SAN FRANCISCO BAYKEEPER®

October 15, 2021

Ryan Heacock
Santa Clara Valley Water District
5750 Almaden Expressway
Santa Clara, CA, 95118

Submitted via email to fahce@valleywater.org

Comments of San Francisco Baykeeper on Santa Clara Valley Water District's Draft Programmatic Environmental Impact Report for the Fisheries and Aquatic Habitat Collaborative Effort, dated June 30, 2021

Dear Mr. Heacock,

Thank you for the opportunity to comment on Santa Clara Valley Water District's ("Valley Water's") Draft Programmatic Environmental Impact Report (EIR) for the Fisheries and Aquatic Habitat Collaborative Effort (FAHCE). The project, as proposed, implements a Fish Habitat Restoration Plan (FHRP), and includes habitat restoration measures specified in a 2003 FAHCE Settlement Agreement intended to resolve a water rights complaint filed with the State Water Resources Control Board. It includes both flow measures (reservoir re-operations rule curves) and non-flow measures such as fish barrier remediation, and measures to increase spawning and rearing habitat.

San Francisco Baykeeper ("Baykeeper") is a non-profit public benefit corporation organized under the laws of the State of California. Baykeeper submits these comments on behalf of its approximately 5,000 members and supporters who live and/or recreate in and around the San Francisco Bay Area. Baykeeper's mission is to defend San Francisco Bay from the biggest threats and hold polluters and government agencies accountable to create healthier communities and help wildlife thrive. Our team of scientists and lawyers investigate pollution via aerial and on-the-water patrols, strengthen regulations through policy advocacy, and enforce environmental laws on behalf of the public.

I. INTRODUCTION

Valley Water has not been managing its waterways to protect habitat values for fish and wildlife. Instead, Valley Water's management has been focused on maximizing drinking water production at the cost of all other values. For instance, Valley Water routinely brings temperatures and flow rates to levels that are unsuitable for fish, despite the presence of protected species such as Central California Coast Steelhead trout and Central Valley fall-run Chinook salmon.

Fish populations in Santa Clara County's Stevens Creek, Guadalupe River, and their tributaries are not in good condition. Despite many years of implementing various habitat improvement projects, including projects intended to reduce or limit barriers to adult and juvenile migration, fish in these waterways are frequently subjected to river/creek flow conditions that are inadequate to maintain viable populations, much less populations that can contribute to local and regional fisheries. Fish and wildlife-related beneficial uses identified in the San Francisco Bay Basin Plan are not being maintained in these creeks or the estuary they feed. The EIR describes all of these deficiencies and more, but the Proposed Project described in the EIR is patently inadequate to remedy flow-related impairment of fish populations in these waterways.

Valley Water's reservoir operations cause significant harm to Santa Clara County's rivers, creeks, and streams. For example, as noted in the EIR, the Coastal Multispecies Final Recovery Plan (NMFS 2016) found that "…all life stages of [Central California Coast] Steelhead are limited by impaired conditions within Stevens Creek and the Guadalupe River watershed. To prevent the extinction of [Central California Coast] Steelhead and shift their trajectory toward recovery, the Recovery Plan (NMFS 2016) indicates that the following conditions be met: clean water, sufficient stream flows, absence of barriers to migration, suitable habitats, and limited harvest." (EIR at 3-176). The Proposed Project fails to deliver these conditions.

The bottom line is that Valley Water's appropriations negatively impact habitat values in its watershed.[1] Thus, these appropriations contribute to reduced populations and distribution of Steelhead Trout and other fish within the watershed as a whole. Valley Water must therefore target sustainable conditions that keep fish populations in good condition. The EIR fails to do so.

II. LEGAL BACKGROUND

a. The Fisheries and Aquatic Habitat Collaborative Effort (FAHCE)

Holders of licenses to use waters of the State of California, such as Valley Water, do not have unlimited authority to use the water allocated in their water rights licenses if that use adversely impacts "public trust resources."[2] Public trust resources include the natural resources of living streams such as fish and waterfowl. Pursuant to these principles, a formal Water Rights Complaint was filed with the State Water Resources Control Board ("State Board") in 1996 by attorneys for the

[1] For example, habitat values are degraded upstream of Valley Water's Alamitos Drop Structure. The Drop Structure and its flashboard dams elevate temperatures, impede fish migration, and degrade riparian vegetation, channel forms, and substrates.

[2] Ample legal precedent supports the curtailment of water rights in order to prevent illegal diversions, protect other water rights, protect the environment, and prevent waste and unreasonable use. (*See, e.g., Stanford Vina Ranch Irr. District v. State Water Resources Control Board*, 50 Cal. App. 5th 976 (2020) (upheld the State Board curtailment to protect salmon during 2014-2015 drought); *Light v. State Water Resources Control Board*, 226 Cal.App.4th 1463 (2014) (upheld agency action curtailing diversions for frost protection to protect salmon); *Millview County Water District v. State Water Resources Control Board*, 229 Cal.App.4th 879 (2014) (upheld cease and desist order to stop illegal diversion); *Young v. State Water Resources Control Board*, 219 Cal.App.4th 397 (2013) (same); *United States v. State Water Resources Control Board*, 182 Cal.App. 3d 82 (1986) (Constitutional prohibition on waste and unreasonable use applies to all water rights holders: "[N]o water rights are inviolable; all water rights are subject to governmental regulation"); *National Audubon Society v. Superior Court*, 33 Cal. 3d 419, 658 (1983) (public trust doctrine applies to water rights granted under state law).)

Natural Heritage Institute – acting on behalf of their client the Guadalupe Coyote Resources Conservation District – alleging that Valley Water was operating its facilities in a way that damaged Steelhead Trout, a threatened species under the Endangered Species Act, as well as other aquatic species. More specifically, the complaint alleged that Valley Water's use of its water right licenses on Coyote Creek, the Guadalupe River, and Stevens Creek ("Three Creeks") degraded fish, wildlife, water quality, and other beneficial uses in violation of the California Constitution, California's Water Code, California's Fish and Game Code, and the public trust doctrine. The Complaint requested action to develop a plan to restore these species to a healthy condition. A settlement agreement addressing these claims was reached in 2003.[3] This agreement, called the FAHCE (pronounced "face") Agreement and described in section 6700 of the Water Code, was supposed to remove barriers to fish migration, provide summer rearing habitat, and improve spawning conditions in the Three Creeks.

The FAHCE Agreement, however, has never been implemented. For the past 18 years, Valley Water has repeatedly stated that it is taking steps to mitigate the impacts of its reservoir operations on fish populations, but it has taken no measurable operational steps to do so. Finally, in 2015, Valley Water began to prepare a Fish Habitat Restoration Plan, targeting 2018 for completion with a Final Environmental Impact Report by December. After additional delay, Valley Water released this EIR on June 30, 2021. This EIR, however, does not provide the remedies promised under the FAHCE Agreement, instead providing primarily for further delay.

The EIR describes and analyzes flow and physical habitat modifications collectively intended to implement the FAHCE Agreement. The FAHCE Notice of Preparation ("FAHCE NOP 2015"), for instance, states that "the District is proposing these operational commitments for instream flow requirements as the basis to amend its water rights licenses and address elements of the California Water Code 1707, CA Fish and Game Code 5937 and public trust doctrine issues needed to resolve the water rights complaint." (FAHCE NOP 2015, at 3.) This EIR already represents significant delay, and promises continued delay and an indefinite time horizon.

b. California Environmental Quality Act

One of CEQA's primary purposes is to make sure that information is available to the public in a clear, concise, and understandable manner. CEQA requires that

> [a]n adequate EIR must be prepared with a sufficient degree of analysis to provide decisionmakers with information which enables them to make a decision which intelligently takes account of environmental consequences. It must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project.

[3] The settlement was between Valley Water, the Fish and Wildlife Service, the National Marine Fisheries Service, the California Department of Fish and Game, the Guadalupe-Coyote Resource Conservation District, Trout Unlimited, the Pacific Coast Federation of Fishermen's Associations, and California Trout, Inc. The purpose of the settlement was "to resolve disputes regarding [Valley Water's] use of its water rights on Coyote, Guadalupe, and Stevens Creeks in Santa Clara County, California." (1994 Settlement Agreement.)

(*Kings Cnty. Farm Bureau v. City of Hanford*, 221 Cal. App. 3d 692, 712 (1990) (internal quotation marks and citations omitted); *see also Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova*, 40 Cal.4th 412, 442 (2007).) "The decisionmakers and general public should not be forced to sift through obscure minutiae or appendices in order to ferret out the fundamental baseline assumptions that are being used for purposes of the environmental analysis." (*San Joaquin Raptor Rescue Center v. County of Merced*, 149 Cal.App.4th 645, 659 (2007).) CEQA explicitly requires that an EIR be "organized and written in a manner that will be meaningful and useful to the decisionmakers and to the public." (Pub. Res. Code § 21003(b).)

CEQA requires that the Project be analyzed against the existing environmental conditions (the "environmental baseline"), in order that the Project's environmental impacts can be meaningfully analyzed and compared to alternatives. (CEQA Guidelines § 15125(a); *see County of Amador v. El Dorado County Water Agency*, 76 Cal.App.4th 931, 952 (1999); *Neighbors for Smart Rail v. LA County Metropolitan Transit Authority*, 57 Cal. 4th 310, 315 (2013).)

c. Pubic Trust and the Fish & Game Code

The goals of the EIR do not include keeping "fish in good condition," in spite of the clear statutory obligation Valley Water owes under the Public Trust Doctrine and under Fish and Game Code sections 5937 and 5948. Nor is fish condition sufficiently analyzed in the EIR to satisfy the requirements of California law.

There are a variety of public trust interests that pertain to California streams where such streams sustain a fishery. Under California law, wild fish are recognized public property, held in trust by the State. (*California Trout, Inc. v. State Water Resources Control Bd*. (Cal. App. 3d Dist. Jan. 26, 1989), 207 Cal. App. 3d 585, 255.) California Fish and Game Code section 5937 is the statutory expression of public trust protections for wild fish, holding that "[t]he owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam." The plain meaning, legislative history, and state court construction of section 5937 indicates that it places a duty on dam owners to maintain fish in good condition. (*NRDC v. Patterson* (E.D. Cal. Aug. 27, 2004), 333 F. Supp. 2d 906.)

Fish and Game Code section 5948 addresses fish passage and the presence of impassable barriers. Section 5948 states that

> No person shall cause or having caused, permit to exist any log jam or debris accumulation or any other artificial barrier, except a dam for the storage or diversion of water, public bridges and approaches thereto, groins, jetties, seawalls, breakwaters, bulkheads, wharves and piers permitted by law, and debris from mining operations, in any stream in this State, which will prevent the passing of fish up and down stream or which is deleterious to fish as determined by the commission, subject to review by the courts.

The Public Trust Doctrine predates modern law and holds that the waters, tidelands, and wildlife resources of the State are held in trust for everyone. The State acts as trustee to protect these

resources for present and future generations. That includes a duty to manage public trust resources for the benefit of the people of the State. Under the California Supreme Court's reasoning in *National Audubon*, diversions from non-navigable upstream tributaries can be regulated to protect public trust uses. (*National Audubon Society v. Superior Court* 33 Cal.3d 419 (1983).) This reasoning extends to Santa Clara County's hydrologically connected Three Creeks and their tributaries, which should also be regulated to protect public trust resources.

d. California Endangered Species Act (CESA)

In the EIR, Valley Water appears to attempt to provide regulatory assurances to limit, delay, or avoid reductions in water diversions in the future, claiming that water exports could not be reduced without environmental review in a CEQA document. However, having chosen not to meet the standards and requirements of CESA (Longfin Smelt and Green Sturgeon are CESA listed), this refusal for the last quarter centry to implement reductions in diversions fundamentally subverts the purposes of CEQA.

First, the California Supreme Court has concluded that regulatory assurances are unlawful under CESA. (*Environmental Protection Information Center v. Cal. Dept. of Forestry and Fire Protection*, 44 Cal. 4th 459 (2008).) Because the alternatives in the EIR do not meet the requirements of CESA, it is unlawful to provide regulatory assurances.

In addition, as discussed *infra*, the EIR must meaningfully analyze reductions in water diversions and improvements in environmental flows in order to consider a reasonable range of alternatives under CEQA. To the extent that this EIR adequately analyzes reductions in water diversions and increases in environmental flows, Valley Water need not prepare a new CEQA document before reducing diversions in the future, for instance if species continue to decline.

e. Clean Water Act (CWA) and California's Antidegradation Policy

Under the CWA, once the existing uses of a water body have been established, a states must maintain the level of water quality that has been identified as being necessary to support those existing uses. (CWA § 101(a); 40 CFR § 131.12(a).) This requirement is called antidegradation. California's Antidegradation Policy is contained in the State Water Resources Control Board's Resolution 68-16, titled "Statement of Policy with Respect to Maintaining High Quality of Waters in California."[4] Under California's Antidegradation Policy, high water quality must be maintained unless any degradation meets polices of maximum benefit to the people of California, impacts to present and future uses are reasonable, and water quality does not degrade below currently effective polices. (*Id*.) The EIR must meaningfully analyze proposed measures in light of California's Antidegradation Policy.

[4] Available at https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf.

III. FACTUAL BACKGROUND

a. Current State of Fisheries Resources in Valley Water's Service Area

Impairment of fish populations in the Three Creeks, along with their tributaries, as a result of inadequate releases and associated habitat degradation has been well documented for more than two decades.[5] In 2003, Valley Water and its collaborators in the FAHCE process released a "Summary Report" which claimed:

> The primary benefits to salmonids [from the FAHCE Fish Habitat Management Plan] are improved streamflows and improved access to enhanced spawning and rearing habitat. To improve streamflows, [Valley Water] will carefully orchestrate its reservoir releases to ensure both stream depth and stream temperatures support the life stages of salmonids. It will also investigate ways to supplement streamflows, such as using recycled water."

(FAHCE 2003 at 7.) The Summary Report also indicated that "FAHCE biologists expect that the existing population of roughly 200 returning adult salmonids as well as hundreds of small Steelhead will significantly increase with the habitat improvements outlined in the Fish Habitat Management Plan." (FAHCE 2003 at 7.)

The EIR provides no indication that a significant increase, or any increase at all, in the salmonid population has occurred over the intervening 18 years since the settlement and we are not aware of any other documentation suggesting that Steelhead, resident Rainbow Trout, or Chinook Salmon populations in the Three Creeks watershed have increased. Instead, Chinook Salmon and Steelhead populations in creeks where flows are controlled by Valley Water dams remain in poor condition.[6] For example, the EIR states that "[u]p-migrant trapping conducted by Valley Water from 1998 to 2006 captured a range of 13–104 adult Chinook salmon per year and additional redd surveys conducted from 1995 to 2016 found a range of 3–35 redds across the watershed per year (Valley Water 2018e; Valley Water and Stillwater Sciences 2017)." (EIR at 3-219.) Furthermore, surveys conducted by volunteers did not detect more than 20 adult Chinook Salmon in the Guadalupe River

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[5] *See, e.g.*, Buchan, L and P. Randall. 2003. *Assessment of Stream Ecosystem Functions for the Coyote Creek Watershed; Coyote Creek Watershed Integrated Pilot Assessment Final Report*. Santa Clara Valley Urban Runoff Pollution Prevention Program ("Buchan and Randall 2003"); Stillwater Sciences, 2004. *FINAL Stevens Creek Limiting Factors Analysis*. Technical Report. Prepared for Santa Clara Valley Urban Runoff Pollution Prevention Program. Prepared by Stillwater Sciences. 10 September 2004 ("Stillwater Sciences 2004"); Leicester, M. and J. Smith. 2016. *Guadalupe Creek Fish Sampling in October 2015 and 2016* ("Leicester and Smith 2016"); National Marine Fisheries Service. 2016. *Final Coastal Multispecies Recovery Plan*. West Coast Region, Santa Rosa, California. *Available at* http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_Steelhead/salmon_and_steelhead.html ("NMFS 2016"); Smith, J. 2017. *Stevens Creek Environmental Conditions and Fish Resources in 2017*. 21 December 2017 ("Smith 2017"); Guadalupe River Projects Adaptive Management Team (AMT). *Water Year 2018, DRAFT Mitigation Monitoring Report for the Downtown and Upper Guadalupe River Flood Projects, San Jose, California*. Prepared By Santa Clara Valley Water District & Stillwater Sciences ("Guadalupe River Projects Adaptive Management Team 2018"); AECOM and Michael Love & Associates. 2020. *Stevens Creek Fish Passage Analysis*. Prepared for Valley Water. *Available at* https://www.valleywater.org/sites/default/files/Stevens%20Creek%20Passage%202020.06.30.pdf ("AECOM and Michael Love & Assoc 2020").

[6] *See* Leicester and Smith 2016; NMFS 2016; Smith 2017; Guadalupe River Projects Adaptive Management Team 2018.

watershed in any year between 2017 and 2020.[7] Although abundance is only one factor contributing to salmonid population viability (McElhany et al. 2000; SEP 2019), these survey results reveal low total abundance and reproduction of Chinook Salmon, results which are not consistent with population viability and thus cannot represent fish "in good condition."

Steelhead populations in some Santa Clara creeks may be lower now, particularly following dry years, than they were when the FAHCE process began. For example, the EIR reports that "Steelhead were scarce or absent within downstream reaches of Stevens Creek in 2010, 2014, 2015, 2016, and 2017… ." (EIR Appendix K at 11.) Similarly, Leicester and Smith stated that due to low flow conditions following the 2012-2015 drought, "it is possible that Steelhead may no longer exist in the Guadalupe watershed. Similar situations exist in Coyote Creek, Stevens Creek, and Upper Penitencia Creek. Steelhead have been absent for several years in all three watersheds, and with *O. mykiss* occurring as scarce resident trout in Upper Penitencia and Stevens creeks… ." (Leicester and Smith 2016 at p. 4.) Juvenile *O. mykiss* (which may become either resident Rainbow Trout or anadromous Steelhead in the future) were detected in some of these waterways following wet (high river/creek flow) years in 2017 and 2019; however, their numbers remain severely depressed[8] at levels that are not consistent with population viability.

While Coyote Creek is not covered by the EIR, fisheries in that watershed indicate that Valley Water does not operate its dams to maintain fish in good condition. In December, 2017, Professor Jerry Smith at San Jose State University – whose other research is cited extensively in the EIR – released a report titled "Fish Population Sampling in 2017 on Coyote Creek." In his report, which is not cited in the EIR, Smith examined substantial reductions in reservoir and pipeline releases to Coyote Creek from 2014 to 2016 and the resulting lack of downstream flow continuity to provide adult fish passage. He also examined flow releases that exacerbated temperature problems in Coyote Creek. Smith found that,

> Despite brief windows of potential adult Steelhead access and suitable rearing conditions in summer and fall 2017, no juvenile Steelhead were captured during sampling at four sites in August or October. Apparently, the last potential smolts to successfully emigrate in Coyote Creek were in 2013. The unsuitable flow conditions, and the barrier at Singleton Road, have resulted in passage bottlenecks that have eliminated most or all Steelhead production for the past five years, potentially extirpating Steelhead.[9]

In order for Steelhead stocks to return to good condition, Smith found that habitat improvements such as the remediation of temperature problems at Ogier Ponds and the removal of the barrier to fish passage at Singleton Road would have to be completed in addition to "modification of current release strategies during late winter and spring to provide

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[7] S. Holmes, South Bay Clean Creeks Coalition, personal communication, February 1, 2021.
[8] *See, e.g.,* Valley Water 2019. *2019 Guadalupe River Watershed Fisheries Monitoring.* Prepared by Valley Water ("Valley Water 2019"); Valley Water. 2020. *2020 Guadalupe River Watershed Fisheries Monitoring*. Prepared by Valley Water ("Valley Water 2020").
[9] Dr. Jerry J. Smith, Fish Population Sampling in 2017 on Coyote Creek (17 December 2017), page 2 (Abstract), available at https://scvwd.legistar.com/View.ashx?M=F&ID=6342703&GUID=57FF1199-0AE3-42D4-8BFA-CC8882E52BFB.

for adult and smolt passage."[10] Increased releases of freshwater flows, he found, would provide habitat connectivity that is unavailable under current flow regimes. Such increased flows would also provide needed rearing feeding habitat, and habitat quality would be improved by reduced temperatures.[11]

Smith's work also highlights the lack of a comprehensive focus in the EIR. Coyote Creek and its associated watershed should be included in the EIR's study area. The lack of such coverage is another indication of the inadequacy of the EIR.

i. Barriers and Dams

The EIR states that there are eight priority fish passage barriers identified in the Settlement Agreement that have not been remediated. (EIR 2-8 – 2-9.) There are also five such barriers owned by others that also have not been remediated. (*Id*.) In addition to these barriers, there are significant numbers of other barriers in Valley Water's jurisdiction, both within the project area and outside of it, which are covered by Fish and Game Code section 5948's prohibitions on barriers to fish passage.

There are two types of these section 5948 barriers in the project area that the EIR fails to address. Both types are exacerbated by interactions with low flows. First, there are constructed barriers in the stream corridor, usually made up of rocks or other debris.[12] Second, there are barriers made up of downed woody debris and garbage that current flows are insufficient to move or overcome.[13] Low flows interact with these barriers in several ways. If flow is inadequate to get over a barrier, the flow will find its way around, but these barriers then prevent fish from getting through. If flow is that low, it is likely that there is not enough water depth on the downstream end for the fish to jump over the obstacles. Such barriers may prevent migration entirely, but more often they delay migration. And while fish are trying to get past these partially passable impediments, the fish are exposed to predators, exhausted, and potentially injured as a result of their efforts.

b. Species Present

The EIR focuses on Steelhead Trout and Chinook Salmon, and thus leaves out an evaluation of potential improvements and impacts for many of the species present in the area it does evaluate in spite of the obligation Valley Water has to protect those other species, as discussed further below under EIR Evaluation. There are many different types of fish present in the watersheds impacted by the Project, including Smelt, Sacramento Hitch, Lamprey, Sculpin, and Sturgeon, as well as many other fish, bird, and terrestrial species. The EIR is evaluating a project that will undeniably affect all

[10] *Id*.
[11] *Id.*
[12] These barriers have been observed on Los Gatos Creek – where one barrier appeared to be 30 yards wide and two feet high, constructed with big boulders – and Alamitos Creek – a smaller barrier constructed of round rocks – and can in general range from tiny obstructions to very big obstructions that block water flow for significant distances.
[13] These barriers can be formed by trees capturing leaves and garbage or by other unintentional formations. Under these circumstances, if flow was sufficient the water would just push through. But since flow is not sufficient, these barriers form mats of debris and spread out to the side, creating shallow passages. This creates exposure to aerial predators (mammals or birds) for fish attempting passage.

species that relate in any way to the water flowing down from behind Valley Water's dams, and therefore must include these species in its evaluation.

i. Longfin Smelt

Longfin Smelt (*Spirinchus thaleichthys*) are a native species that occupies estuarine and riverine environments in the South Bay. Longfin Smelt are small, semelparous fish with populations along the Pacific Coast from San Francisco Bay to Alaska. In San Francisco Bay, they are semi-anadromous (part of the population migrates to the ocean and back).[14] Longfin Smelt were once among the most numerous native fish in the estuary.[15] Given their former levels of abundance, it is highly likely that Longfin Smelt contributed to the historical whitebait fishery in San Francisco Bay.[16] However, according to at least one CDFW monitoring program, Longfin Smelt numbers have declined by more than 99% since the early 1980's.[17] In response to a petition to list Longfin Smelt under the California Endangered Species Act, the California Fish and Game Commission listed the species as threatened, throughout California, in 2009. The US Fish and Wildlife Service has acknowledged that the San Francisco Bay population of Longfin Smelt warrant protection under the federal Endangered Species Act, though the Service has maintained since 2012 that such listing has been precluded by other listing priorities. Despite a jump in Longfin Smelt abundance following very wet conditions in 2017, the California Department of Fish and Wildlife's Fall Midwater Trawl abundance index for this population declined substantially in 2018, 2019, and 2020. (*See* Figure 1, *available at* https://www.dfg.ca.gov/delta/data/fmwt/indices.asp.)

Longfin Smelt are known to occur in southern San Francisco Bay,[18] and it is likely that they spawned historically in the lower reaches of Coyote Creek and the Guadalupe River (and potentially

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[14] Levi S. Lewis, Malte Willmes, Arthur Barros, Patrick K. Crain, James A. Hobbs. 2020. *Newly discovered spawning and recruitment of threatened Longfin Smelt in restored and underexplored tidal wetlands*. The Scientific Naturalist 101(1):1-4 (Lewis et al. 2020). Also, CDFW. 2010.

[15] Moyle, P. B. 2002. *Inland Fishes of California*, Second Edition. Berkeley, CA: University of California Press (Moyle 2002); (Dege and Brown 2004). Dege, M., and L. R. Brown. 2004. Effect of outflow on spring and summertime distribution of larval and juvenile fishes in the upper San Francisco Estuary. Pages 49–65 in F. Feyrer, L. R. Brown, R. L. Brown, and J. J. Orsi, editors. Early life history of fishes in the San Francisco estuary and watershed. American Fisheries Society, Symposium 39, Bethesda, Maryland.

[16] (Baxter 1999), citing Skinner 1962. Baxter, R. 1999. Osmeridae. Pages 179–216 in J. Orsi, editor. Report on the 1980–1995 fish, shrimp, and crab sampling in the San Francisco Estuary, California. California Department of Fish and Game, Technical Report 63, Stockton. Available: www.estuaryarchive.org/archive/ orsi_1999/. (September 2002).

[17] Rosenfield, J. A., and R. D. Baxter. 2007. *Population dynamics and distribution patterns of longfin smelt in the San Francisco estuary*. Transactions of the American Fisheries Society 136:1577–1592 (Rosenfield and Baxter 2007); Nobriga, M. L., and J. A. Rosenfield. 2016. *Population dynamics of an estuarine forage fish: disaggregating forces driving long-term decline of Longfin Smelt in California's San Francisco Estuary*. Transactions of the American Fisheries Society 145:44–58 (Nobriga and Rosenfield 2016); *see also*, CDFW sampling data, *available at*: https://www.dfg.ca.gov/delta/data/fmwt/indices.asp.

[18] CDFW. 2010. *Life History Conceptual Model and Sub-Models for Longfin Smelt, San Francisco Estuary Population*. Prepared for the Delta Regional Ecosystem Restoration Implementation Plan. Prepared by J.A. Rosenfield. *Available at* https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=28421 (CDFW 2010); Lewis, L.S., Arthur Barros, Malte Willmes, Christian Denney, Christina Parker, Micah Bisson, James Hobbs, Amanda Finger, Grace Auringer, Alyssa Benjamin. 2019. *Distribution of Adult, Larval, and Juvenile Longfin Smelt in Tributaries and Marshes of the San Francisco Estuary*. 2018-19 Annual Report for DWR Contract # 4600011196 (Lewis et al. 2019a); Lewis, L.S., A. Barros, M. Willmes, C. Denney, C. Parker, M. Bisson, J. Hobbs, A. Finger, G. Auringer, A. Benjamin. 2019. *Interdisciplinary Studies on Longfin Smelt in the San Francisco Estuary*. 2018-19 Annual Report for DWR Contract #

Stevens Creek), and in the estuary formed by these waterways as they drain into San Francisco Bay. Recent evidence indicates that current flow patterns – especially chronic reductions in river flows to the Bay during winter and spring months – limit Longfin Smelt reproduction in this area, eliminating reproductive success in most years.

It is well-established that the abundance of the Bay's Longfin Smelt is strongly correlated with river flows into and through the Delta into San Francisco Bay during the winter and spring (December-June). Over several decades, indices of Longfin Smelt abundance calculated from various sampling programs have shown a very strong correlation with flow into the Delta (Delta inflow; Stevens and Miller 1983) and/or into San Francisco Bay from the Delta (Delta Outflow or X_2: Jassby et al.1995; Kimmerer 2002; Rosenfield and Baxter 2007; Kimmerer et al. 2009; Thomson et al. 2010; CDFW 2010; SWRCB 2010, 2017). In addition, recruitment and survival of juvenile Longfin Smelt in the northern Bay are strongly correlated with freshwater flow from the Delta into the Bay (SWRCB 2010, 2017; Nobriga and Rosenfield 2016).

ii. Other Fishes

The EIR provides information on three other fish species present or believed to be present in Stevens Creek and/or the Guadalupe River and its tributaries – Pacific Lamprey, Riffle Sculpin, and Sacramento Hitch. The EIR is silent regarding other fish species known or believed to occupy these creeks.[19] Curiously, the EIR does not describe the needs of resident Rainbow Trout or the effect of the proposed project on this well-known fish, which is much coveted by anglers. Resident Rainbow Trout both produce and are produced by Central California Coast Steelhead (the two fishes are different life forms of the same species, *O. mykiss*); therefore, the population status of Rainbow Trout is essential to understand the viability of Steelhead on these streams, as well as to understand the public trust benefit of actions that effect either form of *O. mykiss*. Also, because Rainbow Trout are year-round residents, they require suitable river conditions even during seasons when Steelhead are absent from local rivers – the ecological requirements of Rainbow Trout differ from those of adult Steelhead (the EIR acknowledges this; e.g., at 3-161). Nevertheless, the EIR does not analyze the effect of the Proposed Project on resident Rainbow Trout populations in the affected Creeks and the Guadalupe River.

1. Pacific Lamprey

Pacific Lamprey are known to be present in Guadalupe River and Stevens Creek. (EIR 3-156 (Table 3.7-1).) These migratory fish are a Species of Special Concern in California and are acknowledged to be in decline throughout much of their range by the U.S. Fish and Wildlife Service. Like anadromous salmonids, lamprey require adequate water quality and river flows to facilitate their freshwater migrations to and from spawning sites and for development of eggs and larvae

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4600011196 (Lewis et al. 2019b); Lewis, L. S., M. Willmes, A. Barros, P. K. Crain, and J. A. Hobbs. 2020. *Newly discovered spawning and recruitment of threatened Longfin Smelt in restored and underexplored tidal wetlands*. Ecology 101(1):e02868. 10.1002/ecy.2868 (Lewis et al. 2020); Hobbs, J.A., A. Cooper, C. Parker, M. Bisson, A. Barros, A. Alfonso, A. Alfonso, M.Willmes, L. Lewis. 2019. *Longfin Smelt Spawning in San Francisco's Bay Tributaries.* 2018-19 Annual Report for DWR Contract # 4600011196 (Hobbs 2019).

[19] *See, e.g.*, Leidy, R. 2007. *Ecology, Assemblage Structure, Distribution, and Status of Fishes in Streams Tributary to the San Francisco Estuary, California*. San Francisco Estuary Institute, Contribution 530 (Leidy 2007).

(known as ammocetes). However, juvenile and adult immigration periods differ somewhat from those of Central California Coast Steelhead or Chinook Salmon (EIR Table 3.7.2 at 3-158) and therefore, the Proposed Project's flow regimes would be expected to have a differential effect on this species as compared to the salmonids. Furthermore, Pacific Lamprey larvae live in sandy river bottoms for up to 5 years before they metamorphose into ocean-going lamprey; thus, these ammocetes require persistence of suitable conditions over long periods and are highly susceptible to inadequate flows during their incubation.

2. Riffle Sculpin

Riffle Sclupin are also known to be present in Guadalupe River and Stevens Creek. (EIR 3-156 (Table 3.7-1).) This native species is strongly associated with, and relies on, the same cold water habitats as Steelhead and Pacific Lamprey. But, unlike Steelhead and Pacific Lamprey, Riffle Scuplin live their whole lives in river habitats and so they require suitable temperature and flow conditions year-round throughout their life span.

3. Sacramento Hitch

Sacramento Hitch are believed to be present in the Guadalupe River, Los Gatos Creek, and the estuarine portions of Stevens Creek. (EIR 3-170.) These native minnows are associated with lower elevation habitats, downstream from areas where Rainbow Trout/Steelhead, Pacific Lamprey, and Riffle Sculpin spawn and rear during early stages of their life cycle. As noted in the EIR, Sacramento Hitch are more tolerant of higher temperatures than other native fish species. Given their tolerance for hot water, we question whether they are appropriately representative of other native fish species that will be affected by the flow regimes and habitat work of the Proposed Project.

In general, the EIR's analysis of effects to non-salmonid fishes is deficient. For example, whereas differences in daily availability among alternatives were estimated for Steelhead and Chinook Salmon, "… habitat availability was not modeled for Pacific lamprey, Sacramento hitch, or riffle sculpin in the Stevens Creek or the Guadalupe River portion of the study area because these three species were not the focal species of the Settlement Agreement (Valley Water et al. 2003) and therefore were not included during model development." (EIR 3-183.) Habitat availability for these species was evaluated either by estimating the wetted area of the stream that met temperature targets for each species or by assuming that habitat suitable for Steelhead was also suitable for Riffle Sculpin and River Lamprey; the first assumption is an inadequate indicator of whether fish are being maintained in good condition (fish need more than a wetted surface and non-lethal temperatures) and the second assumption defeats the purpose of analyzing the Proposed Project's effects on multiple fish species by assuming that one life form (Steelhead) of one species represents all (or most) of the other fish species present.

Furthermore, the EIR only considers effects to these species where they are currently known to occur; the possibility that fish do not occur in certain waterways because Valley Water does not maintain those creeks in adequate condition is not considered. For example, with regard to Impact AQUA 1-b, the EIR states: "Sacramento hitch have been observed only in the Guadalupe River and Los Gatos Creek, and therefore impacts to hitch habitat were assessed for those reaches in the study area;" no explanation as to why Sacramento Hitch would not be expected to occur in other parts of

the Project Area is provided. Adequate spatial extent is an important attribute of viable fish populations. (Mc Elhany et al. 2000; Rosenfield 2002.) Thus, if Sacramento Hitch would normally occur in Stevens Creek or other tributaries to the Guadalupe River, then it is important to know whether the Proposed Project is capable of restoring these fish to those areas. Indeed, the EIR acknowledges that Sacramento Hitch were frequently documented in the estuarine sections of Stevens Creek during the 1970s and 1980s, but conditions in this area are not analyzed because the EIR erroneously omits estuarine habitats from its analysis of effects. (*See, e.g.*, *infra* Section IV Project Objectives).

iii. Birds and Terrestrial Species

The EIR does not analyze impacts to birds that live in or near waters that will be affected by the Proposed Project. Numerous species of birds live in the watersheds of the Guadalupe River and Stevens Creek and their watershed. Most or all of these species are likely to be affected by changes in stream in the Proposed Project. Riparian bird species, including various species of swallows, which use mud to make their nests and which rely on aquatic insects for food would certainly be affected by changes in the volume, distribution, and seasonal persistence of flows anticipated under the proposed project. Also, and in particular, changes in flows that affect riverine fish populations should be expected to affect piscivorous birds, including, but not limited to Lesser Egret, Great Blue Heron, Belted Kingfisher, and Osprey.

Furthermore, the Proposed Project will change patterns and volumes of freshwater flow into San Francisco Bay from Stevens Creek and the Guadalupe River. These changes will affect the distribution and aerial extent of freshwater tidal and brackish water habitats in southern San Francisco Bay. These waterways enter the Bay in and near the Don Edwards Wildlife Refuge and the massive South Bay Salt Pond Restoration project, which are known for their populations and diversity of wading birds and waterfowl. Nevertheless, the EIR fails to analyze the effect of changed Bay inflow patterns on the aquatic wildlife of the South Bay.

IV. EIR EVALUATION

a. Project Description and Objectives

It is settled law that, "[a]n accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR." (*County of Inyo v. City of Los Angeles,* 71 Cal. App. 3d 185, 193 (1977).) CEQA requires that a EIR identify a preferred alternative. (*Washoe Meadows Community v. Department of Parks and Recreation*, 17 Cal.App.5th 277, 285-87 (2017).) That preferred alternative must give a clear explanation of the nature and scope of the proposed project, otherwise it "is fundamentally inadequate and misleading." (*See Communities for a Better Environment v. City of Richmond*, 184 Cal.App.4th 70, 84-85 (2010).)

The EIR's Project Objectives (EIR 2-9) say that the Project is supposed to restore Steelhead Trout and Chinook Salmon, but arbitrarily limits the area evaluated to exclude vital areas – in particular Coyote Creek and all tidally influenced or estuarine areas – for that restoration. The project area, according to the EIR, "extends from the Valley Water dams to the tidally influenced areas of Stevens Creek and Guadalupe River; the Proposed Project and alternatives would not

substantially affect aquatic habitat conditions in the tidally influenced and estuarine reaches because of the dominant influence of tidal conditions on habitat in these areas, both historically and under existing conditions." (EIR 2-2.) Excluding from the EIR's analyses the tidally-influenced reaches of the Guadalupe River and Stevens Creek and the estuarine habitats adjacent to the mouths of these waterways is arbitrary; freshwater flows from these rivers/creeks determines or has a significant effect on most of the environmental conditions relevant to fish and wildlife in the tidally-influenced habitats in and adjacent to these waterways, including salinity, turbidity, currents, and (potentially) water temperatures.

The Project Purpose also says that it has to be consistent with the District Act, which mandates that Valley Water provide "sufficient water for all beneficial uses in the county." (EIR 2-9.) This unilateral elevation of Valley Water's goals to equal status with wildlife protection does not authorize Valley Water to violate the Fish & Game Code, the Public Trust, or any other applicable state or federal law. Project Objective 3 says it is the objective of the Project to maintain water supplies, but it does not rank the objectives or describe what might occur when there's a conflict between providing water supply and providing flows needed for fish survival. (EIR 2-10.) Valley Water does not have the authority to balance these objectives, and the EIR should make clear that Objective 3 is only to be satisfied once required wildlife objectives are met.

i. Management Objectives – The Proposed Project and EIR Substitute Arbitrary Management Objectives for Description and Analysis of Outcomes that would Satisfy Valley Water's Obligations to Protect Fish and Wildlife

The Plan as described in the EIR does not achieve the future conditions intended by the FAHCE Agreement, so inasmuch as the EIR relies on the FAHCE Agreement, the EIR is not internally consistent. There are no management objectives in the EIR, so where such objectives are referred to, they must mean the FAHCE objectives. The FAHCE objectives, in turn, explicitly say that fish populations have to be healthy. However, the EIR's description of current fish populations indicates that fish are not healthy and its analyses do not indicate that the Proposed Project will substantially improve the health of these populations.

The EIR does not make clear that the Proposed Project is designed to satisfy Valley Water's legal obligations to protect fish, wildlife, fisheries, and water quality. Rather, the EIR states that "[m]easures developed through FAHCE are intended to modify instream flows and improve habitat conditions, as appropriate, to meet the management objectives specified in the Settlement Agreement Regarding Water Rights of the Santa Clara Valley Water District on Coyote, Guadalupe and Stevens Creeks, initialed by the Initialing Parties on May 27, 2003." (EIR at 1-5; *see also* Appendix K at 1.) Further illustrating its reliance on FAHCE, the EIR directs the public and decisionmakers to Appendix B of the Settlement Agreement (Valley Water et al. 2003), which is titled "Proposed Schedule of Implementation." This Appendix consists of a list of the names of activities that the FAHCE proposes to complete in four "adaptive management" phases, which are intended to occur sequentially – the first three phases are intended to last for 10 years each and the final phase lasts indefinitely. Appendix B is further subdivided into lists of "Actions," "Adaptive management," and "Studies," none of which are described in any detail. More importantly, none of these activities

clearly identifies a purpose or objective for the activity that would inform the reader regarding the intended biological outcome of that activity.

Neither the EIR nor Appendix B of the Settlement Agreement describe what outcomes are necessary to satisfy Valley Water's environmental obligations to protect fish, wildlife, water quality, and fisheries, and there is no way to know what results would indicate that particular actions or the Project as a whole have succeeded or failed. This is a substantial omission, especially given that the Proposed Project purports to be based on adaptive management and makes certain actions (i.e., those in Phases 2 and 3) contingent on the results of earlier actions, studies, and adaptive decision-making. The EIR mentions the Public Trust only once, in its description of the Regulatory Setting for the project (EIR 3.4.2; Regulatory Setting at p. 3-73), but it provides no analysis or evaluation of the Proposed Project's effect on Public Trust resources.

Similarly, the EIR fails to analyze whether fish and wildlife beneficial uses identified in the Basin Plan for San Francisco Bay will be restored, reasonably protected, or maintained under the Proposed Project. For example, EIR Appendix A has a section entitled "Beneficial Uses to be Protected," but it does not mention fish and wildlife beneficial uses identified in the Basin Plan. The EIR does not establish levels for beneficial uses that would be considered adequate—its comparison of relative impacts to beneficial uses from different project alternatives (e.g., at Table 4.8-2.) does not serve this function. The FAHCE settlement agreement (Valley Water et al. 2003) includes a covenant which states: "the Parties will support the adoption of license and permit amendments in substantial conformity with this Agreement and the issuance of each of the findings set forth in Exhibit B, *if the record continues to demonstrate that these measures are the best alternative to protect and maintain the beneficial uses of these waters* and otherwise comply with applicable laws." (FAHCE § 4.1.3 (emphasis added).) Thus, comparing levels of support for beneficial uses under the Proposed Project (and alternatives) to levels that are determined in advance to be adequate is essential to evaluating the Proposed Project.

ii. Fish and Game Code – The Proposed Project and EIR do not Incorporate Requirements that Fish be Kept in Good Condition

California Fish and Game Code Section 5937 requires that "[t]he owner of any dam shall at all times release sufficient water to keep in good condition any fish that may be planted or exist below the dam." This requirement applies to Valley Water's dams on Coyote Creek, the Guadalupe River, Stevens Creek, and their tributaries. The FAHCE Settlement Agreement, in keeping with this mandate, commits Valley Water and other Initialing Parties to "a program of measures intended to *restore and maintain fisheries, wildlife, water quality and other beneficial uses* of the Three Creeks in good condition." (FAHCE § 6.2.1 (emphasis added); *see, e.g.*, EIR 6-2).) In spite of this mandate and commitment from FAHCE, where the EIR mentions the requirements of Fish and Game Code § 5937, it is only to condition compliance with those statutory requirements on attainment of Valley Water's other plans and obligations – the EIR includes no analysis of whether the Proposed Project is reasonably likely to result in fish populations that are "in good condition." Indeed, the EIR's analyses reveal that, under the Proposed Project, there will be no meaningful improvement in migratory access of adult Chinook Salmon to spawning grounds (EIR 3-219) and that there will be reductions in available habitat in several places. Even results indicating positive effects on some

attributes of Steelhead habitat do not place the results in context of the levels that are necessary to ensure that this fish population is kept in good condition.

The Proposed Project and EIR focus on attainment of management objectives that do not necessarily translate into satisfaction of Valley Water's environmental obligations. As a result, the EIR does not analyze or demonstrate how the Proposed Project will satisfy Valley Water's legal obligations to protect fish, wildlife, water quality, and fisheries. The EIR explains that Valley Water's Purpose in implementing the Proposed Project is to "restore and maintain *healthy* Steelhead trout and salmon populations as appropriate to each of the Three Creeks by providing (A) suitable spawning and rearing habitat within each watershed, and (B) adequate passage for adult Steelhead trout and salmon to reach suitable spawning and rearing habitat and for out-migration of juveniles." (EIR at 2-9 (emphasis added).) But the EIR does not define "healthy" populations and this omission may lead to interpretations that are not consistent with Valley Water's legal obligations to protect fish, wildlife, water quality, and/or fisheries.

The EIR uses the phrase "in good condition" only three times: once while describing the Project Purpose in relationship to the FAHCE Settlement Agreement;[20] once in the description of Fish and Game Code section 5937 (EIR 3-177); and once with respect to "General Plan and Noise Ordinance Specifications." (EIR at Table 3.14-4.) Metrics that define what fish "in good condition" would look like are not described by the EIR or the FAHCE Agreement that the Proposed Project implements and, as a result, the EIR does not analyze whether the Proposed Project is likely to maintain fish "in good condition."

The meaning of "in good condition" has been defined generally as follows: (1) individual fish must generally be in good health: (2) populations of fish must be self-sustaining and supported by extensive habitats required by all relevant life history stages; and (3) assemblages of fish must be dominated by native fishes (including runs of salmon and other anadromous species) that were present historically and support sustainable fisheries for native species, at a minimum.[21] For the most part, the EIR fails to assess the Proposed Project's likelihood of attaining these required outcomes. There is no description of the health of individual fish currently or the Proposed Project's effect on fish health in general.[22] Also, there are no analyses of the attributes of fish population viability (McElhany et al. 2000; SEP 2019) that form the basis of "self-sustaining" populations and describe a population's ability to contribute to public fisheries.

In addition, fish "in good condition" is not limited to maintaining just one species (Chinook Salmon) and one life-history variant of another species (Steelhead are the anadromous form of *O.*

[20] "The Settlement Agreement commits to a program of measures intended to restore and maintain fisheries, wildlife, water quality, and other beneficial uses of the Stevens Creek and Guadalupe River watersheds in good condition (Settlement Agreement Section 6.2.1)." (EIR at 2-9.)

[21] *See* Moyle, P.B., M. P. Marchetti, J. Baldridge, and T. L. Taylor. 1998. *Fish Health and Diversity: Justifying Flows for a California Stream. Fisheries*, 23(7):6-15 (Moyle et al. 1998); Grantham, T. E. J.H. Viers, and P.B. Moyle. 2004. *Systematic Screening of Dams for Environmental Flow Assessment and Implementation*. BioScience, 64(11):1006–1018 (Grantham et al. 2014).

[22] Some examples of such descriptions might include the proportion of the population exposed to temperatures that facilitate spread of disease or parasites; the extent of salmonid nest dewatering; the proportion of the population exposed to inadequate creek depths or temperatures during migration, or the frequency (proportion of years) in which such deleterious exposures occur.

mykiss). By limiting the targeted fish populations to Steelhead and Chinook Salmon, the Project Purpose is not conducting a wide enough inquiry to ensure consistency with California Fish and Game Code section 5937's mandate—or any other, similar statutory mandate—to keep fish in good condition.

iii. As a Result of its Flawed Project Description and Objectives Analysis, the EIR Does Not Fulfil Legal Requirements, which Require Clear Biological Objectives

The EIR's analysis of the effects of the Proposed Project appears to assume, incorrectly, that by increasing the average amount of habitat or the average availability of migration corridors for Chinook Salmon and the Steelhead life history variant of *O. mykiss*, it will (1) maintain fish "in good condition;" (2) offer reasonable protection of the Public Trust; and (3) adequately protect identified fish and wildlife beneficial uses. These assumptions are wrong for several reasons. First, it is possible to improve habitat quality or quantity marginally, but still not adequately support fish and wildlife populations. Second, the omission of targets for biological outcomes relevant to fish in good condition asks readers to believe that the EIR can define attributes of fish habitat and predict the Project's effects on that habitat into the future, but that it cannot identify the quantity or quality of habitat necessary to fulfil Valley Water's legal obligations. For example, the EIR refers to previous Limiting Factors Analyses to determine whether effects are meaningful or not, but factors limiting fish populations are likely to change as environmental conditions change naturally or in response to Valley Water's actions, including those in the Proposed Project. Knowing whether a particular habitat type will ultimately limit success of the Project and attainment of Valley Water's legal obligations requires knowing how many fish that habitat needs to sustain and what level of success (survival, reproduction, life history diversity) those fish need to display in order to maintain self-sustaining (viable) populations or to support public fisheries.[23] As a result, the EIR does not provide information that the public and decision-makers will need in order to evaluate whether the Proposed Project is likely to achieve outcomes that comply with state law.

Similarly, the EIR fails to define outcomes that will trigger the various phases of project implementation identified as phases of adaptive management. The Project consists of three phases, representing different levels of conservation effort to be implemented sequentially, and only if necessary to attain "management objectives," in addition to a fourth phase that would maintain instream flows in accordance with previous phases and monitor measures implemented as part of the Fish Habitat Restoration Plan. But, because the FAHCE management objectives – which are referred to by the EIR as being imported from FAHCE – identified in the EIR (§ 6.2.2; Appendix B) relate to physical and chemical conditions in certain Santa Clara Valley creeks, rather than the desired biological condition of the fish that the Proposed Project is intended to benefit, it is impossible for the reader to know what phase of adaptive management (if any) is likely to be enough.

Because the EIR does not provide an adequate definition of "healthy" populations of Chinook Salmon or Steelhead, much less specific measurable and relevant metrics that define fish

[23] This does not mean that the Project is a failure if a targeted number of fish do not materialize, as implied by the EIR (§ 6.3.3 at p. 6-5), only that the Project cannot claim a likelihood of future success if it does not provide the minimum amount of each habitat necessary to support key biological outcomes.

"in good condition," the EIR fails to demonstrate how the Proposed Project will satisfy requirements of state law. The Final EIR should establish biological outcomes (specific, measurable, achievable, relevant, and time-bound (SMART) performance thresholds or biological objectives) that are consistent with fish "in good condition" and that include support for fish and wildlife beneficial uses. These performance thresholds should include, at a minimum, hatching success, somatic growth rates of resident fish, and survival rates of resident and migrating juveniles and adults. Furthermore, the extent of desired habitat should be set with reference to targets for population size, survival, reproductive success, and life history diversity that are consistent with viability and fish in good condition. Only by establishing biological objectives and targets can the public and decisionmakers evaluate whether the Proposed Project is scaled adequately and phased appropriately to attain the Plan's purposes. The only way to transparently demonstrate adequate performance and determine adaptive management actions is to compare monitoring results to pre-established biological targets (e.g., SMART performance thresholds or objectives). Establishing these metrics is possible, as demonstrated by the suite of biological and environmental objectives established for Chinook Salmon and both resident and anadromous *O. mykiss* for the Stanislaus River. (SEP 2019.)

iv. The Proposed Project and EIR Improperly Subordinate Requirements to Protect Fish, Wildlife, and Identified Beneficial Uses of Water to Valley Water's Other Obligations

The EIR improperly treats Valley Water's obligations to satisfy requirements of California's Fish and Game Code, the Public Trust Doctrine, and the San Francisco Bay Basin Plan as though they are co-equal to, or even less important than, Valley Water's other obligations. The EIR defines the Project Purpose as to: "restore and maintain healthy Steelhead trout and salmon populations *as appropriate* to each of the Three Creeks." (EIR 2-9 (emphasis added).) "As appropriate" is defined to mean "Valley Water's implementation of restoration measures must be consistent with the purpose of the Santa Clara Valley Water District Act (District Act), including providing sufficient water for all beneficial uses in the county." (EIR 2-9.) The EIR further clarifies that Objective 3 of the Proposed Project is to:

> Maintain flexible and reliable groundwater recharge to support current and future water supply and water deliveries for municipalities, industries, agriculture, and the environment in a practical, cost-effective, and environmentally sensitive manner so that sufficient water is available for any present or future beneficial use, including, but not limited to, the acquisition, storage (including surface and underground storage), and distribution of water for irrigation, domestic, fire protection, land subsidence prevention, reduced reliance on Delta imported water supplies, municipal, commercial, industrial, and environmental purposes.

(EIR 2-10.)

Subordinating the requirements of the Fish and Game Code, the fish and wildlife beneficial uses identified in the Bay Basin Plan, or the Public Trust doctrine to the District Act or to Valley Water's desire to support "flexible" and "cost effective" supply and delivery of "sufficient water for any present or future beneficial use" is inappropriate, especially because Valley Water is already not meeting its legal obligations to protect fish and wildlife in waterways under its control. (*See, e.g.*,

National Audubon, 33 Cal. 3d at 436 (Public Trust rights are paramount and controlling).) This is particularly true given that the flow regimes described for the Proposed Project are tethered to reservoir storage levels, as described below.

Under storage levels that have occurred in 10% of years historically, the Proposed Project provides no additional flows to benefit fish and wildlife. Thus, if Valley Water chooses to increase water deliveries for municipalities, industries, or agriculture, then reservoir storage levels may be reduced such that reservoir releases to the creeks covered by the Proposed Project occur less frequently and at lower magnitudes than anticipated in the EIR analyses. This very real possibility will limit any positive effects of the flow regimes in the Proposed Project, including increasing the frequency of years in which no additional reservoir releases are made under the Project. The EIR describes that, under historic reservoir management practices, even the minimum flows of the Proposed Project will not occur in 10% of years. This is an unacceptably high frequency for insufficient water releases that will not result in target fish species in good condition. Even "rare" dry conditions can occur in sequential years (e.g., the drought sequences from 2013-2015 or from 1987-1991); failure to provide sufficient flows for fish in 10% of years is highly likely to result in population crashes or extirpation of target species from the watersheds identified in the EIR.

b. The Project Area is Arbitrary and Excludes Environments and Resources that will Certainly Be Affected by the Proposed Project and/or Project Alternatives

The EIR covers implementation of the FAHCE Agreement to only two of the watersheds impacted by operations at Valley Water's dams, Stevens Creek and the Guadalupe River. Valley Water has limited its evaluation of those two watersheds by cutting off its project area at the point where they become tidally influenced.

> The Project area extends from the Valley Water dams to the tidally influenced areas of Stevens Creek and Guadalupe River; the Proposed Project and alternatives would not substantially affect aquatic habitat conditions in the tidally influenced and estuarine reaches because of the dominant influence of tidal conditions on habitat in these areas, both historically and under existing conditions. The Project area is, therefore, smaller than the entire Stevens Creek and Guadalupe River watersheds.

(EIR at 2-2.) Likewise, Appendix K states that

> The Proposed Project would not substantively affect aquatic habitat conditions in the tidally influenced and estuarine reaches of Stevens Creek and the Guadalupe River (Alviso Slough) because of the dominant influence that tidal conditions have on the habitat in these areas, both historically and under current baseline conditions. Valley Water recognizes that changes in reservoir flow releases to the upstream reaches of these streams could have some minor effect on flow-dependent habitat availability or salinity conditions in the tidally influenced reaches, depending on the time of year, climatic conditions, tidal influence, and accretions and depletions of flow along the creeks. The study area creeks have the greatest potential to alter aquatic habitat conditions in tidally influenced reaches

> during relatively high-flow events during the winter and spring because of a combination of reservoir releases and downstream accretions, including urban runoff.

(EIR Appendix K at 2.) This Project Area is arbitrary and overly restrictive.

The claim that the Proposed Project would not affect aquatic habitat conditions in the tidally influenced and estuarine reaches of the Bay's receiving waters is without basis and denies the very definition of an estuary – the volume and timing of freshwater flowing into the estuary literally determines or strongly influences most of the aquatic habitat conditions of that estuary. These effects include salinity, currents, turbidity, and the concentration and distribution of food items and pollutants. Juvenile Steelhead and Chinook Salmon pass through this environment and undergo transformations (including growth and metamorphosis into ocean-going fish) that have major effects on their future viability. In the northern San Francisco Estuary, populations of estuarine species, such as Longfin Smelt, Starry Flounder, Bay Shrimp, Mysid Shrimp, and other invertebrates respond strongly to freshwater inputs[24] and there is no reason to believe that their response to freshwater inflows from the Guadalupe River, Stevens Creek, and Coyote Creek would be any different.

Furthermore, the South Bay Salt Pond Restoration is a major environmental feature of the estuary at the mouth of Guadalupe River and Coyote Creek. Birds and other wildlife in this area that have preferences for waters of different salinities will be impacted by estuarine salinity changes that result from implementation of the FAHCE flow regime. In addition, to the extent that birds prey on fish in the vicinity of the restored salt ponds, they will be impacted by the response of forage fish populations to changed patterns of freshwater inflow that occur under the Project. Longfin Smelt are but one of many examples of forage fish that live in the outfall of the Three Creeks with populations that are likely to respond to changes in the freshwater inflow regime. Therefore, the EIR's exclusion of the lower Guadalupe River and Stevens Creek—and the estuarine environment they form with Coyote Creek—from the Project Area description and from the analysis of Proposed Project impacts is inappropriate and does not satisfy the requirements of CEQA.

c. Timing

On the whole, the EIR lacks specificity regarding the Project's implementation timeline. Compounding this uncertainty, the EIR claims that various other processes and permissions govern the Project timeline. Together, these flaws in the Project's timing suggests that the entire Project is not reasonably certain to occur within the timeframes that are described in the EIR. And regardless

[24] Kimmerer, W. J. 2002. *Effects of freshwater flow on abundance of estuarine organisms: Physical effects or trophic linkages?* Marine Ecology Progress Series 243:39–55 (Kimmerer 2002); Kimmerer, W.J., E.S. Gross, and M.L. MacWilliams. 2009. *Is the response of estuarine nekton to freshwater flow in the San Francisco Estuary explained by variation in habitat volume?* Estuaries and Coasts 32:375-389 (Kimmerer et al. 2009); Mac Nally, R., J. R. Thomson, W. J. Kimmerer, F. Feyrer, K. B. Newman, A. Sih, W. A. Bennett, L. Brown, E. Fleishman, S. D. Culberson, and G. Castillo. 2010. *Analysis of pelagic species decline in the upper San Francisco Estuary using multivariate autoregressive modeling (MAR)*. Ecological Applications 20:1417-1430. *Available at*: http://online.sfsu.edu/~modelds/Files/References/MacNallyetal2010EcoApps.pdf (Thomson et al. 2010); Thomson, J., W. Kimmerer, L. Brown, K. Newman, R. Mac Nally, W. Bennett, F. Freyer, and E. Fleishmann. 2010. *Bayesian change point analysis of abundance trends for pelagic fishes in the upper San Francisco Estuary*. Ecological Applications 20:1431–1448 (MacNally et al. 2010); SWRCB 2017.

of this internal inconsistency, the timing laid out in the EIR is certainly not adequate to protect and restore fish populations, including the very fish the Project seeks to benefit.

The EIR fails to evaluate the impacts of the massive delays that have occurred since the filing of a complaint with the State Water Board 25 years ago, combined with the delays contemplated by the EIR which indicate that Project implementation will not be completed for decades from now. CEQA requires that the analysis of potential environmental impacts address the full duration of the project, not just the environmental impacts at the very beginning of the project. CEQA Guidelines explicitly require consideration of "both the short-term and long-term effects." (14 Cal. Code Regs. § 15126.2(a).) As the Supreme Court noted in *Neighbors for Smart Rail*,

> Even when a project is intended and expected to improve conditions in the long term—20 or 30 years after an EIR is prepared—decision makers and members of the public are entitled under CEQA to know the short- and medium-term environmental costs of achieving that desirable improvement. These costs include not only the impacts involved in constructing the project but also those the project will create during its initial years of operation. Though we might rationally choose to endure short- or medium-term hardship for a long-term, permanent benefit, deciding to make that tradeoff requires some knowledge about the severity and duration of the near-term hardship. An EIR stating that in 20 or 30 years the project will improve the environment, but neglecting, without justification, to provide any evaluation of the project's impacts in the meantime, does not "giv[e] due consideration to both the short-term and long-term effects" of the project (Cal. Code Regs., tit. 14, § 15126.2, subd. (a)) and does not serve CEQA's informational purpose well.

(57 Cal. 4th at 455.) Nevertheless, the EIR fails to analyze the long-term impacts of delaying appropriate flows. As in *Neighbors for Smart Rail*, an EIR that fails to evaluate a project's impacts in the medium-term or longer-term does not give "due consideration to both the short-term and long-term effects" of the project. (14 Cal. Code Regs. § 15126.2(a).)

i. The Proposed Project Relies on Measures and Other Projects that are Not Reasonably Certain to Occur and, as a Result, the EIR Does Not Describe a Stable or Transparent Project Timeline.

The EIR describes three dams in the Guadalupe River Project Area that currently operate under restrictions that "reduce reservoir storage capacities until identified safety concerns specific to each dam have been addressed." (EIR at 2-12.) The EIR explains that "[w]hat this means for this Project is that implementation of the reservoir flow releases (such as the pulse flow releases) that make up the proposed re-operation rule curves would be limited to flow release levels that correspond to the interim restricted capacity of each facility, assuming water storage reaches that level in a given year, until each retrofit project is completed." (EIR at 2-12.) The EIR also reveals that "[t]hese projects are currently being defined, and each will undergo separate environmental review under CEQA. The timeframe for engineering, environmental review, and implementation of each of these projects is uncertain and will be staggered." (EIR at 2-12.) To paraphrase, the EIR analyzes what it would be like to implement FAHCE under current reservoir storage restrictions,

which deem reservoir storage unsafe, and then says that when these dams are fixed they will be able to fully implement Project flows. In other words, the EIR identifies the construction of the new dams as something that still must be planned for, and that has no current timeline. Because FAHCE flow curves are based on storage, reservoir releases will be lower as a result of current restrictions on reservoir capacity. Although it is clear that Valley Water should not fill reservoirs beyond the point where they are no longer safe to operate, these temporary limitations do not mean that Valley Water is free from responsibility to release water from its dams sufficient to meet its legal obligations to protect fish and wildlife.

In addition, by making the Proposed Project subject to a long list of contingencies, the EIR presents a timeline for implementation of the Proposed Project that is neither stable nor transparent. (EIR at 2-52.) With respect to these contingencies, the EIR states that "[t]he exact start date for implementing specific measures varies from measure to measure and watershed to watershed." (EIR at 2-52.) Furthermore, the EIR explains that "[a]ccording to the Settlement Agreement, a maximum of $42 million will be made available by Valley Water in each of the Phases 1, 2, and 3 in accordance with the agreed-upon cost accounting methodology." (EIR 2-9, fn 2.) The terms of a Settlement Agreement reached 18 years ago cannot define the limits of Valley Water's obligations to protect fish, wildlife, and fisheries, as well as to manage other environmental attributes below dams it operates.[25]

None of the contingencies or self-imposed limitations on the Proposed Project described in the EIR supersede Valley Water's legal obligations to protect fish, fisheries, and wildlife. By contrast, the EIR claims that Valley Water has begun some (unspecified) Phase I flow operations already. (EIR 2-52.) The EIR fails to describe these activities in detail or to explain why such activities are permissible, even as the EIR claims that implementation of other aspects of the Proposed Project must wait on satisfaction of other contingencies.

ii. Uncertainties Regarding Permits and Planning Requirements are not Sufficient Justification for Further Delaying Project Implementation

According to the EIR, implementation of the Project is contingent on CEQA, the National Environmental Policy Act, permits from the California Department of Fish and Wildlife and the National Marine Fisheries Service, and alteration of their state water rights. This is not sufficient justification for further unreasonable delays. Valley Water has been on notice that it must implement measures to protect fish below its dams for 25 years, they do not need another 25 years to get it done.

While the EIR does identify known flow impediments (small diversions, fish ladders, etc.), no timeline is provided to fix them. The EIR merely says that they do not have specific design plans in place to fix these things.

[25] California law, for example, does not allow settlements that illegal, contrary to public policy, or unjust. (*Timney v. Lin*, 106 Cal. App. 4th 1121, 1127 (2003); Cal. Civ. Proc. Code § 664.6.)

d. Environmental Setting and Impact Analysis

CEQA requires that the EIR accurately assess potential environmental impacts from the proposed Project and alternatives, using credible methods of analysis. (See, e.g., Cal. Code Regs., tit. 14, § 15151; *Laurel Heights Improvement Assn. v. Regents of University of Cal*., 47 Cal.3d 376, 409 (1988).) The EIR fundamentally fails this essential function, and it fails to disclose environmental impacts that are significant and fails to use appropriate metrics. The EIR therefore must be revised and recirculated.

In addition, the EIR fails to adequately analyze environmental impacts from future waivers of flow requirements during future droughts. This, too, violates CEQA as emergency declarations have become common and are foreseeable.

i. Metrics Evaluated in the EIR are Not Those Needed to Properly Evaluate the Likelihood that Fish Population Viability Will Improve Under the Proposed Project

In order to keep fish in good condition, Valley Water's reservoirs must be operated to support the fishes' entire life cycle. Fish success in any one generation will be determined by whichever habitat, if any, or transition between habitats limits success of that cohort. Thus, analyses of habitat that includes passage quality, quantity, and duration must be integrated with the relevant life-cycle analysis and measured against levels of success consistent with viability and fish condition (e.g., survival, growth, and reproduction). The key question in evaluating fish population viability and a given watershed's ability to support a fishery is how frequently (what proportion of years) are all attributes of habitat sufficient to support pre-determined levels of success that are consistent with viable (fishable) populations? Flow regimes that limit the success of any life history stage to levels below those necessary to maintain viability are not consistent with maintaining fish populations "in good condition" and may render improved habitat conditions in other life history stages meaningless. For example, if egg incubation conditions in a given year are extremely bad (high mortality), then it would be of little value that adult migration conditions or juvenile rearing habitat were improved for that same cohort.

Therefore, it is of particular concern that the EIR analyzes habitats deemed essential to different life history stages in isolation, and reports differences between alternatives in terms of average or total numbers of days of improved or degraded conditions. These summary statistics fail to reveal frequency across years in which habitats necessary to complete the salmonid lifecycle will be adequate. For instance, the EIR reports that:

> The average number of days per year when stream conditions were suitable at individual POIs for adult Steelhead and Chinook salmon passage during the modeling period was estimated from the FAHCE WEAP Model predicted daily upstream adult passage suitability. Additionally, the total number of days when adult Steelhead and Chinook salmon passage could occur throughout the 20-year analysis period was calculated by summing the days with suitable passage conditions from 1991 to 2010.

(EIR at 3-184; *see also* EIR App k. at 36.) Neither metric (total days over 20 years or average days per year) is directly relevant to the long-term viability of salmonids or their ability to support a fishery because both metrics fail to reveal years when adult passage is limited to a very few, or even zero, days.

The EIR's analyses of other salmonid life stages is subject to the same concern. Chinook Salmon are semelparous (die after spawning), and Steelhead are nearly so. This means that consecutive years without adequate passage (e.g., during a drought) could represent complete loss of or severe damage to the population. Given that the Proposed Project provides very little or no flows intended to benefit fish and wildlife during dry years (or when reservoir storage is low, for any reason), it is essential that the EIR reveal the frequency of years under which suitable habitat conditions will be maintained throughout the seasons necessary to support relevant life stages.

ii. The Proposed Project is Unlikely to Satisfy Valley Water's Obligations to Protect Fish, Wildlife, Water Quality, and Fisheries

Despite the EIR's failure to evaluate the effects of the Proposed Project against relevant metrics, it is clear that the Proposed Project is unlikely to satisfy requirements of Fish and Game Code, the Public Trust doctrine, or the Regional Water Quality Control Board's Basin Plan for San Francisco Bay. First, as described above, the Plan is intended only to benefit one species (Chinook Salmon) and one life-history type of another species (*O. mykiss*). With respect to non-salmonid fish species analyzed by the EIR, the "wetted area" and temperature analyses – which are the only tools used for evaluating impacts to non-salmonids – show very little change in conditions on the Guadalupe River versus the current or expected future baseline. (Appendix K, Fisheries and Aquatic Habitat Technical Memorandum, Attachment K.2.) The Proposed Project is expected to change flow and temperature dynamics on Stevens Creek (e.g., Figure K.2.8) resulting in both seasonal increases in wetted area as well as decreases in wetted habitat in other seasons. (Figure K.2.9.) Whereas "unwetted" habitat almost certainly represents area where fish species cannot live, the EIR inappropriately counts positive changes in wetted area as increases in "habitat" for non-salmonid species; just because an area is wetted does not mean that the flow in that area is adequate to support fish, much less fish "in good condition." The EIR also identifies predicted increases in average weekly river temperatures at some points along Stevens Creek, under the Proposed Project – increases in the highest temperatures may reduce habitat suitability for salmonid and non-salmonid species in Stevens Creek.

The EIR identifies mostly marginal improvements in habitat available to the non-salmonid species it analyzes; several potential negative outcomes of the Proposed Project are acknowledged but inappropriately minimized or dismissed. For example, the EIR states: "The Proposed Project would result in increased habitat [for Riffle Sculpin] during Winter Base Flow Operations and decreased habitat during the summer releases. Decreases in wetted area could occur during May, which could dry out habitat occupied by riffle sculpin fry and force fry to relocate or strand. The increases in riffle sculpin rearing habitat in winter and decreases in summer likely offset." (EIR 3-231.) The assertion that negative effects in one season are offset by projected minor increases in Riffle Sculpin habitat in other seasons is unsupported and speculative. Riffle Sculpin do not migrate out of their natal habitat – if the Proposed Project causes more of the river to dry up or become too hot during some months, then there will be less habitat for the population to live in; also, the planned

increases in suffocation and stranding of fish during particular seasons is not consistent with the need to maintain health of fish individuals as part of maintaining fish in good condition. The EIR does not present evidence that Riffle Sculpin populations are not and will not be limited by loss of habitat in the late spring (no "limiting factors analyses" for Riffle Sculpin is mentioned); thus, the EIR cannot simply presume that projected slight increases in habitat in other months will offset declines in critical spring and summer months. Indeed, if habitat area is limiting this species, then expanding habitat in a given season might lead to an increase in the population, but these additional fish will only exacerbate any shortage of habitat experienced later in the life cycle, when the Proposed Project is expected to limit habitat availability. The EIR inexplicably asserts that the benefits of the Proposed Project's flow measures outweigh the negative effects – but, as elsewhere, the EIR does not evaluate whether any assumed improvement to Riffle Sculpin habitat rises to the level that represents "fish in good condition." (Fish and Game Code § 5937.)

Similarly, with respect to Pacific Lamprey, the EIR downplays negative effects, overstates positive effects, and asserts that "the positives outweigh the negatives" without any supporting analyses. First, no mention is made of the Proposed Project's predicted effects on conditions for River Lamprey in Stevens Creek, even though the EIR admits that River Lamprey are known to occur in upper Stevens Creek under current conditions (EIR at 3-167). The EIR simply assumes, without evidence, that the status quo condition – low levels of River Lamprey detected in Stevens Creek – reflects the population status of River Lamprey in a world where Valley Water's dams released flow sufficient to maintain River Lamprey populations in good condition.

The EIR identifies the Guadalupe River as one of the "most important" locations for Pacific Lamprey in the Guadalupe Watershed (the only watershed in the Project Area that it analyzes). The EIR states that spawning and incubation habitat in this watershed "…would not be reduced by the Proposed Project in these locations." (EIR at 3-227.) The EIR notes: "Larvae rearing occurs year-round, and decreases in larvae rearing habitat in the summer could result in larvae becoming desiccated or suffocating if they are unable to relocate to wetted reaches." (EIR at 3-227.) And the EIR acknowledges that: "…decreases in flow and high temperatures during the summer would affect … the late stages of Pacific lamprey spawning and incubation in the Guadalupe River portion of the study area…. [except for] Calero Creek, where there would be decreased winter habitat." (EIR 3-229.) Nevertheless, despite the predicted negative effect on the health, diversity, and spatial distribution of Pacific Lamprey resulting from decreased flows and high summer temperatures in the Guadalupe River, the EIR declares, without further analysis, that "[o]n balance, the net benefits of implementing the flow measures outweigh the decreases in prespawning holding, spawning, and larvae rearing habitat in the summer for Pacific lamprey." (EIR 3-229.) Again, these statements do not address whether the Proposed Project will support Pacific Lamprey populations "in good condition" or simply maintain an inadequate status quo.

Similar assertions are made with regard to the Proposed Projects effects on Sacramento Hitch and, as mentioned above, the EIR fails to analyze current conditions or prospects for recovery of Sacramento Hitch on Steven's Creek or its estuary in San Francisco Bay.

Even for the limited group of fish that the Proposed Project intends to benefit (Steelhead and Chinook Salmon), the measures described are not likely to sustain populations at levels consistent with state and federal law because the flows described fail to substantially improve, and in fact

sometimes reduce migratory access and habitat for Chinook Salmon and Steelhead. Additionally, population levels are unlikely to be maintained because the Project area does not include the entire local geographic range that will be affected by the Project, even for the target species in question. In fact, with regard to Chinook Salmon in the Project Area, the EIR agrees that there will be little to no improvement:

> Based on the above analysis, changes in Chinook salmon adult upstream migration opportunities are likely to be negligible to slightly beneficial for the Chinook salmon population. Upstream adult passage days at POIs in the Guadalupe River saw few changes and continued to provide an average of 58 days of passage per year under the Proposed Project. Chinook salmon are able to spawn in the Guadalupe River or hold until passage opportunities present themselves at the upstream tributaries in the Guadalupe watershed (Valley Water et al. 2018; Moyle 2002). *Therefore, the Proposed Project is unlikely to affect the Chinook salmon population in a biologically meaningful way that differs from the current baseline*.

(EIR at 3-219, emphasis added.)[26]

The EIR's reliance on the belief that Chinook Salmon can hold "until passage opportunities present themselves" is misplaced. Unlike other runs of Chinook Salmon (e.g., Central Valley spring-run Chinook Salmon, or Sacramento winter-run Chinook Salmon), fall-run Chinook Salmon are largely ready to spawn as soon as they return to freshwater and do not typically delay their migrations for extended periods.[27] (SEP 2019.) Although spawning may still be successful among Chinook Salmon that experience migratory delays of short duration, impaired migration is stressful to these fish and associated with increased risk of predation and reduced spawning success.[28] (SEP 2019.) The EIR's reliance on the ability of migrating adult Chinook Salmon to delay migration in the face of environmental conditions that impair migration demonstrates that the Proposed Project is not intended to adequately support the migration beneficial use identified in the Basin Plan or the requirements of Fish and Game Code section 5937.

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[26] This admission that Chinook Salmon are unlikely to benefit from the Proposed Project appears at odds with the FAHCE Settlement Agreement, which provides: "This Agreement commits SCVWD and other Parties to a program of measures intended to restore and maintain fisheries, wildlife, water quality and other beneficial uses of the Three Creeks in good condition. The overall management objectives stated in paragraph 6.2.2 focus on Steelhead trout (*Oncorhynchos mykiss* [sic]) and chinook [sic] salmon (*Oncorhynchus tshawytscha*). *Since the Agreement is intended to restore both fisheries to good condition in the Three Creeks, the Agreement will not be interpreted or administered in a manner that favors one fishery to the detriment of the other. Accordingly, in construing and implementing this Agreement, the Parties will give equal consideration to both fisheries*. In adaptive management of a given measure as provided in paragraph 7.1, the Parties (through the Adaptive Management Team) may implement such measure in a manner which is more beneficial for one fishery than another, after due consideration of the criteria stated in paragraph 7.3." (Valley Water et al. 2003, Settlement Agreement at 6.2 (emphasis added).)

[27] Moyle, P.B., 2002. *Inland Fishes of California. Revised and expanded*. Berkeley: University of California Press (Moyle 2002).

[28] Healey, M.C., 1991. *Life history of Chinook salmon (Oncorhynchus tshawytscha)*. In: Pacific Salmon Life Histories, edited by Groot et al., 311-394 (Healey 1991); Quinn, T.P., 2005. *The behavior and ecology of Pacific salmon and trout*. Seattle: University of Washington Press (Quinn 2005).

The "Spring Pulse Flows" provided under the Proposed Project are also likely to be inadequate because they are only projected to occur in 50% of years. (EIR 2-18.) If the benefits attributed to these flows (described as increased migration success of adult Steelhead and increased juvenile migration success for Steelhead and Chinook Salmon) are essential to successful completion of the salmonid life cycle, and they only occur in half of years, then half the time migratory conditions will fail to support an essential component of the life-cycle. The EIR's description of the function of these pulse flows strongly suggests that migratory conditions for adult and juvenile Steelhead and Chinook Salmon may be inadequate in years when pulse flows are not triggered.

Further complicating the EIR's analysis, whereas juvenile Steelhead can remain in freshwater when there are not sufficient flows to open a migration corridor, they cannot avoid migrating indefinitely – providing flows necessary to support successful migration in half of years does not mean those flows will occur in every other year; as described, these pulse flows may not be provided during multiple consecutive years (not until reservoirs fill enough to trigger the pulse program); entire generations of Steelhead may be born and die in the intervening period. Chinook Salmon juveniles generally cannot remain in freshwater for several years waiting for flows that create adequate migration conditions. Thus, the spring flows provided under the FAHCE alternative appear to be generally inconsistent with maintaining fish in good condition and with providing adequate support to identified beneficial uses.

iii. The EIR Fails to Address Impacts to Fish Species Likely to Occur in the Impacted Watersheds

The EIR and the underlying FAHCE Agreement focus on the anadromous form of *Oncorhynchus mykiss*, known as Steelhead, and *Oncoryhnchus tshawytscha*, Chinook Salmon. The non-anadromous form of *O. mykiss* – resident Rainbow Trout – are not discussed in depth, despite the fact that Rainbow Trout give rise to Steelhead and vice-versa. In general, The EIR may be assuming that flows which benefit Chinook Salmon or Steelhead will also maintain resident Rainbow Trout in good condition. This assumption is not correct because, whereas salmon and Steelhead are migratory and mostly semelparous (they spawn once and then die), resident Rainbow Trout spend their entire lives in their natal tributaries and thus require access to adequate water quality conditions year-round, through their entire life span, and across generations.

The Proposed Project is not likely to maintain resident Rainbow Trout below some dams operated by Valley Water on tributaries to the Guadalupe River and Stevens Creek. Resident Rainbow Trout require access to cold water habitats, but coldwater management zones are not planned below Calero and Almaden Dams (EIR at Figure 2.2.2), despite the fact that *O. mykiss* are expected to spawn and rear there. (EIR 3-162.) By encouraging Steelhead to spawn in tributaries in which temperatures during the juvenile rearing season are expected to be unsuitable (e.g., because there is no plan for coldwater management), the Proposed Project may facilitate declines in population productivity and fish health that are inconsistent with the purposes of FAHCE and with the requirement to maintain fish in good condition below Valley Water's dams.

The EIR also fails to mention or analyze likely Project effects on Longfin Smelt. As is true elsewhere in the Estuary, it is very likely that spawning success and recruitment of larval and juvenile Longfin Smelt in the South Bay is a function of freshwater flow into the Bay from the larger

local rivers and creeks, such as Coyote Creek, Guadalupe River, and Stevens Creek. Historically, adult and larval Longfin Smelt have been detected in the waters off of Santa Clara County—near where Stevens Creek, the Guadalupe River, and Coyote Creek drain into San Francisco Bay—primarily during wet winters and/or springs. (CDFW 2010.)

Recent monitoring reveals that Longfin Smelt attempt to spawn in and near the confluence of Coyote Creek and the Guadalupe River with southern San Francisco Bay, particularly during years with wet winters and/or springs (Lewis et al. 2020). In years where runoff to the Bay from Coyote Creek and the Guadalupe River is high, high densities of larval and small juvenile Longfin Smelt are observed, including in the vicinity of restored salt ponds near the terminus of Coyote Creek and the Guadalupe River.[29] (Hobbs et al. 2019; Lewis et al. 2020.) Adults preparing to spawn and young Longfin Smelt larvae have also been detected at and near the terminus of these two waterways in the Alviso Marsh complex (Lewis et al 2019; 2020). However, fish sampling from 2011-2019 has confirmed that if Longfin Smelt reproduce successfully in this area, it is only during wet years when local freshwater inputs from the creeks and rivers of the Santa Clara Valley into the southern Bay are anomalously high. (Lewis et al. 2019b, 2020.) Specifically, Lewis et al. (2020 at p. 1) reported:

> From October through April, which encompasses the spawning season, and in all years from 2011 to 2019, we observed persistent and occasionally dense aggregations of adult Longfin Smelt in marshes and sloughs of the Coyote Creek watershed in the southernmost part of San Francisco Bay (Figs. 1b, 2a,b). Many of the adults were in late-stage spawning condition and expressed eggs and milt upon capture (Fig. 2c). Postlarval recruits (Fig. 2d) were also observed in April–May of 2017 and 2019, with each of these years characterized by anomalously high precipitation and freshwater outflow (and persistent low-salinity spawning and rearing habitat). *Thus, the potential for spawning was apparent in all years, whereas recruitment success appeared to be limited by freshwater outflow, as has been described for Longfin Smelt in the upper estuary* (Kimmerer 2002, Nobriga and Rosenfield 2016).

(Lewis et al. 2020 at p. 1 (emphasis added).)

Thus, it is very likely that maintaining Longfin Smelt in good condition in the estuarine environments of South San Francisco Bay will require winter-spring river flows into the Bay from the Guadalupe River, Coyote Creek, and potentially Stevens Creek, that are much higher than those that occurred in the majority of years between 2011 and 2019. But the EIR fails to mention Longfin Smelt or other estuarine fishes that will be affected by the Proposed Project, or their likely flow

[29] Lewis et al. 2019 describe their sampling locations for Longfin Smelt as follows: "The Alviso Marsh is located at the southern terminus of South San Francisco Bay and consists of two major tidal sloughs (Alviso Slough and Coyote Slough) fed by freshwater from the Guadalupe River and Coyote Creek respectively, tidal marsh, tidally restored and managed pond habitats totally approximately 9,600 acres (EDAW et al. 2007). Both tributary streams traverse through San Jose, CA, a highly urbanized area of the Santa Clara Valley (Silicon Valley) (Figure 1). The watershed covers approximately 1,240 km^2 and received an average of 50 cm of precipitation annually. Dams on the tributaries restrict flows to the marsh; currently over 75% of discharge is diverted for human consumption (Grossinger et al. 2007). Remaining surface flows from these tributaries are utilized for groundwater recharge by the Santa Clara Valley Water District." (Lewis et al. 2019 at 6.)

needs. Thus, the EIR ignores and fails to analyze the effect of the Proposed Project on this native, state-listed endangered species, or upon other native species that make use of the estuarine habitat formed by the outflow of Santa Clara Valley creeks.

iv. The EIR Finds that Several Identified Beneficial Uses Will Not Be Improved or Will Be Further Impaired Under the Proposed Project

The EIR, as well as many of the documents we cite in this comment letter, suggest that beneficial uses such as cold-water fish habitat (COLD), estuarine habitats (EST), spawning and early development of estuarine fishes (SPWN), migration of aquatic organisms (MIGR), wildlife habitat (WILD), and rare species (RARE) are not reasonably protected right now in Valley Water's service area generally and in the Project area specifically. The EIR's analyses reveal that some of these uses will not improve, or may even suffer, under the Proposed Project. For example, the EIR finds that habitats that support spawning and early development of Chinook Salmon adults will not be increased by the Proposed Project: "Based on the above analysis, most reaches [in the Guadalupe River watershed] would experience decreases in the absolute amount of available effective spawning habitat [for Chinook Salmon]." (EIR at 3-217.) According to the EIR, these decreases "are associated with increased water temperatures at the end of the incubation period…" (i.e., a reduction in the Coldwater Habitat beneficial use). (EIR at 3-216.) These statements also implicate California's Antidegradation Policy, which CEQA requires be taken into account as part of the EIR's analysis.

The EIR's explanation that spawning habitat may nevertheless be adequate to support increases in the population of Chinook Salmon is baseless and speculative. Effects of the Proposed Project on Chinook Salmon fry and juvenile rearing habitat include minor improvements in some waterways (e.g., 0.02%, or 300 square feet in the Guadalupe River) combined with a substantial decrease (15%) in Calero Creek. Declines in juvenile rearing habitat (presumably for juvenile fish that are larger than "fry") are expected in the Guadalupe River, Los Gatos Creek, and Calero Creek. (EIR at 3-218.) Similarly, the EIR anticipates that there will be little to no improvement in migration access to spawning habitats by adult Chinook Salmon (EIR at 3-219); this represents a decline in the MIGR beneficial use that has been identified for the Guadalupe River and its tributaries. SPWN is not currently reasonably protected in Valley Water's service area, and these EIR statements indicate no anticipated improvement in this beneficial use, and likely indicate continued degradation.

The EIR also reports declines in Steelhead habitat in Stevens Creek for fry rearing habitat during May (EIR at 3-193), juveniles rearing upstream during summer (EIR at 3-193), and passage of adult Steelhead in upper Stevens Creek (EIR at 3-194). Decreases in rearing habitat are generally attributed to loss of cold-water habitat under the Proposed Project as compared with the baseline. Reduced upstream access for migrating Steelhead adults is particularly concerning given that the Proposed Project intends to create cold-water refuge areas for juvenile and over-summering Steelhead upstream – if adults are constrained to spawning downstream, then their offspring would be required to migrate upstream in order to capitalize on any cold-water habitat the Proposed Project intends to maintain for them upstream. COLD is not currently reasonably protected in Valley Water's service area, and these EIR statements indicate no anticipated improvement in this beneficial use, and likely indicate continued degradation.

The EIR also identified declines and failure to improve Pacific Lamprey spawning habitat during four months of the six-month spawning and incubation period for this species compared with the current baseline (EIR at 3-196). This, too, fails to protect SPWN beneficial uses. Moreover, comparing the Proposed Project with the future baseline condition, the EIR finds "nearly identical increases" in effective spawning habitat, fry rearing habitat, juvenile rearing habitat, and adult migration for Steelhead and River Lamprey. In other words, the EIR identifies declines during 4 of those 6 months, and these declines implicate harm to beneficial uses. Furthermore, the EIR's finding of no significant difference means that the Proposed Project does not do anything, creates no improvement in conditions, and fails to meet the Project's purpose.

Moreover, the EIR identifies declines in Steelhead habitat in the Guadalupe River watershed including average decreases in juvenile rearing habitat in the Guadalupe River, Los Gatos Creek, Guadalupe Creek, and Calero Creek, with a marginal (1%) increase in such habitat in Alamitos Creek. (EIR at 3-209 to 3-210; 3-212.) Decreases in summer juvenile rearing habitat (e.g., a decrease of 34% on Guadalupe Creek) occur as part of operations titled "Summer Cold Water Program." Again, this implicates COLD beneficial uses.

The EIR additionally estimates that the Proposed Project will result in only marginal increases in passage opportunities for adult Steelhead in parts of the Guadalupe River watershed, including a 1 day per year increase in Guadalupe Creek, a 3 days per year increase in Alamitos Creek, and a 2 days per year increase in Calero Creek. This is counterbalanced by a predicted decrease in adult Steelhead passage opportunities in Los Gatos Creek. (EIR 3-210.) These results make clear that the Proposed Project does not significantly improve the already impaired migration and cold-water beneficial uses of several waterways in the Project Area.

Finally, as mentioned earlier in this comment letter, the EIR fails to consider impacts of proposed modifications to the flow regime of the Guadalupe River and Stevens Creek on spawning and juvenile rearing habitat (SPWN) of fish in the tidally-influenced, estuarine habitats of these waterways. Nor does the EIR address impacts to birds (e.g., Ridgways Rail) that may live in tidal marshes near the mouths of the Guadalupe River and Stevens Creek, and which may be impacted by changes in the distribution of fresh and brackish water habitats in the local estuary. Thus, the EIR fails to analyze impacts to the SPWN and RARE beneficial uses identified in the Basin Plan.

v. The EIR Estimates Habitat Availability Achieved Under the Proposed Project by Applying Incorrect Depth Requirements for Salmonids and Incorrect Temperature Tolerance Thresholds

The EIR does not apply environmental criteria for migrating adult salmonids consistently. In fact, some of the threshold criteria used to identify "optimal" conditions in various habitats do not match with the best available science. For example, in Appendix K, the EIR claims that adult Steelhead "require depths greater than 0.5 ft (Thompson 1972; Bell 1991), and velocities less than or equal to 8 feet per second (Thompson 1972; Bell 1991)." (EIR Appendix K, Fisheries and Aquatic Habitat Technical Memorandum, at 10.) However, in Appendix N, a depth criterion of ≥ 0.7 feet is applied "for evaluation purposes." (EIR Appendix N, Habitat Availability Estimation Methodology.) This latter depth criterion is used by CDFG (2013) as part of its evaluation of Steelhead ability to pass through "critical riffles." If the EIR's results are based on application of the 0.5-foot criteria,

then the EIR will overestimate fish-passable riffles by assuming that adult Steelhead can migrate through riffles that are too shallow. Furthermore, the velocity criteria identified in Appendix K implies that flow rates equal or close to zero cfs are acceptable for migrating Salmon. In reality, such low -flow conditions are far from optimal.

Appendix K's Fisheries and Aquatic Habitat Technical Memorandum does not identify minimum depth criteria for migration of adult Chinook Salmon. However, Appendix K's Habitat Availability Estimation Methodology indicates that a criterion of 0.9 feet was used to evaluate adult Chinook Salmon passage. This is the same value used in by the California Department of Fish and Game's (CDFG's) Standard Operating Procedure for passage of the "critical riffle" (or, shallowest riffle in the migratory corridor).[30] SEP (2019) points out that CDFG's critical riffle criteria are not meant to be minimum standards for passage of salmonids across their entire riverine journey and that repeated exposure to riffles that barely meet the CDFG critical riffle criteria would expose migrating adults to high levels of stress and predation and would not maintain fish in good condition. To account for repeated exposures to shallow water during adult migration in rivers, SEP (2019) amended the CDFG criteria (e.g., to a depth of 1.0 feet for Chinook Salmon, plus other requirements) for application across river migration paths. Thus, the EIR's use of 0.9ft minimum depth for adult Chinook Salmon and 0.7ft for Steelhead overestimates the passibility of creeks in the Project Area.

The EIR also overestimates Chinook Salmon and Steelhead temperature tolerances. This may lead to overestimations of passage opportunities and the habitats available for salmonids. Although salmonids may be able to tolerate temperatures higher than those identified in the EIR as "optimal," individual health and population viability are impaired by higher temperatures. Thus, by repeatedly misidentifying critical ecological thresholds, the EIR fails to address the impacts of both current operations and the Proposed Project on identified beneficial uses and the requirements of the California Fish and Game Code (e.g., § 5937).

The EIR states that a temperature threshold of 65°F was used to evaluate adult Chinook Salmon passage opportunities (EIR Appendix N at 45), even though it describes this temperature as the "upper tolerable" limit for holding Chinook Salmon (the EIR acknowledges that temperature thresholds for actively migrating salmonids are lower). A recent literature review of temperature criteria for migrating salmonids identifies 65°F daily temperatures as on the high end of "stressful" to adult Chinook Salmon and Steelhead, whether they are actively migrating or holding. Indeed, such temperatures are associated with complete or nearly complete loss of reproductive success if they persist over a week's time. (i.e., exposure to such temperature conditions is considered "detrimental"; SEP 2019.) USEPA (2003) identifies elevated risk of disease spread at weekly average temperatures between 57.2°F to 62.6°F: during May and June of this year (2021), endangered winter-run Chinook Salmon experienced elevated pre-spawn mortality when exposed to temperatures in this range.[31]

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[30] California Department of Fish and Game, 2013. *Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California, DFG-IFP-001*, October 2012, updated February 2013. Prepared by M.E. Woodard, Quality Assurance Research Group, Moss Landing Marine Laboratories. (CDFG (2013).)

[31] *See* "Discussion" tab in "2021 Winter-run Chinook Update File," *available at* https://www.calfish.org/ProgramsData/ConservationandManagement/CDFWUpperSacRiverBasinSalmonidMonitoring/tabid/357/Agg2208_SelectTab/4/Default.aspx.

In any case, there is no disagreement that frequent exposure of adult salmonids to high temperatures is harmful to their health and population viability and thus, the EIR's 65°F evaluation threshold does not represent temperatures consistent with the cold-water habitat beneficial uses or with maintaining fish in good condition. The EIR inappropriately suggests that Chinook Salmon and Steelhead in the Project Area may be locally adapted to higher temperatures than fish elsewhere, citing Zillig et al 2021 – but Zillig et al. 2021 provides no information regarding temperature tolerances of Steelhead in the Project Area and provides only anecdotal evidence regarding upper temperature thresholds for adult Central Valley fall-run Chinook Salmon (from which the EIR asserts that Chinook Salmon in the project area are derived); these anecdotes do not reveal that adult Central Valley fall-run Chinook Salmon are more tolerant of high water temperatures than adult Chinook Salmon from other watersheds.

In addition, whereas the EIR considers water temperatures as high as 56°F to be optimal for Chinook Salmon egg incubation, temperatures this high are known to result in some temperature-dependent egg mortality. The best available science on this topic is US EPA 2003 (which the EIR cites) and Martin et al. (2016),[32] which the EIR does not cite. (*See also* SEP 2019.) Similarly, the EIR overstates the upper optimal temperature bound for Steelhead egg incubation. (*See* SEP 2019 (best available estimates of Steelhead egg temperature thresholds).)

By contrast, the EIR's choice of an upper threshold for optimal rearing conditions for juvenile Steelhead (65°F) appears to be too low. This may result in an underestimate of juvenile rearing habitat available under the baseline and, potentially, an overemphasis on the benefits of the Proposed Project's storage of cold-water during the winter and spring for later release during the summer. According to SEP (2019), "[s]upportive temperatures for *O. mykiss* juvenile growth occur between 15°C to 19°C (59°F to 66.2°F); Moyle 2002; Richter and Kolmes 2005)." (SEP (2019) at 149-150.)[33] SEP (2019) also notes that higher temperatures in rearing habitats is correlated with anadromy versus residency (where access to marine environments is available) in juvenile *O. mykiss*.[34]

e. Cumulative Impacts – The EIR fails to Analyze the Effects of the Entire Project

Cumulative impacts that should be evaluated include the impacts from the seismic retrofits, from the Anderson Dam rebuild, and from the other flow projects that will have to be constructed in Valley Water's service area in order to meet wildlife flow requirements.

The FAHCE Settlement Agreement applies to three creeks where environmental conditions are largely under the control of Santa Clara Valley Water District, via operations of its dams: the

[32] Martin, B.T., A. Pike, S.N. John, N Hamda, J. Roberts, S.T. Lindley, and E.M. Danner. 2016. *Phenomenological vs. biophysical models of thermal stress in aquatic eggs*. Ecology Letters. doi: 10.1111/ele.12705 (Martin et al. (2016)).
[33] Richter, A., and S.A. Kolmes, 2005. *Maximum Temperature Limits for Chinook, Coho, and Chum Salmon, and Steelhead Trout in the Pacific Northwest*. Reviews in Fisheries Science 13:23-49. https://doi.org/10.1080/10641260590885861 (Richter and Kolmes 2005).
[34] Kendall, N.W., J.R. McMillan, M.R. Sloat, T.W. Buehrens, T.P. Quinn, G.R. Pess, and R.W. Zabel, 2014. *Anadromy and residency in Steelhead and rainbow trout Oncorhynchus mykiss: a review of the processes and patterns*. Canadian Journal of Fisheries and Aquatic Sciences 72:1-24. https://doi.org/10.1139/cjfas-2014-0192 (Kendall et al. 2014).

Guadalupe River, Stevens Creek, and Coyote Creek, as well as their tributaries. But the EIR analyzes implementation of the FAHCE Agreement only on the former two waterways. Analysis of FAHCE Agreement implementation in the Coyote Creek drainage is analyzed in a separate EIR, describing the reconstruction of Anderson Dam. This denies the interrelationship of implementing the FAHCE Agreement in the two adjacent watersheds and fails to provide the public with adequate information regarding the cumulative impacts of this program. For example, these creeks are located close enough to each other that emigration/immigration of fish and wildlife populations is likely – each creek may serve as a source or sink for organisms in the other creeks (including, but not limited to, the target species). Thus, the effects of FAHCE implementation on fish and wildlife populations in the three creeks should be studied together, in an integrated fashion.

Furthermore, some effects of the FAHCE implementation can only be understood in a EIR that integrates actions and outcomes from all three creeks. For example, each of these three creeks drains to southern San Francisco Bay, and the rate and timing of freshwater flow to the Bay affects numerous estuarine water quality conditions, including salinity, turbidity, currents, the density of food organisms, and (potentially) water temperature. In turn, these estuarine water quality conditions affect the spawning and success of fish and wildlife that spawn in or migrate through the estuary (including juvenile and adult Chinook Salmon and Steelhead). These effects cannot be understood unless the timing and volume of freshwater flow inputs from these three major tributaries to South San Francisco Bay are analyzed together.

f. Alternatives and Flow Regimes

With the goal of "foster[ing] informed decisionmaking and public participation," CEQA mandates that an EIR "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." (CEQA Guidelines § 15126.6(a).) In addition, the EIR must separately evaluate the "specific alternative of 'no project'" and the environmental impacts of not approving the proposed project. (*Id*. § 15126.6(e)(1).) The no-project analysis should reflect "what would reasonably be expected to occur in the foreseeable future if the project were not approved." (*Id*. §§ 15126.6(e)(2).)

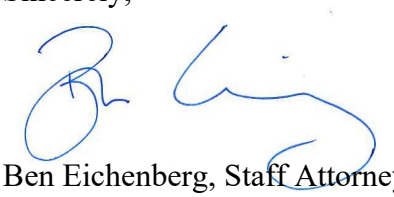
The EIR has failed to include a reasonable range of alternatives, particularly because it failed to include a range of alternatives that achieve the standards of the Fish and Game Code and the other environmental laws discussed herein, consistent with FAHCE objectives, and includes no alternatives that purport to accomplish sustainable fish populations. An alternative that includes improved flows and targets sustainable fish populations would have substantial environmental benefits, consistent with the overarching goals of FAHCE, and the failure to include such an alternative violates CEQA. (*See Citizens of Goleta Valley v. Board of Supervisors*, 52 Cal.3d 553, 566 (1990) (EIR must consider a reasonable range of alternatives that offer substantial environmental benefits and may feasibly be accomplished).)

V. CONCLUSION

It has been roughly 25 years since the deficiencies purportedly addressed in Valley Water's EIR were first pointed out to the water agency. With that amount of time to prepare the Proposed

Project, the EIR's many omissions and inadequacies come as a surprise. The EIR's haphazard implementation and incomplete analysis cannot satisfy CEQA's rigorous requirements, and Baykeeper urges Valley Water to address the many issues highlighted here before proceeding with the Proposed Project.

Sincerely,



Ben Eichenberg, Staff Attorney (He/Him)
San Francisco Baykeeper 1736 Franklin Street, Suite 800 | Oakland, CA 94612
Office: 510-735-9700 x105
baykeeper.org

FIGURE 1 (https://www.dfg.ca.gov/delta/data/fmwt/indices.asp)

Longfin Smelt (all ages)

Year	Sept	Oct	Nov	Dec	Total
1967	15484	49992	7480	8781	81737
1968	1408	771	446	654	3279
1969	35797	9845	7851	5857	59350
1970	889	410	1056	4160	6515
1971	2388	5722	5019	2774	15903
1972	138	118	106	398	760
1973	2794	1237	808	1057	5896
1974					
1975	318	598	1198	705	2819
1976	15	12	90	541	658
1977	29	17	83	81	210
1978	1744	1173	1450	2252	6619
1979					
1980	15233	6071	3526	6354	31184
1981	222	398	179	1403	2202
1982	7898	13961	28171	12875	62905
1983	152	3106	5407	3199	11864
1984	328	2612	2551	1917	7408
1985	20	31	219	722	992
1986	972	1543	1857	1788	6160
1987	134	70	384	932	1520
1988	16	17	207	551	791
1989	11	32	37	376	456
1990	10	1	81	151	243
1991	8	7	27	92	134
1992	3	0	12	61	76
1993	99	112	128	459	798
1994	4	10	79	452	545
1995	5430	931	1516	328	8205
1996	2	27	14	1303	1346
1997	106	51	194	339	690
1998	149	1578	2032	2895	6654
1999	1953	2736	331	223	5243
2000	1635	48	938	816	3437
2001	74	46	27	100	247
2002	127	144	182	254	707
2003	10	62	77	318	467
2004	44	9	9	129	191
2005	1	22	13	93	129
2006	1563	169	184	33	1949
2007	2	0	2	9	13
2008	0	19	43	77	139
2009	0	8	10	47	65
2010	2	7	4	178	191
2011	68	16	92	301	477
2012	6	2	17	36	61
2013	8	28	21	107	164
2014	6	3	5	2	16
2015	0	0	0	4	4
2016	3	0	2	2	7
2017	6	23	25	87	141
2018	13	5	8	26	52
2019	11	2	4	27	44
2020	0	0	22	6	28