July 6, 2017

Charlton H. Bonham, Director
California Department of Fish and Wildlife
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

RE: WATER FIX INCIDENTAL TAKE PERMIT APPLICATION FOR LONGFIN SMELT

Dear Director Bonham:

On behalf of The Bay Institute, the Natural Resources Defense Council, the Center for Biological Diversity, Defenders of Wildlife, and San Francisco Baykeeper, we are writing to request that the California Department of Fish and Wildlife (CDFW) reject the application (Application) for an incidental take permit for take of Longfin Smelt (*Spirinchus thaleichthys*) under the California Endangered Species Act (CESA) by the California WaterFix project (WaterFix). The application (i) fails to use the best available science, (ii) fails to demonstrate that issuance of the permit would not jeopardize the continued existence of longfin smelt, and (iii) fails to include measures to minimize and fully mitigate impacts of WaterFix on Longfin Smelt.[1]

WaterFix proposes to worsen Delta outflow conditions in the winter months and to partially maintain the frequency of existing outflow conditions (up to 44,500 cfs) during the March to

[1] We note that while this letter focuses on Longfin Smelt, we have not waived arguments regarding the adequacy or legality of CDFW issuing an incidental take permit for WaterFix to take Delta Smelt, winter run Chinook salmon, spring run Chinook salmon, or other species listed under CESA. Based on the review of the federal biological opinions by several of the signatories to this letter, we anticipate significant issues regarding these species as well. We hereby incorporate by reference our prior communications with CDFW, including but not limited to our 2013 and 2015 comments on the CEQA/NEPA documents for BDCP and WaterFix, and the February 24, 2017 letter to the U.S. Fish and Wildlife Service that was also sent to CDFW.

May period. However, the best available science demonstrates that these proposed Delta outflow conditions are wholly inadequate to minimize and fully mitigate the adverse impacts of WaterFix on Longfin Smelt, and that the construction and operation of WaterFix as proposed in the biological assessment will jeopardize the species' existence. Under CESA, CDFW cannot approve an incidental take permit unless the Director determines that: (i) take is minimized and fully mitigated (Cal. Fish & Game Code § 2081(b)(2); Cal. Code Regs., tit. 14, § 783.4(a)(2)); and (ii) issuance of the permit would not jeopardize the continued existence of the species (Cal. Fish & Game Code § 2081(c); Cal. Code Regs., tit. 14, § 783.4(b)). Because the WaterFix application fails to meet these requirements of CESA, the Department must reject the Application.

As proposed in the Application, WaterFix would exacerbate an already unsustainable situation for Longfin Smelt. In 2013, the Bay Institute *et al.* wrote to you presenting evidence that the existing incidental take permit was inadequate to protect Longfin Smelt and requesting that CDFW review and modify protections for Longfin Smelt under that permit. Since then, the fall midwater trawl longfin smelt abundance index has declined to 4 in 2015 (a new record low) and 7 in 2016. This ongoing decline demonstrates the inadequacy of existing regulatory protections, including those in the current Incidental Take Permit (ITP), and also demonstrates that prospects for this population's persistence and future recovery are worse today than when CDFW listed the species as threatened in 2009. Recent analyses of Longfin Smelt population dynamics in the San Francisco Bay estuary confirm the need to improve Delta outflow conditions to protect this species and to minimize and fully mitigate impacts of existing and proposed water project operations. Building on a wealth of studies that demonstrate a strong, persistent positive correlation between winter-spring Delta outflows and indices of Longfin Smelt abundance (e.g., Jassby *et al.* 1995; Kimmerer 2002; Rosenfield and Baxter 2007; Kimmerer *et al.* 2009, CDFW 2010b; Mac Nally *et al.* 2010; Thomson *et al.* 2010), Nobriga and Rosenfield (2016) determined that the mechanism behind this correlation is related to successful reproduction of Age 2+ Longfin Smelt (i.e., per capita production of Age 0 juveniles). The authors found no evidence that this relationship with Delta outflow has changed over the last approximately 35 years; no other factors explained the significant variance in Age2+→Age 0 recruitment dynamics. Indeed, the study found no evidence that this relationship changed after invasion of the estuary by the overbite clam (*Corbula amurensis*). The authors did detect a gradual decline in Age 0 to Age2+ survival rates; however, they noted that Longfin Smelt in this age range predominantly live downstream of Suisun Bay and the Delta. Thus, freshwater Delta outflow is a strong driver of inter-annual changes in Longfin Smelt abundance, this relationship has not changed over time, and improving Delta outflows remains one of the only measures known to be effective in protecting this species.

1. The Application Fails to Use the Best Available Science

To repeat, numerous scientific studies document that Delta outflow throughout the winter-spring months drives the abundance of Longfin Smelt in the Bay-Delta estuary. This is consistent with the fact that Longfin Smelt spawn in freshwater and/or low salinity environments (Jassby *et al.* 1995; Moyle 2002; Rosenfield and Baxter 2007; CDFW 2010a,b) during the winter and spring.

Also, Hobbs et al. (2010) found that successful recruits reared as larvae in low salinity habitats. Similarly, the CDFW life-history conceptual model of Longfin Smelt life history indicates that the two life stages that are most likely to be affected by Delta outflows, eggs and larvae, are present in the Delta and/or Suisun Bay from December-April and January-June respectively (CDFW 2010b); the conceptual model also notes the wide temporal distribution of Longfin Smelt spawning, egg, and larval life stages.

Indeed, there is no legitimate scientific dispute regarding the effect of winter-spring Delta outflow on subsequent Longfin Smelt abundance. CDFW itself has repeatedly acknowledged and supported the conclusion that Longfin Smelt abundance responds positively to winter-spring Delta outflows (CDFG 2010a,b; CDFG 2012a,b; CDFW 2016). For instance, in 2012 CDFW recommended that the State Water Resources Control Board (SWRCB) "provide low salinity habitat for longfin smelt in Suisun Bay (and farther downstream) by maintaining X2 between 64 km and 75 km between January and June" in order "to ensure annual production levels capable of sustaining and growing the Bay-Delta population" (CDFW 2012b). The California Department of Water Resources has also recently acknowledged that there is "strong positive relationship between longfin smelt fall midwater trawl (FMWT) abundance index and winter-spring outflow, suggesting that increased Delta outflow promotes conditions that increase survival of larvae and small juveniles during winter and spring, producing increased abundance during fall of the first year of life" (DWR 2016). The U.S. Fish and Wildlife Service previously acknowledged the numerous scientific studies supporting the finding that "Delta outflow during the winter and spring is the largest factor positively affecting longfin smelt abundance" (USFWS 2012). Furthermore, the SWRCB also recently found that "the abundance of juvenile longfin smelt in the fall is positively correlated with Delta outflow during the previous spawning season. Average daily outflows of 41,900 and 29,200-cfs in January-March and April-May are associated with positive population growth in half of all years" (SWRCB 2016; see also SWRCB 2010). In its comments to the SWRCB, CDFW stated clearly that the outflow period of greatest response was indicated to be January to June, that the flow needed to achieve 50% probability of population growth is not the same as the flows needed to achieve positive population growth in half the years, and that because of stock-recruit effects several consecutive good outflow years are needed to see a major population response (CDFW 2016).

Despite this overwhelming scientific evidence regarding the importance of winter-spring outflow, the Application proposes to worsen winter outflow compared with today, and it focuses analysis on the effects of spring outflow (March to May) on abundance of Longfin Smelt. Because it fails to consider the best available science regarding the importance of winter outflow, the Application largely ignores the adverse effects of reduced Delta outflow in the winter months. The failure to consider effects of outflow in the winter months and ensure that adequate outflow is provided in those months is all the more inexplicable because CDFW itself acknowledges that "(T)he outflow period of greatest response was indicated to be January to June" (CDFW 2016).

In addition, as a number of the signatories to this letter have noted repeatedly in comments on the Bay Delta Conservation Plan (BDCP) and WaterFix, the use of the Kimmerer 2009 equation to

evaluate the effects of Delta outflow on Longfin Smelt ignores the effect of the stock-recruit relationship for Longfin Smelt (Defenders of Wildlife *et al.* 2014; NRDC *et al.* 2015) and mistakenly assumes that the flow-abundance relationship is driven by the position of the low salinity field, and not some other flow-driven mechanism. CDFW (2016) has acknowledged the importance of prior abundance (stock) in determining the effects of outflow on Longfin Smelt abundance, writing that:

> Much of the abundance index variation around the regression line is attributable to parent stock size. Specifically, adults from a wet-year class will be more abundant and produce larger offspring year-class, regardless of water-year type, than those of a dry year-class (see Nobriga and Rosenfield 2016 for evidence of a stock effect). Thus, wet years occurring every two years for 2- or 3-year intervals will allow the population to build up and have sufficient adults to provide larvae to take advantage of favorable conditions. In this fashion the population can respond better than we have seen recently (i.e. since the late 1990s). For example, the 2011 cohort, which experienced a January to June average Delta outflow of ~58,000 cfs was 20 times the size of the 2009 cohort. This suggests that multi-year period of good flow conditions could actually result dramatic increase in the size of the population.

Because the analysis in the Application ignores the effect of prior abundance (stock), it fails to adequately analyze the potential impacts of WaterFix operations on the future abundance of Longfin Smelt. As discussed below, under existing conditions, consecutive years can result in very low Delta outflows that significantly reduce Longfin Smelt abundance; a series of such years could reduce the population to the point where it cannot rebound during wet years.

Moreover, the Application largely ignores the potentially adverse effect of increased water clarity/reduced turbidity resulting from WaterFix. Several studies have suggested that water clarity may be a significant covariate affecting Longfin Smelt abundance (Thomson *et al.* 2010; Mac Nally *et al.* 2010). WaterFix is likely to reduce sediment inputs to the Bay-Delta by nearly 10%, which would have significant adverse effects on turbidity in the Delta. Existing modeling, which was not considered in the Application or the NEPA/CEQA documents, demonstrates that WaterFix is likely to significantly increase water clarity in major portions of the Delta, particularly in combination with climate change (Achete *et al.* 2017, attached). Decreased turbidity and increased residence time in the Delta are also likely to increase the frequency of harmful algal blooms in the Delta (e.g., Berg and Sutula 2015). These harmful blooms are of increasing concern for fish and wildlife populations in the Delta and may affect Longfin Smelt in several ways (e.g., by increasing their susceptibility to predators or suppressing production of prey items), but the Application does not acknowledge this potentially serious outcome of WaterFix operations.

The Application also ignores the likely negative effects of reduced outflow on Longfin Smelt prey items, particularly zooplankton. The best available science indicates that outflows are correlated with production of several invertebrate prey species that are

believed to be important for sustaining Longfin Smelt populations and populations of other imperiled fish species (Jassby *et al.* 1995; Kimmerer 2002; CDFW 2010b; CDFW 2017*)*. As CDFW (2012b) itself has stated,

> Two native zooplankton species, the mysid shrimp (*Neomysis mercedis*) and the calanoid copepod (*Eurytemora affinis*), are particularly important in the diet of pelagic fishes such as delta smelt and longfin smelt. Both species have strong positive responses to spring (January–June) Delta outflow.

More recent analyses by CDFW demonstrate that outflow has a strong positive relationship to the catch per unit of effort (CPUE) of several zooplankton species, with far lower abundance of these prey items at lower outflow levels (CDFW 2017).

Finally, the Application largely ignores the effects of climate change by limiting its analysis to predicted 2030 climate conditions, which likely predates the actual date at which the WaterFix project would become operational.

2. The Application Fails to Demonstrate that Issuance of the Permit Would Not Jeopardize the Continued Existence of Longfin Smelt

The WaterFix Project will worsen Delta outflow conditions for Longfin Smelt. As NRDC et al (2015) noted in commenting on the WaterFix/BDCP RDEIR/SDEIS, Delta outflows under WaterFix will decline in most years:

> Using the modeling of Alternative 4 flows presented in Appendix B, we observe that freshwater Delta outflow aggregated from December to May will decline relative to the NAA during all but the Dry year type for Alt4_H3 and for all but the Dry and Below Normal year types for Alt4_H4. Thus, if operations under Alternative 4A are bracketed by estimated flows under operational variants H3 and H4, it is reasonable to believe that Delta outflows during the December-May period will decline in the majority of years and, as a result, Longfin Smelt populations will decline under Alternative 4A.

But even maintenance of status quo Delta outflows (e.g., the No Action Alternative in the RDEIR/SDEIS) represents a continuing dire threat to persistence of the Longfin Smelt population, since inadequate Delta outflows are the principle factor driving long-term declines in annual abundance indices. The status quo for Longfin Smelt is declining populations, which is inconsistent with CDFW's obligations under CESA.

The Delta outflows identified in the Application are woefully inadequate to prevent the continued decline and extinction of Longfin Smelt. Indeed, reduced Delta outflows under WaterFix would worsen conditions compared to the current Delta outflows required under existing state and federal permits, which are already demonstrably inadequate to protect Longfin Smelt and prevent their extinction. This is not only the overwhelming scientific consensus and

the consistently articulated warning of the signatories to this letter, but the opinion of state and federal regulators themselves. In 2012, USFWS (2012, *emphasis added*) found that Longfin Smelt warranted listing under the federal Endangered Species Act, concluding in that 12 month finding that:

> Given the observed negative association between the reduction of freshwater outflow and longfin smelt abundance, we consider the current reductions in freshwater outflow to pose a significant threat to the Bay-Delta DPS of longfin smelt. Based on the observed associations in the Bay-Delta between freshwater outflow and longfin abundance, the lack of effective control mechanisms, and projections of freshwater outflow fluctuations, we expect the degree of this threat to continue and likely increase within the foreseeable future. We conclude that lack of freshwater flow is a significant current and future threat to the Bay-Delta DPS of longfin smelt.

USFWS (2012) also concluded that:

> … the continued decline in longfin smelt trend indicators suggests that existing regulatory mechanisms, as currently implemented, are not adequate to reduce threats to the species. Therefore, based on a review of the best scientific information available, we conclude that existing regulatory mechanisms are not sufficient to protect the species.

The significant decline in Longfin Smelt abundance since USFWS's 12 month finding provides further evidence that existing Delta outflows are insufficient to prevent the extinction of Longfin Smelt, particularly during multiple dry year sequences.
In addition, reduction in Delta outflow will likely increase entrainment risk for Longfin Smelt at the South Delta export facilities, particularly during years at the drier end of the spectrum, (CDFG 2010b; Grimaldo *et al.* 2009); south Delta export operations will continue to pose an entrainment risk, particularly during drier year types, under WaterFix. Entrainment risk will increase as sea-level rise pushes the low salinity zone, where young-of-year Longfin Smelt aggregate, ever closer to the export facilities; the Application's failure to consider impacts after 2030 means that the full impacts of WaterFix under any number of climate change scenarios are seriously understated.

In conclusion, we urge you to reject the Application for an ITP regarding the take of Longfin Smelt by WaterFix, unless and until the Application includes significant increases in Delta outflow over the December to June period that are adequate to fully mitigate impacts and avoid jeopardizing the continued existence and recovery of the species. In addition, the existing ITP for take of Longfin Smelt by the State Water Project expires at the end of 2018, and we urge you to immediately begin the CEQA and CESA process in order that a new ITP ensures that impacts of the State Water Project and Central Valley Project on Longfin Smelt are fully mitigated and that project operations do not jeopardize the continued existences of the species.

Thank you for considering our comments on this extremely critical issue.

Sincerely,

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Cc: Carl Wilcox, Scott Cantrell, Chad Dibble, CDFW

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