WEST FALSE RIVER DROUGHT SALINITY BARRIER PROJECT

Delta Plan Certification of Consistency

Avoid Introductions of and Habitat Improvements for Invasive Non-native Species

ER P5 (Cal. Code Regs., tit. 23, § 5009)—Avoid Introductions of and Habitat Improvements for Invasive Nonnative Species

a) *The potential for new introductions of or improved habitat conditions for nonnative invasive species, striped bass, or bass must be fully considered and avoided or mitigated in a way that appropriately protects the ecosystem.*

b) *For purposes of Water Code section 85057.5(a)(3) and section 5001(j)(1)(e) of this Chapter, this policy covers a proposed action that has the reasonable probability of introducing or improving habitat conditions for nonnative invasive species.*

Summary

DWR has determined that the proposed product is consistent with Delta Plan Policy ER P5. The proposed project would not introduce non-native invasive species. The proposed project is also unlikely to improve habitat conditions for non-native invasive species because it has been designed and planned to limit the establishment of non-native and invasive species on site. Measures have been included in the construction best management practices and adaptive management plan to reduce the potential for detrimental invasions.

Invasive Aquatic Vegetation

Invasive aquatic vegetation, including submerged vegetation such as Brazilian waterweed (*Egeria densa*), provides habitat that is occupied less by delta smelt than are open-water habitats (Grimaldo et al. 2004; Ferrari et al. 2014). *Egeria* is the dominant submerged aquatic plant in the Delta and may reduce turbidity (with which delta smelt is positively associated) by slowing water velocity (Hestir et al. 2016). Irrespective of overall Delta hydrology and water operations, the drought salinity barrier could influence the occurrence of *Egeria* and other invasive aquatic vegetation by affecting water depth, turbidity, and channel velocity.

Kimmerer et al. (2019) hypothesized that the reduction in the speed of the current within Franks Tract with the 2015 emergency drought barrier (EDB) in place would lead to a more lake-like environment, increasing the biomass of submerged aquatic vegetation and changing its distribution. Kimmerer et al. (2019) compared maps of submerged aquatic vegetation produced in summer 2004 using airborne hyperspectral imagery over the Delta to corresponding maps produced in fall 2015–2017 to determine the immediate effect of the EDB on the extent and density of submerged aquatic vegetation. They concluded that the EDB may have helped submerged aquatic vegetation to gain a foothold where it had not been prevalent before, given the greater extent observed during and after installation and removal of the EDB. However, analysis of imagery in 2021 found that the 2021 barrier shifted the distribution of weeds within Franks Tract but did not increase overall coverage by weeds. Specifically, weed coverage increased on the west side of Franks Tract but decreased on the east side of the tract (Hartman et al. 2022).

Based on the observations from the 2015 EDB as studied by Kimmerer et al. (2019), it is possible that the drought salinity barrier (under all three installation scenarios) could cause an increase in the amount of invasive aquatic vegetation in portions of the Delta such as Franks Tract. Such an increase could have negative effects on delta smelt, such as by decreasing turbidity (Hestir et al. 2016) or reducing the availability of spawning habitat. Therefore, to address this potential effect, DWR will incorporate the following mitigation measure:

> **Mitigation Measure BIO-10: Remove Invasive Aquatic Vegetation.**
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> The spread of invasive aquatic weeds is an issue throughout the Delta, regardless of the presence or absence of the West False River drought salinity barrier. While the barrier is in place, DWR shall coordinate with the Aquatic Invasive Plant Control Program of the California Department of Parks and Recreation, Division of Boating and Waterways, for the control of invasive aquatic weeds near the barrier that are covered by the control program. DWR shall coordinate with the Division of Boating and Waterways on

implementation of treatment or removal strategies for covered invasive aquatic weeds near the barrier to the greatest extent practicable.

DWR has an ongoing contract with the California Department of Parks and Recreation, Division of Boating and Waterways to support their invasive aquatic weed control program. Documentation of this interagency contract is provided in the administrative record for this Delta Plan certification of consistency.

Non-native Fish Predators

Enhanced predation of juvenile salmonids in relation to artificial structures has been observed in the Delta (Sabal et al. 2016). Small fish, including juvenile salmonids, could be entrained toward the drought salinity barrier by seepage flows and then hold stationary in front of it to avoid being impinged on the rocks, resulting in concentrations of small fish near the barrier. Such concentrations of fish could attract piscivorous fishes.

To further understand predation impacts associated with the presence of a drought salinity barrier, DWR conducted a field predation study during construction activities for the 2021 EDB at West False River. The objectives of this study were to assess impacts of the drought barrier on predation rates of juvenile salmonids; examine relative predation rates associated with project activities (construction, closure, barrier modifications); determine whether the relative predation rate would increase once construction was complete; and examine the influence of the drought barrier on predation rate over time. The results suggest the existence of a zone of influence that increases predation risk within about 500 feet of the barrier (ICF ESA Joint Venture 2022). There is an apparent lag before this effect becomes discernible in the data, which may be attributable to the time needed for resident predatory fish to establish their territory around the barrier (ICF ESA Joint Venture 2022). Implementation of **Mitigation Measure BIO-10: Remove Invasive Aquatic Vegetation** would help to reduce the amount of aquatic invasive vegetation around the barrier, which can serve as habitat for predatory fish like largemouth bass.

Harmful Algal Blooms

DWR has conducted a study investigating cyanobacterial harmful algal blooms (cyanoHABs) in the Delta. CyanoHABs are more common in drought years than during wet years, likely because of high temperatures, residence time, and greater water clarity (Hartman et al. 2022). The presence of the drought salinity barrier would increase residence time and reduce water movement, further increasing the likelihood of cyanoHABs occurring in the area close to the drought barrier during drought years when the barrier is present. CyanoHABs have the potential to degrade water quality as a result of the release of microcystin, a cyanotoxin, in the water column. Other cyanotoxins in addition to microcystin are present in the Delta, and together these have the potential to affect fish and other biota in the Delta.

Blooms of cyanoHAB species such as *Microcystis* and concentrations of cyanotoxins are associated with dry years, with *Microcystis* visual index data indicating that there is a significantly higher incidence and abundance of cyanoHABs in dry years than in wet years (Hartman et al. 2022). In addition, a slightly higher incidence of *Microcystis* was observed in 2020 (a year without the drought barrier installed) than in 2021, when the barrier at West False

River was installed. When comparing visual *Microcystis* observation results with years when the barrier was present, there are no clear patterns between the presence and absence of the drought salinity barrier and elevated HABs. Additionally, measured cyanobacteria concentrations were higher in 2021 than in 2015, both years when the barrier was present; however, the 2015 data do not indicate that the barrier increased the potential for cyanoHABs.

Harmful effects of elevated microcystins can include impacts on the liver, kidney, gills, growth rate, and behavior of fish (Acuña et al. 2012a, 2012b; California Office of Environmental Health Hazard Assessment Ecotoxicology et al. 2009). Based on toxicity levels associated with microcystin data from low-water years when compared to levels observed in the Delta and Franks Tract with the presence of the 2015 and 2021 EDBs, impacts on sensitive fish would be less than significant.

References

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