream, we have the American River Division. A portion of the water from the American River is stored in Folsom Reservoir and reregulated in Lake Natoma behind Nimbus Dam. Water in Folsom Reservoir serves the Greater Sacramento metropolitan area. And there are major municipal and industrial contracts here.

Water temperature management is an important component of Folsom operations to support both steelhead and fall-run chinook salmon.

Next, moving to the San Joaquin Basin and starting from our southernmost CVP tributary, we have the Friant Division on the San Joaquin River. The San Joaquin River is the second longest river in California. A portion of the water from the Upper San Joaquin River is stored in Millerton Reservoir behind Friant Dam. Water is diverted from Millerton into the Madera and Friant-Kern Canals or

released into the San Joaquin River.

The San Joaquin River Restoration Program is a long-term effort to restore and maintain fish populations from Friant Dam to the confluence with the Merced River. The program seeks to reduce or avoid water supply impacts from restoration flows.

Our final tributary is the Stanislaus River on the Eastside Division. A portion of the water from the Stanislaus River is stored in New Melones Reservoir and then reregulated by Goodwin Dam. Goodwin Dam is operated under an agreement with local districts and is not a CVP facility.

Important species in the Stanislaus are listed steelhead, and also fall-run chinook salmon which are not listed.

Finally, we reach the Delta. Both the Sacramento and San Joaquin Rivers flow to the Delta. The Delta provides a portion of the drinking water for 29 million people. It serves an estimated $50-billion agricultural industry and is home to hundreds of plant and animal species, including Delta smelt and longfin smelt.

As water moves down the mainstem of the Sacramento River, gates at the Delta Cross Channel are operated for water quality, fish protection, and flood management.

The C.W. "Bill" Jones Pumping Plant at the southern end of the Delta lifts water into the Delta Mendota Canal where it is directly diverted or stored in San Luis Reservoir. Water from San Luis may be conveyed through the San Luis Canal to the San Joaquin Valley or through the Pacheco Tunnel to the Santa Clara Valley. The project area includes SWP facilities in the Delta, Cache Slough Complex and Suisun Marsh, including the Harvey O'Banks Pumping Plant.

In addition to sharing water supply and San Luis Reservoir, the CVP and SWP conveyance facilities are connected by the Delta Mendota Canal California Aqueduct Intertie to the California Aqueduct.

Prior to water reaching the pumping plants, the Tracy Fish Collection Facility and the John E. Skinner Delta Fish Protective Facility salvage salmonids and other species.

So that completes our project scope. I will pass the screen back to Mary Lee for further details on the public comment portion of today's meeting. Thank you.

MS. BRAGG: Mary Lee, you're muted.

Dr. MOONEY: Oh, yeah. I think you're muted.

MS. KNECHT: First time I've done that.

Thanks for the overview, Dave.

Again, the purpose of today's meeting is to get

your input on the scope of the Environmental Impact Statement.

Some questions to think about.

What actions should be considered?

What environmental issues should be evaluated?

And are there any specific issues you would like to see addressed in the EIS?

After the comment period ends the comments will be compiled into a Scoping Report, which will be made available to the public on Reclamation's website.

Many of you may have submitted comments in 2019 during the last consultation process. Please note, you will need to submit comments again during this comment period for your input to be considered.

Regarding timing, all comments are due by March 30th. Reclamation will review and consider all comments received during scoping and prepare a Scoping Report which should be ready in June.

The next step is to develop the Draft Environmental Impact Statement. A Notice of Availability will go out when the draft is ready, sometime next year, and we will request public comments on the Draft EIS.

All of those comments will be considered for the Final EIS which we anticipate to be available to the public in 2024.

Reclamation will not make a decision or issue a Record of Decision sooner than 30 days after the Final EIS is released. Reclamation anticipates the issuance of a Record of Decision by 2024.

Again, a couple of guidelines to provide verbal comments.

Peter will call on you when it is your turn. Please identify yourself and your affiliation. If you would please spell out your name, that would help with the transcription.

So with that, I think we're ready for any comments that you may have. You can press star five if you're on the phone. And, otherwise, just use the raise-hand function.

I know it's a small group tonight. But if anyone has comments, feel free to jump in.

MS. BRAGG: A reminder to raise your hand if you'd like to submit a comment.

(Pause)

MS. KNECHT: Okay. This is our last evening, meaning we have two more meetings after this evening, that's tomorrow, tomorrow is Wednesday, from 2:00 to 4:00, and Thursday 2:00 to 4:00.

And then just a reminder, comments are due on March 30th.

And if there's no comments this evening, you can feel free to join us tomorrow or Thursday or send them in via mail or email.

So maybe one last request for comments from anyone? I don't think there's anyone on the phone, right, Chelsea?

MS. KENNEDY: No, there is not.

MS. KNECHT: Okay. Well, we appreciate you joining us. Again, the presentation is online on the website. Again, two more scoping meetings, tomorrow and Thursday, 2:00 to 4:00. Comments due March 30th.

And we appreciate your time. Thank you for joining us this evening. Take care.

(The meeting concluded at 5:47 p.m.)

DEPARTMENT OF RECLAMATION

SCOPING MEETING

REMOTE VIA MICROSOFT TEAMS

WEDNESDAY, MARCH 16, 2022

2:00 P.M.

Reported by:

Martha Nelson

APPEARANCES

STAFF

Mary Lee Knecht, Public Affairs Officer

David Mooney, Bay-Delta Office Manager

Chelsea Kennedy, Public Affairs Specialist

PUBLIC COMMENT

Stephanie Gordon, USEPA

Robert Franklin

Karl Seckel, Municipal Water District of Orange County

Heinrich Albert

Johnny Gailey, Delta View Water Association

Devin Aviles, Agri-World Cooperative

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P R O C E E D I N G S

2:01 p.m.

WEDNESDAY, MARCH 16, 2022

MS. KNECHT: Good afternoon and welcome to the Bureau of Reclamation's fifth of six scoping meetings for the re-initiation of consultation for the long-term operation of the Central Valley Project and State Water Project. Thank you for joining us today.

My name is Mary Lee Knecht. I am the Public Affairs Officer for the California-Great Basin Region. On behalf of our Reclamation Team, we extend our appreciation to you for attending today's meeting. We value your input into the scoping process.

Today, I'm joined by Dr. Dave Mooney, Manager of our Bay-Delta Office, and a few of our project team members. They include Dr. Cindy Meyer, Ian Smith, Suzanne Manugian, and Armin Halston. We're also joined by Chelsea Kennedy and Peter Soeth from the Commissioner's Office who are helping with Team meeting facilitation.

If there are any elected officials or tribal members joining today, we will pause in just a few moments for any opening remarks you may have. Dr. Mooney will then provide an overview of the project and the scoping process. We'll then open it up for public input, which is the primary reason we are all here today.

So before we get started, just a few housekeeping items.

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So to provide comment, Dr. Mooney will be providing an overview of the project using a PowerPoint presentation. The meeting materials are also posted on the website, and that's at www.usbr.gov/mp/bdo.

Following the presentation, we will ask for public input. If you would like to share a comment, use the raise-hand function in the upper righthand corner of your computer screen and smart phone. If you're not familiar with Teams, you can -- it's literally in the upper righthand corner and there's a hand logo, emoji, that you

just press on and that will raise your hand. And then we will call on participants in order. If you have called into the meeting, just press star five on your phone's touchtone pad to raise hand.

When you are providing comments, please, announce your name and affiliation before sharing your comment. And you'll have about three minutes to provide comments.

So the meeting purpose. The purpose of today's scoping meeting is to encourage public input on the long-term operation of the Central Valley Project and State Water Project. We want to hear your insights and specific local information related to issues for the Environmental Impact Statement.

So we'll pause real quick to see if there's any elected officials or tribal members that have joined that would like to say a few words. If so, just raise your hand.

And seeing none, so with that, I'll turn it over to Dr. Dave Mooney for the presentation.

DR. MOONEY: Thank you, Mary Lee. And thank you to folks for joining us today.

The CVP is a complex, multi-purpose network of dams, diversions, canals, powerplants, and other facilities in California's Central Valley and the Delta.

As a major economic asset, we provide water for

the top agricultural counties in California, which is the nation's leading agricultural state. The Central Valley grows more than a third of the country's vegetables and two-thirds of the country's fruits and nuts.

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So now we'll talk about the scope.

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In this effort, we're considering water operations, habitat restoration, facility improvements and new construction, conservation and hatchery programs, scientific studies, and long-term monitoring. We

anticipate actions for ESA-listed fish species such as chinook salmon, coho, sturgeon, and Delta smelt. And we are considering the conference process for longfin smelt.

For the next six slides, I'll walk through the geographic extent of the project by watershed.

First up is the Trinity River Division. A portion of the water from the Trinity River Basin is stored in Trinity Lake behind Trinity Dam and reregulated in Lewiston Lake behind Lewiston Dam. Water is released from Lewiston Dam to the Trinity River, where it flows into Klamath River.

The Trinity River Restoration Program implements a Year 2000 Record of Decision to restore Trinity River fisheries impacted by construction of the dams and impacted by the related diversions of the Trinity River Division.

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We are also considering how to best coordinate with Sacramento River settlement contractors and the settlement of their claimed senior water rights.

Moving downstream, we have the American River Division. A portion of the water from the American River is stored in Folsom Reservoir and reregulated in Lake Natoma behind Nimbus Dam. Water in Folsom Reservoir serves the Greater Sacramento metropolitan area. And there are major municipal and industrial contracts here.

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So this completes our project scope. I will pass the screen back to Mary Lee for further details on the public comment portion of today's meeting. Thank you.

MS. KNECHT: Thank you for that overview, Dave.

Again, the purpose of today's meeting is to get your input on the scope of the Environmental Impact Statement.

So some questions to think about.

What actions should be considered?

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And are there any specific issues you would like to see addressed in the EIS?

After the comment period ends the comments will be compiled into a Scoping Report, which will be made available to the public on Reclamation's website.

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in 2024.

Reclamation will not make a decision or issue a Record of Decision sooner than 30 days after the Final EIS is released. Reclamation anticipates the issuance of a Record of Decision by 2024.

So, again, a couple of guidelines to provide verbal comments.

We will call on you when it is your turn. Please identify yourself and your affiliation. Please state and spell out your name to help with the transcription.

Just a side note that the chat function is turned off. So if you do want to make a comment or let us know anything, just raise your hand, again, using the hand emoji at the righthand corner of your screen.

So with that, we'll pause from our speaking and open it up to the floor for your comments.

(Pause)

MS. KNECHT: Any comments at all from anyone? It looks like Stephanie. Oh.

MS. KENNEDY: I think we had one but they put their hand down. Yes.

MS. KNECHT: You got it, Chelsea?

MS. KENNEDY: Yup.

MS. GORDON: Hi. I was wondering what the time frame for the project is? I noticed that in the Scoping

Notice it said until 2040 for some of the climate change, but how long would the new bi ops be written for, like 20 years longer, shorter?

Thanks.

MS. KENNEDY: What was your full name, Stephanie?

MS. GORDON: My name is Stephanie Gordon and I'm with the USEPA in the NEPA Review Office.

DR. MOONEY: Hey Stephanie. I think we're hoping to get input on what during to consider. Within the NOI, we had selected 2040 as a date that we're thinking about, in case that helps folks formulate their comments. Biological opinion does not have a specific end date. We look at it in terms of what effects are or are not covered and what changes may occur to the baseline that would help us understand our project operation.

MS. GORDON: Thank you.

MS. KNECHT: Any other comments? It looks like Robert Franklin has a comment.

MS. KENNEDY: Robert, you can now speak.

DR. MOONEY: Robert, if you can verify that you're unmuted, please?

MR. FRANKLIN: How is that working?

MS. KNECHT: That works.

DR. MOONEY: Thank you.

MR. FRANKLIN: My only affiliation as of the time

of the call is that I'm just a private consultant. And I've been involved in all of this since the late '80s.

I am wondering, within the scope under consideration, what might be important to address in the Klamath River below the confluence of the Trinity River where there is direct impact, direct influence on listed fishes and a host of other species that are tribal trust/public trust consideration? There's a long-term -- there's a plan to manage Lower Klamath, primarily through release of flows down the Trinity River from Lewiston in order to prevent a repeat of the fish kill that we saw in 20 -- 2002.

So I didn't hear anything about that. It's an important connection here.

Thanks.

MS. KNECHT: Thank you for your comment.

DR. MOONEY: I think we are looking to collect comments on consideration for the Trinity River Division. So if there are those types of resource consideration, it would be very beneficial for you to continue adding to that, in addition to your comments today.

MS. KNECHT: Thank you, again.

Karl, we'll get you unmuted.

MS. KENNEDY: Carl, you can now unmute yourself.

MR. SECKEL: Thank you. And I'm hoping --

actually, you need my name, Karl, last name Seckel, S, as in Sam, -E-C-K-E-L. I'm an elected Director with the Municipal Water District of Orange County, part of the Metropolitan family. And I hope questions are okay for this. I'm just trying to plug into the process and see how things are going, so I had three questions that might help me and others in this process.

One is what options will be considered in the scoping process for conveying water either around or through the Delta? It seems to me that's the most complex part of the whole arena. So that was question number one.

Question number two, with respect to salinity repulsion and long-term operations, it seems to me that a permanent salinity barrier of some type could be erected but I don't -- I've never heard any technical analysis done on that. And it just seems like it would make the whole system a little bit more operable if there were a permanent barrier in the Cartina Straits (phonetic) area, something like that.

And then the third question I had relates to water rights. It's unclear to me how the CVP and State Water Project water rights are being considered, and is there a joint obligation to meet the environmental needs or is one senior over the other?

So those are the three initial questions I had.

And, once again, thank you all for having the scoping meetings. I'm finding the process interesting. I did expect quite a bit more questions, so without anybody speaking up you kind of flushed me out.

So anyway, thanks for holding these.

MS. KNECHT: Thank you.

DR. MOONEY: I think when we're in scoping it's really about gathering what the different considerations should be and what the different alternatives should be, so your questions are right in line with scoping and asking us to consider about the conveyance, asking us to consider a salinity barrier, and asking us to consider water rights.

MS. KNECHT: Thanks again.

Any other comments? We'll get you unmuted, Albert.

MS. KENNEDY: Albert, you can now unmute yourself.

MR. ALBERT: Thank you. My name is Heinrich Albert. I'm speaking as a California resident and citizen.

I just, in terms of scoping, I just want to emphasize the importance of trying to do a better job of protecting our fish and the other wildlife that depends on our rivers from California. You know, the really very worrisome decline of so many species, and especially last year, the huge percentage of mortality of juvenile salmon

below Shasta Dam is really worrisome.

And so I urge you, in formulating this, a new plan of operations, that we put a much stronger emphasis on protecting those species, which we have done such a poor job of protecting up to this point.

Thank you.

MS. KNECHT: Thank you for your comment.

It looks like Robert might have another comment, Chelsea.

MS. KENNEDY: Robert, you can unmute yourself now.

MR. FRANKLIN: Thank you. I had a couple of things that I thought of there.

First off has to do with the process underway. There's scoping. There's input from the public and others over this stretch of time. And then is there a report back to the public, et cetera, with any opportunity to, potentially, adjust what is in the Scoping Report where something has perhaps been misheard, misinterpreted by the, you know, folks working on that end of it?

The other thing I'd like to know something about is if there has already been a selection of the consulting and cooperating agencies, I would appreciate knowing/finding out who -- which agencies those are.

DR. MOONEY: I think there is an opportunity with

our -- we release a public Draft Environmental Impact Statement that provides the ability to correct, adjust, and provide other considerations. And we have not selected a consultant yet to support us in this effort.

MS. KNECHT: Thanks for your questions, Robert.

Anyone else have any comments? Johnny Gailey.

MS. KENNEDY: Johnny, you can unmute yourself now. Did you have a comment, Johnny?

DR. MOONEY: Johnny, are you able to see the unmute option?

MR. GAILEY: Now I can unmute myself. It was there the whole time. Sorry.

MS. KNECHT: Great.

MR. GAILEY: So I'm not sure if this is the -- if it's appropriate but I'm not sure if, you know, if we're looking at global food security and the Central Valley's contribution to that, if that impacts the decisions that are made in these -- in this process? But the chronic lowering of groundwater levels and the implementation of SGMA are going to cause several hundred thousand acres of farmland to be fallowed if we don't consider increasing the amount of water that's able to be diverted and understanding that we need to consider the impacts to the environment, also.

DR. MOONEY: Thank you. And you do not have to

but if you'd like to identify your affiliation, please just hit unmute to do so.

MR. GAILEY: Yeah. My name, it's Johnny Gailey, so it's J-O-H-N-N-Y, last name is G-A-I-L-E-Y, and I'm with Delta View Water Association, a group of wide-area growers.

DR. MOONEY: Thank you.

MS. KNECHT: Thank you for your comment.

Any other comments?

MS. KENNEDY: Robert Franklin, you can unmute yourself.

MR. FRANKLIN: Thank you. David, thank you for your response to my question but it was answering a question I didn't have.

I'm asking if there's an opportunity to review and correct the Scoping Report, not the -- I understand a Draft EIS down the line and that's, I'm told, next year, not 2022, 2023 that we might anticipate that. But now we've got the scoping underway. Could we see a draft of a Scoping Report and have any opportunity?

Thanks.

DR. MOONEY: Yeah, we don't have a formal process for the Scoping Report. We will make it available in June. And if there's something in there that you believe we got incorrect or mistaken, please, do reach out and communicate

and we will either update or provide an errata.

MS. KENNEDY: Devin, you can now unmute yourself and make your comment.

MR. AVILES: Thank you. My name is Devin Aviles. It's spelled D-E-V-I-N, last name is Aviles, A, as in apple, -V, as in Victor, -I-L-E-S. The company I represent is Agri-World Cooperative. We are a farm management company that farms several different properties for a lot of different entities and are very much impacted by what's happening now with the State Groundwater Management Act, or SGMA. We are fully reliant on groundwater to continue growing our crops. And as you all know, that's a dire situation, as Johnny Gailey just referenced.

But to the other gentleman's comment about the death and dying of species, what I would like you, as a Bureau, to look at is how many million acre feet have been used out of the various reservoirs to try to protect? It's been a while and that's why you're going to see thousands and hundreds of thousands of acres go fallow. And all of us have dealt with the last two years of COVID and we've learned about supply chain issues. If anything we learned, we should not rely on sourcing major parts of our supply chain outside of the United States of America.

You guys know that that the Central Valley is the breadbasket of the world. A lot of crops that are grown

here cannot be grown anywhere else in the nation or in the world. So I really think you have to look at -- when you're looking at re-consultation of this biological opinion, I respectfully ask all of you to take this into consideration.

Thank you for my time.

MS. KNECHT: Thank you for your comment, Devin.

Any other comments or questions, just raise your hand. We'll give it another minute or so.

(Pause)

MS. KNECHT: We do have one more scoping meeting planned. That's for tomorrow, same time, from 2:00 to 4:00. Again, comments are due by March 30th. And you can call, email, mail them in, or attend tomorrow's scoping meeting.

Should we do a last call?

Well, with that, we thank you very much for participating today. Again, due -- comments due March 30th. Feel free to join us tomorrow if you think of something else between now and then. We'll start again at two o'clock tomorrow. And reach out if you have any questions or need additional information.

Thanks again for joining us. Take care and have a good rest of your day. Thank you.

(The meeting concluded at 2:36 p.m.)

DEPARTMENT OF RECLAMATION

SCOPING MEETING

REMOTE VIA MICROSOFT TEAMS

THURSDAY, MARCH 17, 2022

2:00 P.M.

Reported by:

Martha Nelson

APPEARANCES

STAFF

Mary Lee Knecht, Public Affairs Officer

David Mooney, Bay-Delta Office Manager

Todd Plain

PUBLIC COMMENT

Carrie Tully, Save California Salmon

Kasil Willie, Save California Salmon

Kyle de Juilio

INDEX

P R O C E E D I N G S

2:01 p.m.

THURSDAY, MARCH 15, 2022

MS. KNECHT: Hi everyone. Good afternoon. I think everyone's in from the lobby, so hello.

Welcome. Welcome to Bureau of Reclamation's sixth scoping meeting for the re-initiation of consultation for the long-term operation of the Central Valley Project and State Water Project. Thank you all for joining us today.

My name is Mary Lee Knecht. I am the Public Affairs Officer for the California-Great Basin Region. On behalf of our Reclamation Team, we extend our appreciation to you for attending today's meeting. We value your input into the scoping process.

Today, I'm joined by Dr. Dave Mooney, Manager of our Bay-Delta Office, and a few of our project team members. We have Dr. Cindy Meyer joining us today, along with Jo Anna Beck, Kristen Aaron (phonetic), and Brian Mahardja, sorry if I butchered that. And we also have a couple of other folks helping us with meeting management, so thank you all.

If there are any elected officials or tribal members joining today, we will pause for any opening remarks you may have in just a few minutes. Dr. Mooney

will then provide an overview of the project and the scoping process. We'll then open it up for public input, which is the primary reason we are here today.

So before we get started, just a few housekeeping items.

If you're having issues seeing or hearing the presentation, we recommend using the Microsoft Teams app on your computer or your smart phone versus in your web browser.

This is a Microsoft Teams event. It's being recorded so we may accurately capture your comments. All remarks are on the record and for attribution. If you wish not to be recorded you may still provide comments by mail or email. And all comments are subject to the Freedom of Information Act.

For those of you using screens, you may turn on closed captioning by choosing that option from the menu in the righthand corner of your screen.

Dr. Mooney will be providing an overview of the project using a PowerPoint presentation. All of the meeting materials are also posted on our website at www.usbr.gov/mp/bdo.

Following the presentation, we'll ask for public input. If you would like to share a comment you can see the righthand -- in the righthand corner of your screen

there's a little hand emoji. Just press on that to raise hand and we will call on you when it is your turn.

Please, announce your name and affiliation before sharing your comment. And you'll have about three minutes to provide comments.

Meeting purpose. The purpose of today's scoping meeting is to encourage public input on the long-term operation of the Central Valley Project and State Water Project. We want to hear your insights and specific local information related to issues for the Environmental Impact Statement.

So now we'll pause to see if there's any elected officials or tribal representatives that would like to make any opening remarks. If so, just raise your hand. So not seeing any.

With that, I'll turn it over now to Dr. Dave Mooney for the presentation.

DR. MOONEY: Thank you, Mary Lee, and thanks to everybody else for joining us here today.

The CVP is a complex, multi-purpose network of dams, diversions, canals, powerplants, and other facilities in California's Central Valley and Delta.

As a major economic asset, we provide water for the top agricultural counties in California, which is the nation's leading agricultural state. The Central Valley

grows more than a third of the country's vegetables and two-thirds of the country's fruits and nuts.

The CVP also supplies water to cities and towns, including major urban centers in the Greater Sacramento and San Francisco Bay areas. The operation is coordinated with the California Department of Water Resources who operates the State Water Project to serve water to nearly 30 million people.

To protect the environment, we operate to Water Quality Control Plans developed by the State Water Resources Control Board, and we consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to avoid jeopardizing the continued existence of, and to avoid adversely modifying the critical habitats of, species listed under the Federal Endangered Species Act. The services provide Reclamation and DWR with biological opinions that permit the operation of the CVP and SWP.

A February 18th, 2020 Record of Decision implements the consultation that resulted in biological opinions from the services in 2019.

This past September, Reclamation requested to reinitiate consultation due to anticipated modifications that may cause effects to species not analyzed in the 2019 biological opinions. These modifications would address the review of the 2019 biological opinions that are required by

Executive Order 13990 titled Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. The modifications would also voluntarily reconcile CVP operating criteria with requirements of the State Water Project under the California Endangered Species Act.

So why are we here? We're here because Reclamation intends to modify the long-term operation of the CVP and SWP. This is a federal action that requires compliance with the National Environmental Policy Act, and we believe a new Environmental Impact Statement is appropriate.

We will evaluate alternatives that meet the purpose and need for the project. The purpose is to operate the CVP and the SWP for their authorized purposes: we need to comply with federal laws, including Section 8 of the Federal Reclamation Act for water rights issued under California Law; we need to satisfy our contractual obligations and agreements; and we intend to describe how we will implement CVP fish and wildlife project purposes.

CVP authorized purposes are flood control and navigation, water supply, fish and wildlife mitigation, protection, restoration and enhancement, and power generation. We are also authorized to operate for water quality and for recreation.

So why do we do an Environmental Impact

Statement? Well, first, it's required by the National Environmental Policy Act. The primary purpose is to ensure agencies consider the environmental impacts of their actions in decision making. In an EIS, we provide the full and fair discussion of significant environmental impacts, and we inform decisionmakers and the public of reasonable alternatives that would avoid or minimize adverse effects or that would enhance the quality of the human environment. Through the EIS process, we provide information for public review and comment.

Now we will talk about the scope.

We're proposing to cover the operation of the CVP, which spans Trinity in the north to the end of the Friant-Kern Canal near Bakersfield in the south. We are also covering the operation of DWR facilities in the Delta. The project includes delivery of water to CVP and SWP service areas all the way to Southern California.

We're considering water operations, habitat restoration, facility improvements and new construction, conservation and hatchery programs, scientific studies, and long-term monitoring. We anticipate actions for Endangered Species Act-listed fish species such as chinook salmon, coho, sturgeon, and Delta smelt. We are considering the conference process for longfin smelt.

For the next six slides, I'll walk through the

geographic extent of the project by watershed.

First up is the Trinity River Division. A portion of the water from the Trinity River Basin is stored in Trinity Lake behind Trinity Dam and reregulated in Lewiston Lake behind Lewiston Dam. Water is released from Lewiston Dam to the Trinity River, where it flows into Klamath River.

The Trinity River Restoration Program implements a Year 2000 Record of Decision to restore Trinity River fisheries impacted by construction of the dams and impacted by related diversions of the Trinity River Division.

Water from Lewiston Lake is also imported to the Central Valley through a tunnel and powerplant to Whiskeytown Reservoir on Clear Creek. From Clear Creek, water may be diverted to the Sacramento River upstream of Keswick Dam through Spring Creek or water may be released from Whiskeytown Reservoir down Clear Creek.

Next is the Sacramento Basin. The Sacramento River is the longest river in the state. And a portion of the water from the Upper Sacramento is stored in Shasta Lake and reregulated in Keswick Reservoir. Water in Shasta may be diverted at Shasta Dam or released to the Sacramento River. Water may be diverted from the Sacramento River into the Tehama-Colusa and Corning Canals at the Red Bluff Power [sic] Plant. Shasta Lake is the largest reservoir in

California.

The upper Sacramento River is unique in that it provides the only natural spawning for winter-run chinook salmon. Water temperature management is an important component of operations at Shasta to support these endangered fish.

We are considering how to best coordinate with Sacramento River settlement contractors and the settlement of their claimed senior water rights.

Moving downstream, we have the American River Division. A portion of the water from the American River is stored in Folsom Reservoir and reregulated in Lake Natoma behind Nimbus Dam. Water in Folsom serves the Greater Sacramento metropolitan area. And there are major municipal and industrial contracts here.

Water temperature management is also very important to the American River and is a component of Folsom operations to support steelhead and fall-run chinook salmon.

Next, moving to the San Joaquin Basin and starting from our southernmost CVP tributary, we have the Friant Division on the San Joaquin River. The San Joaquin River is the second longest river in California. A portion of the water from the Upper San Joaquin River is stored in Millerton Reservoir behind Friant Dam. Water is diverted

by Millerton into the Madera and Friant-Kern Canals or released into the San Joaquin River.

The San Joaquin River Restoration Program is a long-term effort to restore and maintain fish populations from Friant Dam to the confluence with the Merced River. The program also seeks to reduce or avoid water supply impacts from restoration flows.

Our final tributary is the Stanislaus River on the Eastside Division. A portion of the water from the Stanislaus River is stored in New Melones Reservoir and then reregulated by Goodwin Dam. Goodwin Dam is operated under an agreement with local districts and is not a CVP facility.

The important species in the Stanislaus are listed steelhead, and also fall-run chinook salmon which are not listed.

So, finally, we reach the Delta. Both the San Joaquin and Sacramento Rivers flow into the Delta. The Delta provides a portion of the drinking water for 29 million people. It serves an estimated $50-billion agricultural industry and it is home to hundreds of plant and animal species, including Delta smelt and longfin smelt.

As water moves down the mainstem of the Sacramento River, gates at the Delta Cross Channel are

operated for water quality, fish protection, and flood management.

The C.W. "Bill" Jones Pumping Plant at the southern end of the Delta lifts water into the Delta Mendota Canal where it is directly diverted or stored in San Luis Reservoir. Water from San Luis may be conveyed through the San Luis Canal to the San Joaquin Valley or through the Pacheco Tunnel to the Santa Clara Valley. The project area includes SWP facilities in the Delta, Cache Slough Complex and Suisun Marsh, including the Harvey O'Banks Pumping Plant.

In addition to sharing water supply and San Luis Reservoir, the CVP and SWP conveyance facilities are connected by an intertie between the Delta Mendota Canal and the California Aqueduct.

Prior to water reaching the pumping plants, the Tracy Fish Collection Facility and the John E. Skinner Delta Fish Protective Facility salvage salmonids and other species.

This completes our project scope. I'll pass the screen back to Mary Lee for further details on the public comment portion of today's meeting. Thank you.

MS. KNECHT: Thanks for that overview, Dave.

Again, the purpose of today's meeting is to get your input on the scope of the Environmental Impact

Statement.

So some questions to think about.

What actions should be considered?

What environmental issues should be evaluated?

And are there any specific issues you wish to see addressed in the EIS?

After the comment period ends the comments will be compiled into a Scoping Report, which will be made available to the public on Reclamation's website.

Many of you may have submitted comments in 2019 during the last consultation process. Please note, you will need to submit comments again during this comment period for your input to be considered.

Regarding timing, all comments are due by March 30th. And Reclamation will review and consider all comments received prepare a Scoping Report. And that should be ready in June.

The next step is to develop the Draft Environmental Impact Statement. A Notice of Availability will go out when the draft is ready, sometime next year. We will request public comments on the Draft EIS.

All of those comments will be considered for the Final EIS which we anticipate to be available to the public in 2024.

Reclamation will not make a decision or issue a

Record of Decision sooner than 30 days after the Final EIS is released. Reclamation anticipates the issuance of a Record of Decision by 2024.

So providing comments today, just a couple of reminders.

We'll call on you when it's your turn. Please identify yourself and your affiliation. Please spell your name to help with our transcription. And again, just use the raise-hand function in your righthand screen or press star five on your touchtone pad on your telephone.

So with that, we are ready for your comments. If anyone has any comments, just raise your hand.

Seeing Carrie. We'll work on getting your mike ready.

Todd, did you have -- are you -- did you get Carrie ready?

MR. PLAIN: Yes. I was -- my mike was off.

Carrie, please unmute yourself and state and spell your name, and affiliation if you wish.

MS. TULLY: Hi. Good afternoon. My name is Carrie Tully, C-A-R-R-I-E T-U-L-L-Y. I am the Organizational Development Director with Save California Salmon. And I have kind of an unusual request, at least I feel like it's unusual.

I was trying to join the meeting yesterday and I

was bumped off, and then I could not rejoin. And so I intended on making two separate comments yesterday and today. And given the fact that there haven't been a lot of people commenting, I wonder if you would give me the opportunity to present both, which would be put me over three minutes but they would be separate comments?

MS. KNECHT: Dave's in charge and he says that's okay.

DR. MOONEY: Yeah. Would it be okay if we took your first comment, go to the next person who has their hand raised, and come back to you?

MS. TULLY: That's totally fine. I wanted -- I would like to start with my comment that, specifically, is not regarding the topic that we are here to discuss but more of like the format of the meetings themselves. And I have several notes that I'm going to read based on many people's input based on things that I've been hearing down the line since these hearings began. And being that I had this experience yesterday, I can speak to some of this myself.

But I just wanted to like let you guys know that people have been having lots of trouble getting into these meetings using Google Meets -- or Microsoft Meets [sic]. And then are, in addition, participating specifically with the raising-hands function, and so that's been an issue.

The lack of notice for these hearings has been highly detrimental to many people that I work with and that we are affiliated with, including tribes, but other stakeholders as well. It's been really challenging to get people that we have that we normally would be able to outreach to, to get to participate, which I've been hearing that any kind of surprise at the lack of participation is because of the lack of notice for the hearings.

In addition, the locations that these meetings were set to represent don't include many of the regions that are represented by many of these interested and affected people, including tribes. And many people even thought that because they had designated like locations assigned to the different meetings, that they weren't allowed to attend the other meetings. And so a lot of people haven't been showing up because of that reason, as well.

While I definitely appreciate that you're offering two different time periods, the 2:00 p.m. and the 5:30, it's still challenging to make both of those times work, parents in particular. I'm speaking partially for myself, like a lot of other people that I know, I'm still traveling at 5:30 when I pick up my child from school. But, also, many kids get picked up at 2:15. And so if you had more variability with this many hearing options, if you

could do more in the morning, and just vary it some more, so that people would have the opportunity to come, we would really appreciate that.

And then the other issue that I've been finding that is concerning is that the meetings have been scheduled for 2:00 to 4:00 or 5:30 to 7:30. But when people are trying to get on at like 5:30, say -- or I'm sorry, at like six o'clock when the meeting starts at 5:30, if the meetings starts at 5:30 and they try to jump on at 6:00 because that's when they're able to, that line has already been ended. And that -- you know, if you're stating that you have a meeting from a certain time to a certain time, like at least have the line open so people are able to make those comments during that time.

And so that is my -- those are my -- the items that I wanted to bring up specifically regarding the hearings themselves. And then when you guys can circle back to me, I have comments regarding the issues, as well. And thank you for giving me the opportunity to speak twice.

MS. KNECHT: Thanks for that feedback, Carrie.

MR. PLAIN: All right, Willie, welcome. Please state your name and spell your name, and identify your affiliation if you wish.

DR. MOONEY: I think you need to unmute yourself first if you are able to. So is it Kasil Willie? Are you

able to find the microphone button and unmute yourself?

MR. PLAIN: Make him a presenter. All right, we're going to try something.

MS. KNECHT: I just tried that, Todd, so --

MR. PLAIN: Okay.

MS. WILLIE: Hello?

MS. KNECHT: There you go.

MS. WILLIE: Okay. It wouldn't let me unmute. I am Kasil Willie, K-A-I-L, last name Willie, W-I-L-L-I-E. I am the Staff Attorney for Save California Salmon.

Firstly, I want to address the current -- that current water operations have severely damaged the salmon population, specifically the winter-run chinook salmon. This is clearly evidenced by the recent mortality rates of the endangered winter-run chinook.

In 2020 and 2021, respectively, 89 percent and 97 percent of all winter-run that returned for spawning died in the short stretch of the Sacramento River between the Keswick Dam and the Red Bluff Diversion Dam. That means that last year only three percent of breeding winter-run chinook survived. And it does not bode well for the population this year or the next few years. And that was just with the winter-run chinook operation which is currently listed as endangered.

Since the lifespan of winter-run chinook is three

years, and spring-run is one to five years, the need to provide enough water for them cannot be put off much longer.

With the 2019 biological opinion neglecting these delicate species, it's put them at further risk, as seen with the mortality rates in winter-run salmon. Therefore, moving forward, more extreme measures will likely be necessary to rectify the situation and ensure the survival of these keystone species.

It is my hope that these critical years where are fish populations have suffered and lacked protection are fully taken into consideration in the EIS.

And it is also my hope that we can prevent the extinction of these species from our state and federal allocations of water and higher priority given to these delicate species.

Additionally, (indiscernible) due to climate change, as we've all seen, (indiscernible) has become a more regular occurrence within the state, causing many of the state to (indiscernible). I recognize that climate change and drought affects everyone, including agricultural interests. However, try to find another interest that depends on fresh water as much salmon and other fish species.

As we see (indiscernible) allocation of our

shared water resources needs to be reprioritized in order to protect the (indiscernible) fish species and river ecosystems throughout the state.

Lastly, I want to highlight the importance of salmon and other river species to the indigenous people of California. Long before the development of modern-day water rights, tribes across the state depended on salmon for food (indiscernible) and ceremonies. Given no fault of their own, however, California's tribes' rights and access to the rivers and the species they once depended on have been taken away over time. But the cultural significance of rivers and salmon have been carried on for generations and those traditions still go on today.

And it is my hope that the salmon's importance as a cultural resource is properly acknowledged in the EIS. And input from all tribes that traditionally inhabited the local areas of the water projects is sought out.

Thank you.

MS. KNECHT: Thank you for your comment.

MR. PLAIN: All right. Thank you.

Next up is Carrie. Please unmute yourself and state your name and spell it, as well, and identify your affiliation if you wish. Thank you.

MS. TULLY: Hi again. It's Carrie Tully, C-A-R-R-I-E, last name T-U-L-L-Y, and I'm the

Organizational Development Director with Save California Salmon. Let me just make my comments really quickly. Thank you, again, for giving me the opportunity to speak two times. I really appreciate it.

So our salmon are facing extinction. Since the Trump biological opinions were adopted in 2019, we've seen a devastating mortality of native fish species. Current Central Valley and State Water Project operations have killed almost all the winter-run and much of the spring- and fall-run salmon in the Sacramento River and Bay-Delta. According to NRDC's March 11th blog post,

> "The Trump Administration's biological opinions were the result of scientific misconduct, political interference, and bias. The end result is nothing short of a plan for extinction that is playing out before our eyes."

Let me be clear, this is not simply the result of a drought. As the State Water Board wrote earlier this spring,

> "Although the current violations are exacerbated by the extreme dry conditions, they are, in part, the result of the overallocation of project water during dry conditions."

The dams that make these projects possible want to block access to water that is cold enough for the

survival of anadromous fish at any life stage, including spring- and winter-run chinook, Central Valley steelhead, and longfin and Delta smelt. This has caused near elimination of spawning and rearing habitat for these species, species which are not only integral to Northern California tribes but, also, to Northern California residents as they are keystone species without which entire waterways and ecosystems will be permanently altered.

The Central Valley and State Water Project continue to prioritize allocating millions of acre feet of water to their contractors over protecting our native fish. Both the State Water Resources Control Board and the Reclamation have the authority to reduce these deliveries and provide enough cold water for salmon, yet both have failed to do so year after year.

I must ask, at what point did humans decide that we're okay with being responsible for destroying another species so that we could grow almonds and rice in the desert? Clearly, this doesn't benefit the planet, which is increasingly notifying us of her fury for what we've done to her. Do you continue to tell yourselves that by mechanizing and controlling nature that we can find a way out of this deadly situation that we have brought upon ourselves?

Our native fish can't wait three years for these

projects to be operated pursuant to scientifically-credible biological opinions during one of the hottest and driest years of the last century.

Again, I quote the previously mentioned NRDC article.

"If increased outflows are needed and cannot be met under SOS contracts, those contracts may need to be revisited to ensure consistency with the ESA. We must prioritize fish over agricultural now. We must reform the ancient and racist water rights system that over-allocates water to big agricultural while stealing it from tribes and fish. We must recognize the responsibility that we have to protect endangered species, species that have deep cultural ties to the tribes of Northern California."

I cannot think of a better time to make these changes. The time is now. You have the ability to make these changes so, please, make the right choice.

Thank you.

MS. KNECHT: Thank you for your comment, Carrie.

MR. PLAIN: All right. Thank you.

Next up, Kyle. Would you please go ahead and unmute yourself and state and spell your name for the record? And identify your affiliation if you wish.

MR. DE JULIO: Hello. My name is Kyle dee Julio, K-Y-L-E D-E J-U-I-L-I-O. And I am providing comment on

behalf of the Yurok tribe.

I work for the tribe as a Senior Fisheries Biologist of their Trinity River Program. The Yurok tribe has relied upon the fisheries of the Trinity River since time immemorial to nourish their environment, people, and culture. In more recent times, they have cooperated with the federal government to restore the river and its fisheries from the damage that was done by the implementation of the Trinity River Division of the Central Valley Project.

However, continued drought and reckless over-allocation and diversion of water resources from the Trinity Basin have continued to degrade and impact habitat conditions needed to support migrating, holding and spawning salmon, as well as their incubating eggs.

Reclamation lacks coverage for take from continued operation of the TRD for listed Southern Oregon and Northern California coastal coho salmon under the Endangered Species Act. The 2000 biological opinion on the TRD sets the limit on take of (indiscernible) coho at zero but take has occurred from the operations of the TRD due to low surge conditions in Trinity Reservoir, causing release of water insufficiently cold to protect spawning and incubating salmon in the fall of 2021.

There is also a complete lack of analysis and

disclosure of impacts of the TRD on two additional species listed under the Endangered Species Act since 2000, Southern Resident killer whale and southern distinct population segment of (indiscernible). We are encouraging that Reclamation intends to reconsult with NOAA fisheries under the ESA. However, there is an immediate need for interim emergency measures to protect ESA-listed (indiscernible) salmon from foreseeable and excessive take due to limited inflow and cold water resources in the Trinity River Division.

Reclamation should implement emergency measures during the reinitiating consultation. Reclamation must take every action possible to provide for the preservation and propagation of Trinity River fish and wildlife by curtailing trans-basin diversions and by bypassing power production.

We ask that you analyze and implement measures to meet colder temperature requirements of coho salmon during reproduction in November and December annually.

The Scoping Notice of Intent includes, in the purpose and need, meeting the requirements of the Reclamation Act and other federal law. The 1955 Trinity River Act constitutes such a law that must be met by the proposed ESA action and preferred alternative analyzed under NEPA.

The Notice of Intent further acknowledges that the proposed action must protect Indian trust assets in the Trinity River. Accordingly, proposed action for the ESA and preferred alternative for the EIS must ensure in-basin fish and wildlife needs are met before any water is identified as surplus and available for out-of-basin diversion.

To meet these requirements of the diversion the pending re-consultation on operations of the TRD must remain separate and be completed prior to that of the larger CVP. This will ensure that environmental impacts of reservoir management and water quality and quantity released to the river in the Trinity River Basin can be considered independent of the impacts in the Sacramento River.

he resulting surplus Trinity River water, after all in-basin needs are satisfied, can then be considered for possible trans-basin diversion inputs to the evaluation of environmental impacts of the larger CVP to the Sacramento River system and its ESA-listed species. No impacts in the Sacramento Basin should be attributed to any lack of diversion from the Trinity River as more water is made available by the authorizing congressional act unless it is surplussed to the in-basin needs of the Trinity.

We ask that Reclamation assess a multiyear

drought and impending climate change impacts of proposed actions, explicitly addressing these through protective storage measures that reduce risk of environmental impacts in the Trinity River from extended drought. We ask that you comply with both of the provisions of the 1955 Trinity River Act.

We also ask that you include a long-term plan to replace, upgrade or remove infrastructure identified to pose a risk to preservation, propagation or recovery of fish and wildlife in the Trinity River, and that the Yurok tribe, who holds federally-recognized fishing rights, be granted co-lead status for environmental documents related to storage, diversion and flow actions on the Trinity.

While we understand the complex situation that Reclamation and regulatory agencies are in regarding competing interests between two basins that are connected by this project -- yeah, they are -- these are the exact reasons that the provisions were included in the authorizing 1955 Act. We ask that you take extraordinary measures to use the existing capabilities of the TRD to save our federally-recognized trust fisheries' resources during this trying water year.

Thank you.

MS. KNECHT: Thank you for your comment, Kyle.

Anyone else have any input, comments?

(Pause)

MS. KNECHT: Just use the raise-hand function, or star five for anyone on the phone, to raise hand.

Just a reminder, we are taking comments through March 30th. You can telephone them in, you can mail them in, email them. And we will stay online for a little bit longer if you have any comments to share today.

(Pause)

MS. KNECHT: Well, if there's no further comments today, Dave, do you want any parting remarks or --

DR. MOONEY: I appreciate everybody calling in. If there are others out there who would like to make comments, we do have the opportunity to submit them by email or mail, so please encourage them to reach out through those mechanisms.

MS. KNECHT: Okay. And comments are due by March 30th.

We appreciate everyone's time and participation in these scoping meetings.

If there's no additional hands, thank you again, and have a great rest of your day. Thank you for joining. And we will logout in just a moment. Thank you. This concludes the meeting.

(The meeting concluded at 2:39 p.m.)