State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Marine Region
1933 Cliff Drive, Suite 9
Santa Barbara, CA 93109
wildlife.ca.gov

GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

April 12, 2021

Adam Wagschal
Deputy Director
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030, Eureka, CA 95502
awagschal@humboldtbay.org

Subject: Hog Island Oyster Company Shellfish Farm in Arcata Bay
Recirculated Initial Study/Mitigated Negative Declaration
SCH# 2021020128

Dear Mr. Wagschal,

The California Department of Fish and Wildlife (Department) received the Recirculated Initial Study/Mitigated Negative Declaration (IS/MND) from the Humboldt Bay Harbor, Conservation and Recreation District for the Hog Island Oyster Company Shellfish Farm in Arcata Bay Project (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife resources. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that the Department, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

DEPARTMENT ROLE

The Department is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the state (Fish & Game Code, Section 711.7, subd. (a) & 1802; Pub. Resources Code, Section 21070; CEQA Guidelines Section 15386, subd. (a)). The Department, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife and habitat necessary for biologically sustainable populations of those species (*Id.*, Section 1802). Similarly, for purposes of CEQA, the Department is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources. The Department is also responsible for marine biodiversity protection under the

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

Marine Life Protection Act in coastal marine waters of California and ensuring fisheries are sustainably managed under the Marine Life Management Act.

The Department has the additional role of working toward the objectives of state policy declared in Fish & Game Code Section 1700, which includes, among others, the development of commercial aquaculture.

PROJECT DESCRIPTION SUMMARY

Proponent: Humboldt Bay Harbor, Recreation and Conservation District (Harbor District)
Objective: Hog Island Oyster Company (HIOC) proposes to install 30 acres of shellfish culture operation within 110 acres of leased intertidal mudflat in the northwest portion of Arcata Bay. HIOC proposes to grow three species of oyster: Pacific oysters (*Crassostrea gigas*), Kumamoto oysters (*C. sikamea*), and the native Olympia oyster (*Ostrea lurida*). The primary culture method would be intertidal longlines equipped with either SEAPA-type culture baskets or tipping bags (up to 27 acres), in addition to a small area of raised rack-and-bag culture (up to 3 acres). This new operation would complement HIOC's existing shellfish hatchery facility located near Samoa in Humboldt Bay.
Location: Northwestern tidelands of Arcata Bay adjacent to the Mad River Slough Channel (parcel 506-121-001-000).
Timeline: The proposed Project would be phased in over a five-year period.

BIOLOGICAL SIGNIFICANCE

Humboldt Bay is California's second largest Bay, and the largest estuary on the Pacific coast between San Francisco Bay and Oregon's Coos Bay. The marine and estuarine habitats of Humboldt Bay provide refuge and nursery habitat for more than 300 fish and invertebrate species, many with important commercial and recreational fisheries, and aquaculture value. Humboldt Bay and its wetlands and dunes are habitat for at least 20 State- and federally listed species and numerous California Species of Special Concern.

COMMENTS AND RECOMMENDATIONS

Pursuant to our jurisdiction, the Department offers the following comments and recommendations below to assist the Harbor District and HIOC in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife resources.

I. Special Status Species

Special status species that occur in the Project area and are listed under the California Endangered Species Act (CESA), Federal Endangered Species Act (ESA), or California Species of Special Concern (SSC) include:

- Coho salmon (*Oncorhynchus kisutch*), State and federally threatened (Southern Oregon/Northern California Coast (SONCC) Evolutionarily Significant Unit (ESU));
- Chinook salmon (*Oncorhynchus tshawytscha*), federally threatened (California Coastal ESU);
- Coastal cutthroat trout (*Oncorhynchus clarki clarki*), State SSC;
- Steelhead (*Oncorhynchus mykiss*), federally threatened (Northern California Distinct Population Segment (DPS)), State-endangered candidate (Northern California Summer Steelhead);
- Longfin smelt (*Spirinchus thaleichthys*), State-threatened;
- Green sturgeon (*Acipenser medirostris*), federally threatened (southern DPS), State SCC (northern and southern DPS);
- White sturgeon (*Acipenser transmontanus*), State SSC;
- Pacific lamprey (*Entosphenus tridentatus*), State SSC;
- Western river lamprey (*Lampetra ayresii),* State SCC; and
- Black brant (*Branta bernicla nigricans*), State SSC.

II. Project Impacts

Eelgrass Habitat

Comments: Native eelgrass beds (*Zostera marina*) are an important part of the Humboldt Bay ecosystem and are recognized by state and federal statutes as both highly valuable and sensitive habitats. Humboldt Bay holds approximately 31% of the known mapped eelgrass in the state (Merkel & Associates 2017). Eelgrass provides primary production and nutrients to the ecosystem along with spawning, foraging, and nursery habitat for fish and other species. Pursuant to the federal Magnuson-Stevens Fishery Conservation and Management Act, eelgrass is designated as Essential Fish Habitat for various federally managed fish species within the Pacific Coast Groundfish and Pacific Coast Salmon Fisheries Management Plans (FMP). Eelgrass is also considered a habitat area of particular concern for various species within the Pacific Coast Groundfish FMP. Eelgrass beds are further protected under state and federal “no-net-loss” policies for wetland habitats and are also listed by the Department as a Sensitive Natural Community with a vulnerable listing status (State Rank S3). Sensitive Natural Communities with rankings of S1-S3 are of limited distribution, often vulnerable to environmental effects of projects, and need to be assessed in the CEQA review process (CDFW 2018). Additionally, the importance of eelgrass protection and restoration, as well as the ecological benefits of eelgrass, is identified in the California Public Resources Code (PRC Section 35630).

The IS/MND provides maps of previous (2009) and recent (2020) eelgrass distribution in the Project area and states that eelgrass will not be impacted by Project activities. However, the proposed culture area overlaps with former distribution of continuous and patchy eelgrass habitat (based on aerial imagery from 2018 and surveys conducted in 2009). Humboldt Bay has experienced a loss of eelgrass habitat in recent years, with eelgrass receding as much as 25 feet per year near the South Bay State Marine

Recreational Management Area, possibly due to wasting disease and subsequent mudflat erosion (Gilkerson, pers. comm., 2021). Monitoring along the Mad River Slough transect line (north of the Project area) documented a nearly complete loss of eelgrass habitat in 2020 (Tyburczy, pers. comm., 2021). In other areas of the Bay, eelgrass habitat has expanded within the intertidal flats (Gilkerson, pers. comm., 2021). The Department is concerned that only considering existing eelgrass cover during placement of culture gear will fail to capture the spatial and temporal extent of eelgrass in the Project area and will limit eelgrass from returning to its previous distribution.

The Project proposes to avoid impacts to eelgrass habitat by incorporating a 5-meter (m) unvegetated perimeter ("buffer") from existing vegetated eelgrass cover. However, the 5-m perimeter recommended in the California Eelgrass Mitigation Policy (CEMP; NOAA, 2014) is considered an extension of potential eelgrass habitat, allowing for natural interannual fluctuations in spatial distribution, and is not considered a "buffer" from eelgrass habitat. The Department recommends that the Project incorporate a buffer between eelgrass habitat and aquaculture gear in addition to the 5-m perimeter to avoid impacts associated with, but not limited to, trampling, vessel operations, shading, and changes in hydrodynamics and sedimentation. Previous aquaculture projects in North Bay have included at least a 10-foot buffer between eelgrass and culture gear. The Intertidal Pre-Permitting Project proposed to include a 30-foot buffer (5-m unvegetated perimeter plus a 15-foot buffer) to avoid impacts to eelgrass habitat and the Coast Seafoods Expansion Project included a 25-foot buffer between rack-and bag culture and eelgrass beds. The IS/MND also states that eelgrass surveys shall be valid if performed within two-years of gear installation and does not propose to conduct post-installation eelgrass monitoring or mitigation. Given the recent dieback and high interannual variability in eelgrass distribution in Humboldt Bay, annual surveys are more appropriate. Following the CEMP guidelines, pre-installation eelgrass surveys should be completed within 60 days of gear installation and post-installation surveys should be completed within 30 days of completion. Additionally, the IS/MND does not provide any information regarding the proposed methods to conduct eelgrass surveys.

The Department is also concerned that impacts to eelgrass will occur from vessel operations given the widespread distribution of eelgrass in the subtidal channels adjacent to the culture areas that will likely be used for access. The Project proposes to avoid anchoring and routing vessels in areas containing eelgrass but does not provide a detailed map of proposed anchorage locations or vessel routes. In addition, recent modeling efforts in Humboldt Bay predict a substantial shoreward expansion of eelgrass onto intertidal mudflat habitat over the next 100 years in response to sea level rise inundation, particularly in the North Bay (Shaughnessy et al. 2012; Gilkerson 2013; and Stillman et al. 2015). The Department is concerned that aquaculture development and operations in the intertidal zone could limit eelgrass from expanding higher onto intertidal mudflats in response to sea level rise.

Recommendations: The Department recommends the proposed Project avoid and minimize impacts to eelgrass and fully mitigate for any remaining impacts. The

Department makes the following recommendations for the Final Mitigated Negative Declaration (Final MND):

Analysis of impacts to eelgrass and additional avoidance and minimization measures.

- It is unclear whether alternate locations within the leased area were considered for culture installation to better avoid impacts to eelgrass habitat. The Department recommends HIOC provide information regarding alternative gear placement or describe why it is not feasible. The Department also recommends HIOC disclose whether they or other entities plan to develop additional culture in the leased area in the future.
- Avoid areas that supported eelgrass in 2009 as well any additional eelgrass habitat mapped in recent or future years to account for temporal and spatial variability in distribution. This includes placement of aquaculture gear, access routes for vessels and walking, and vessel anchorage locations.
- In addition to the 5-m perimeter, include a 10-foot buffer between culture gear and eelgrass habitat. The Department recommends the Final MND include a map that overlays the proposed shellfish culture area, vessel anchorage locations, and vessel routes in relation to previous (2009) and current eelgrass distribution. The map should include both the 5-m perimeter and 10-foot buffer. The map should also include an accurate bathymetric chart.
- The Department is concerned culture gear may alter the hydrodynamics of the area such that eelgrass habitat within or in proximity to the action area may be adversely affected and recommends the Final MND include an analysis of how hydrodynamics may be altered.
- The Department recommends additional measures be included to avoid impacts from vessel operations, such as minimizing the degree of sediment mobilization from boats, avoiding propeller scarring in areas of eelgrass, and avoiding shading of eelgrass habitat with vessels.

A comprehensive eelgrass mitigation and monitoring plan.

- The Department recommends the following for the eelgrass mitigation and monitoring plan: 1) consider pre-installation surveys valid for one year; 2) complete post-installation eelgrass surveys within 30 days of construction completion; 3) conduct surveys during periods of high growth, as described in the CEMP (NMFS, 2014); and 4) provide proposed eelgrass survey methods within the Final MND. If using drone imagery, select a pixel resolution high enough to accurately quantify eelgrass habitat.
- Include in the eelgrass mitigation and monitoring plan mitigation for any impacts to eelgrass including, but not limited to, impacts from gear placement, trampling, boat propellers, changes in circulation from gear placement, and sedimentation to ensure no net loss.

- Adaptively manage aquaculture operations with resource and permitting agencies to avoid impacts to any new eelgrass habitat that may recruit to areas within the Project sites not actively used for cultivation.
- The Department recommends the Harbor District and HIOC consult with the resource and permitting agencies for review of all eelgrass monitoring, mitigation, and adaptive management efforts.

Non-Native Eelgrass

Comments: The non-native eelgrass (*Zostera japonica*) has been documented in several locations throughout Humboldt Bay (Schlosser et al. 2011). This species is known to grow higher in the intertidal than the native eelgrass (*Z. marina)* and thus may have more opportunities to interact with Project activities. This species has the potential to spread to additional areas due to trampling and boating activities that could break off intact turions for dispersal to new locations. Due to the ability of this species to rapidly colonize areas of unvegetated mudflat, the Department is concerned with the potential spread of this non-native species from Project activities. The IS/MND does not provide any discussion regarding *Z. japonica*.

Recommendations: The Department recommends the Final MND include a training and monitoring program to educate staff on how to identify, avoid, and monitor the non-native eelgrass species *Z. japonica*. The Department also recommends the Final MND include best management practices that could reduce the potential spreading of this plant to new locations. For instance, avoiding boating and traversing routes to aquaculture gear through areas with *Z. japonica.* If *Z. japonica* is detected within the Project area, HIOC should immediately notify the Department and other resource and permitting agencies.

Intertidal Mudflats

Comments: Intertidal mudflats provide habitat and foraging opportunities for fish such as longfin smelt, sturgeon, elasmobranchs, leopard sharks, shorebirds and waterfowl. Several species with important commercial and recreational fisheries value also exist within and adjacent to intertidal mudflat habitat that could potentially be impacted by the proposed Project, including Dungeness crab, rockfish, Pacific herring, and California halibut. The discussion in the IS/MND regarding impacts of culture structures on fish species, benthic fauna and habitat is generally limited to cultch-on-longline gear studies. Tipping bags are considerably different structures than cultch-on-longline gear and impacts from this type of gear should be considered.

Recommendations: The Department recommends the Final MND discuss impacts to mudflat habitat and species specifically from tipping bags. If there is insufficient literature regarding the impacts associated with tipping gear, the Department recommends HIOC develop and implement a monitoring program to assess the impacts of innovative oyster culture gear, such as tipping bags, on fish, bird, and invertebrate assemblages in the

Project area. The Department recommends the monitoring program be used to evaluate: 1) impacts to mudflat habitat from changes in elevation caused by altered erosion and deposition processes; 2) changes to infauna composition and the subsequent impacts to shorebird and fish food resources; and 3) reduction in foraging areas for shorebirds, waterfowl and fish species, such as black brant, salmonids, bat rays, sturgeon, leopard sharks and longfin smelt. Development of the intertidal mudflat monitoring program should be done in consultation with the Department and other permitting and resource agencies.

Green Sturgeon

Comments: The IS/MND inaccurately states that observations by the National Marine Fisheries Service and U.S. Fish and Wildlife Service during a field visit in 2016 confirmed green sturgeon feeding did not extend into the Mad River Slough area. However, aside from Sand Island, the Mad River Slough area had the most activity on the acoustic receiver during the 2016 field visit, but due to equipment difficulties, this location was not fully surveyed (Goldsworthy, pers. comm., 2021). The 2016 field visit also confirms that green sturgeon frequents the higher elevation areas of the intertidal zone to feed (Goldsworthy et al. 2016). In 2007-2008, approximately 200 sturgeon detections were recorded near the Mad River Slough area and breaching in this area has been repeatedly observed (Goldsworthy, pers. comm, 2021). Previous intertidal longline operations, including the Coast Seafoods Expansion Project, implemented a 10-foot buffer between culture plots and subtidal channels to minimize risks to sturgeon and other species foraging on intertidal mudflats.

Recommendations: To reduce impacts to green sturgeon, the Department recommends a buffer distance of at least 10-feet between culture gear and subtidal channels. This buffer would also provide benefits to eelgrass and other fish species foraging along the subtidal and mudflat interface.

Naturalization of Non-native Cultured Species

Comments: The Department is concerned with the potential for non-native cultured shellfish to naturalize outside of cultivation areas and impact native marine species. Contrary to what is stated within the IS/MND, there is evidence that feral oysters occur outside of farmed areas. Department staff have observed wild Pacific oysters broadly across the North Bay, including within the Mad River Slough area (Ray, pers. comm., 2021). Over the past two decades, this species has colonized all the San Diego County estuarine systems (Crooks et al. 2015). In Europe, rising temperatures appear to cause an increase in the frequency and fecundity of non-native Pacific oysters, and their potential to displace native species and modify habitat has become a management concern (Herbert et al. 2012; Herbert et al. 2016). As sea temperature rises, spawning events in Humboldt Bay may become more frequent and result in further colonization of non-native cultured species.

Recommendations: The Department recommends the Final MND include updated information regarding detections of cultured species outside of cultured areas, the potential for increased naturalization from this Project, and the ecological impacts naturalization could have on the natural community. The Department also recommends the Final MND include avoidance, minimization, and mitigation measures to reduce the potential for naturalization of cultured species.

Pacific Herring

Comments: The Department appreciates that the Project proposes measures to protect Pacific herring (*Clupea pallasi*) spawn. The Department has developed a thorough herring egg monitoring and consultation process from previous projects, such as the Coast Seafoods Expansion Project, that provides further protection than the proposed mitigation measure.

Recommendations: The Department recommends that the following measures are included within the Final MND:

<u>Herring egg monitoring and consultation with the Department.</u>

- The Department recommends all employees who supervise work on the tidelands are trained by a Department biologist to conduct pre-work herring spawn surveys. During the months of December through March, trained employees should perform a pre-work herring spawn survey at each location where work is scheduled to take place to determine whether herring have spawned on eelgrass, culture materials, or substrate. If herring spawn has been recently observed by the employees or Department staff on or in the immediate vicinity of planned planting and/or harvesting activities, shellfish farmers should: (1) postpone planting and/or harvesting activities on any culture beds in those areas for two weeks, or until Department staff confirm herring eggs have hatched; and (2) notify the Department's Eureka Marine Region contact within 24 hours (see contact information below) of the spawn within 24 hours. HIOC should keep records of when the Department was notified of spawning events.

Black Brant and Shorebirds

Comments: Black brant occur in Humboldt Bay as spring and fall migrant and winter visitors. Humboldt Bay is the most important area in California for this species, due in part to the health and size of eelgrass habitats found in the Bay. Humboldt Bay is also an internationally important site for overwintering and seasonally migrating shorebirds. Recent surveys (2018-2019) estimate that over one million shorebirds from 52 recorded species utilize the Bay throughout the year (Colwell et al., 2020). Many species rely on mudflat habitats for feeding, resting and/or roosting. The Department is concerned that persistent human disturbance, such as increased boat traffic to the Project area from the existing HIOC facility (4 miles away) and human activities associated with shellfish culture, in addition to loss of foraging habitat could impact brant and shorebirds utilizing the Project area.

The IS/MND does not sufficiently discuss the potentially significant impacts to shorebirds, brant and other waterfowl from increased human disturbance. The Project proposes to implement best management practices to avoid approaching, chasing, flushing, or directly disturbing shorebirds, waterfowl, seabirds, or marine mammals, but does not provide information on how this will be implemented. The IS/MND cites that a recent brant monitoring study in Humboldt Bay found no significant difference in brant usage of culture plots versus adjacent reference plots (H.T. Harvey & Associates, 2018). However, the baseline data collected for the referenced study had a 50% camera failure rate and warrants further study. Stillman et al. (2015) found that small decreases in eelgrass abundance and small increases in disturbance can have population-level consequences for brant, and that any reduction in eelgrass within Humboldt Bay could adversely affect successful migration.

Recommendations: The Department recommends the Final MND include a quantitative analysis of both the loss of foraging opportunity and the increase in disturbance along with the cumulative impacts to black brant and shorebirds when both stressors occur simultaneously. The Department recommends additional avoidance and minimization measures are included in the Final MND to reduce impacts to brant and shorebirds, such as minimizing the number of boat trips, establishing vessel routes that reduce disturbance and establishing an appropriate buffer between roosting habitat and aquaculture gear.

Mad River Slough Wildlife Area & Recreational Users

Comments: The Project area is located directly east of the Mad River Slough Wildlife Area, which is owned and managed by the Department, and is heavily used for waterfowl hunting and wildlife observing. The Project is also located near a public access point that is used for recreational fishing, clamming, waterfowl hunting, and boating opportunities. The Department is concerned that the proposed Project may have potentially significant impacts to recreational users and the wildlife on which they depend. The IS/MND does not provide an analysis of potential impacts to recreational users.

Recommendations: The Department recommends the Final MND includes an analysis of Project impacts to waterfowl hunting, including: 1) decreases in waterfowl available for harvest; 2) the loss of hunting opportunities due to disturbance from boats and aquaculture personnel; 3) the loss of hunting opportunities due to physical obstruction of traditional hunting areas; and 4) increases in hazards to boaters from aquaculture gear. To avoid and minimize impacts to waterfowl hunters, the Department recommends the Project limit culture operations that impact bird behavior on hunting days (Wednesday, Saturday, and Sunday) during the waterfowl hunting season. The Department also recommends the Final MND include an analysis of Project impacts to recreational fishing, wildlife observing, and boating. The Final MND should also provide details on how the lease area will be clearly marked (i.e., number of marker posts, spacing between posts) and how markers will be maintained to ensure the safety of all recreational users.

Marine Debris

Comments: The Department is concerned that additional aquaculture operations in the Bay could result in an increased presence of marine debris. The Department appreciates that the IS/MND includes a Marine Debris Management Plan (Appendix A). The Project proposes to mark or brand HIOC's contact information on floating bags or baskets but does not disclose whether other types of gear (i.e., rack-and-bag) will be marked.

Recommendations: All culture gear should be marked or branded with HIOC's contact information. The Department requests an annual report from HIOC regarding the volume and type of shellfish gear collected during cleanup events and recommends that it also be sent to appropriate permitting agencies. If consistent discoveries of certain gear types are made during cleanup events by HIOC or the public, HIOC should evaluate (and if feasible, implement use of) alternative gear types or practices that would reduce these consistent sources of debris.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code, § 21003, subd. (e)) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be found at the following link: https://wildlife.ca.gov/Data/CNDDB/Submitting-Data#44524419-online-field-survey-form. The completed form can be submitted electronically or mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov.The types of information reported to CNDDB can be found at the following link: https://wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

FILING FEES

The Project, as proposed, would have an impact on fish and wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by the Department. Payment of the fee is required for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089)

CONCLUSION

The Department appreciates the opportunity to comment on the Hog Island Oyster Company Shellfish Farm in Arcata Bay Project IS/MND to assist the Harbor District and HIOC in identifying and mitigating Project impacts on biological resources. Questions

regarding this letter or further coordination should be directed to Corianna Flannery, Environmental Scientist at 707-499-0354 or Corianna.Flannery@wildlife.ca.gov.

Sincerely,

DocuSigned by:
343995CB95354BC...
Craig Shuman, D. Env.
Marine Regional Manager

cc: Office of Planning and Research, State Clearinghouse
state.clearinghouse@opr.ca.gov

ec: Becky Ota, Environmental Project Manager
California Department of Fish and Wildlife
Becky.Ota@wildlife.ca.gov

Eric Wilkins, Senior Environmental Scientist Supervisor
California Department of Fish and Wildlife
Eric.Wilkins@wildlife.ca.gov

Corianna Flannery, Environmental Scientist
California Department of Fish and Wildlife
Corianna.Flannery@wildlife.ca.gov

Sara Briley, Environmental Scientist
California Department of Fish and Wildlife
Sara.Briley@wildlife.ca.gov

Randy Lovell, Aquaculture Coordinator
California Department of Fish and Wildlife
Randall.Lovell@wildlife.ca.gov

Shawn Fresz, Lands and Wildlife Program Supervisor
California Department of Fish and Wildlife
Shawn.Fresz@wildlife.ca.gov

Charles Bartolotta, Wildlife Habitat Supervisor II
California Department of Fish and Wildlife
Charles.Bartolotta@wildlife.ca.gov

Scott Bauer, Senior Environmental Scientist Supervisor
California Department of Fish and Wildlife
Scott.Bauer@wildlife.ca.gov

Cassidy Teufel, Senior Environmental Scientist (Specialist)
California Coastal Commission
Cassidy.Teufel@coastal.ca.gov

Matt Goldsworthy, Fisheries Biologist
National Marine Fisheries Service
Matt.Goldsworthy@noaa.gov

Kasey Sirkin, Lead Biologist
U.S. Army Corps of Engineers
L.K.Sirkin@usace.army.mil

Cashell Villa, Project Leader
Humboldt Bay National Wildlife Refuge
U.S. Fish and Wildlife Service
cashell_villa@fws.gov

Habitat Conservation Project Branch CEQA Project Coordinator
California Department of Fish and Wildlife
ceqacommentletters@wildlife.ca.gov

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