Final Environmental Impact Report for the Humboldt Bay Mariculture Pre-Permitting Project

Volume 2

Response to Public Comments
And
Mitigation Monitoring and Reporting Program

SCH #2013062068

Humboldt Bay Harbor, Recreation and Conservation District
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8 February 2016

Introduction

This Final Environmental Impact Report (EIR) has been prepared to respond to comments received on the Humboldt Bay Mariculture Pre-Permitting Project's Draft EIR., which was distributed for public review and comment in January 2015. The comment period was from January 23 through March 12, 2015 and a public comment meeting was held on March 4, 2015.

As set forth in the CEQA Guidelines Section 15132, the Final EIR shall consist of:

- The Draft EIR or a revision of the Draft;
- Comments and recommendations received on the Draft EIR either verbatim or in summary;
- A list of persons, organizations, and public agencies commenting on the Draft EIR;
- The responses of the lead agency to significant environmental points raised in the review and consultation process; and
- Any other information added by the lead agency.

Volume 1 contains the Final EIR (revised Draft EIR), which includes the CEQA-required information and analysis, and into which the changes to the Draft EIR (described below) have been incorporated in an "underline / strike-through" format. Following are the public's comments on the DEIR in their entirety, responses to comments, and the EIR's Mitigation Monitoring and Reporting Program. This document (Volume 2) is organized as follows:

- Section 1 contains public comments.
- Section 2 contains individual and master responses to the public comments.
- Section 3 is the Mitigation Monitoring and Reporting Program.

Written comment letters were received from the following agencies/individuals during the comment period.

- National Marine Fisheries Service (NMFS)
- Coastal Aquaculture Planning and Environmental Sustainability Program (CAPES)
- Pacific Flyway Council
- Audubon California, EarthJustice, Oceana, Redwood Region Audubon Society
- Ken Bates
- Humboldt Baykeeper, Northcoast Environmental Center
- Matt Brinkman
- California Coastal Commission
- California Department of Fish and Wildlife
- City of Eureka
- Scott Frazer
- Steven Grantham
- Hog Island Oyster Company
- Jon Lee
- Pacific Outfitters
- Thomas Peters
- Ted Romo
- California Department of public Health
- Jeff Todoroff
- Casey Allen
- HSU Department of Biological Sciences (Frank Shaughnessy PhD, Joe Tyburczy PhD, Jeffrey Black PhD)

Section 1: Public Comments

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

MAR 0 9 2015

In response refer to:
WCR-2015-AR00067

Mr. Jack Crider
Chief Executive Officer
Humboldt Bay Harbor, Recreation, and Conservation District
P.O. Box 1030
Eureka, California 95501

Dear Mr.Crider:

This letter constitutes NOAA's National Marine Fisheries Service (NMFS) comments on the Draft Environmental Impact Report for the Humboldt Bay Mariculture Pre-permitting Project (DEIR), released January 23, 2015 for a 45-day comment period. Within Humboldt Bay, the Humboldt Bay Harbor, Recreation and Conservation District (HBHRCD) proposes to lease approximately 527 acres of intertidal areas for commercial off-bottom shellfish aquaculture, 21 acres of channel areas for subtidal shellfish and macroalgae culture, and to oversee the operations on the leases (Project). In order to streamline the regulatory process for lessees and to facilitate aquaculture expansion in Humboldt Bay, the HBHRCD will obtain all necessary local, state and federal permits for the Project.

NMFS 1

The Project location lies within the jurisdiction of the NMFS West Coast Region California Coastal Area Office (CCO), and will require a U.S. Army Corps of Engineers (Corps) permit. NMFS is the lead federal agency responsible for the stewardship of the nation's offshore living marine resources and their habitats; and implements the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and the Marine Mammal Protection Act (MMPA) to fulfill its mission of promoting healthy ecosystems. Federally-managed living marine resources provide an important source of food and recreation for the nation, as well as thousands of jobs and a traditional way of life for many coastal communities, healthy ocean populations and ecosystems. NMFS also plays a central role in developing and implementing policies that enable marine aquaculture and works to ensure that aquaculture complies with existing federal laws and regulations that NOAA implements under its marine stewardship mission.

NOAA's aquaculture goals and objectives as outlined in both the Department of Commerce and NOAA's National Marine Aquaculture policies issued in June 2011, encourage and foster development of sustainable marine aquaculture in the context of NOAA's multiple stewardship missions, and social and economic goals. Also in June 2011, NOAA issued a National Shellfish

Initiative to further the goal of increasing populations of bivalve shellfish in our nation's coastal waters through sustainable commercial production and native shellfish restoration activities. NOAA recognizes the broad suite of economic, social, and environmental benefits provided by shellfish, including jobs and business opportunities; meeting the growing demand for seafood; habitat for important commercial, recreational, and endangered and threatened species; species recovery; cleaner water and nutrient removal; and shoreline protection. Within NOAA's National Ocean Service (NOS), the Coastal Aquaculture Planning and Environmental Sustainability (CAPES) program works to support coastal planning for marine aquaculture including operating, monitoring, and assessing aquaculture impacts in coastal environments.

This letter represents input from the CCO, the California Regional Aquaculture Coordinator, and NOS-CAPES. In the Regulatory Authorities section, NMFS provides information on biological resources, *i.e.*, species and habitats, under our stewardship that may be affected by the Project. NMFS comments and recommendations are organized into two sections: Project Description, and Potential Environmental Effects to Biological Resources. Key comments and recommendations pertain to: 1) information needed to better understand the Project implementation; 2) conclusions regarding effects to eelgrass; 3) conclusions pertaining to potential shellfish aquaculture effects to the phytoplankton availability to the food web; and 4) conclusions pertaining to potential effects to ESA-listed fish species from introduction of intertidal structure.

NMFS REGULATORY AUTHORITIES

Endangered Species Act. During the Corps consultation with NMFS, we will consider potential effects of the project on the following threatened species listed under the ESA: (1) Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) Evolutionarily Significant Unit (ESU), listed on June 28, 2005 (70 FR 37160); (2) California Coastal (CC) Chinook salmon (*O. tshawytscha*) ESU, listed on June 28, 2005 (70 FR 37160); (3) Northern California (NC) steelhead (*O. mykiss*) Distinct Population Segment (DPS), listed on January 5, 2006 (71 FR 834); and (4) Southern DPS of North American green sturgeon (*Acipenser medirostris*), listed on April 7, 2009 (71 FR 17757); and critical habitat for SONCC coho salmon (64 FR 24049, May 5, 1999); CC Chinook salmon (70 FR 52488, September 2, 2005); NC steelhead (70 FR 52488, September 2, 2005); and Southern DPS of North American green sturgeon (74 FR 52300, October 9, 2009). NMFS 1

The essential habitat features of SONCC coho salmon critical habitat in the action area include adequate: substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions. Humboldt Bay serves as a migratory corridor, as well as foraging habitat for outmigrating SONCC coho salmon smolts, prior to ocean entry. The NMFS (2014) SONCC coho salmon recovery plan is an additional source of information on the status of the Humboldt Bay Tributaries population, and its role in recovery of this ESU.

For CC Chinook salmon and NC steelhead, the essential primary constituent elements (PCE) of critical habitat support rearing and migratory corridor functions, are namely areas free of obstruction with water quality, water quantity and salinity conditions supporting juvenile and

adult physiological transitions between fresh-and saltwater; and aquatic vegetation which supports juvenile and adult foraging, including aquatic invertebrates and fishes, supporting growth and maturation. The PCEs in the action area support a timely ocean entry of juvenile CC Chinook salmon and NC steelhead, through the rearing and migratory corridor functions.

The estuarine PCEs of southern DPS green sturgeon critical habitat in Humboldt Bay that are essential to the conservation of this species include: food resources; water flow; water quality; water depth; sediment quality; and migratory corridors to support feeding, migration, and aggregation and holding by green sturgeon adults and subadults. The invertebrate prey resources for green sturgeon in Arcata Bay are primarily found in the intertidal mudflats and subtidal channel margins, and include epibenthic and benthic invertebrates, Dungeness crab, and a variety of clams. The deep water channels in Humboldt Bay serve as a migratory corridor connecting the rearing and holding habitat in Arcata Bay with the Pacific Ocean.

Magnuson-Stevens Fishery Conservation and Management Act. NMFS will consider the potential adverse effects of the project on the quality and quantity of Essential Fish Habitat (EFH) for species managed under the Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagics Fishery Management Plans, pursuant to the MSA. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." *Waters* include aquatic areas and their associated physical, chemical and biological properties. *Substrate* includes sediment underlying the waters. *Necessary* means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. *Spawning, breeding, feeding, or growth to maturity* covers all habitat types utilized by a species throughout its life cycle. Habitat Areas of Particular Concern (HAPC) are discrete subsets of EFH that provide important ecological functions or are especially vulnerable to degradation. Seagrass, including eelgrass (*Zostera marina*), is identified as a HAPC for Pacific Groundfish and Pacific Salmon. In 2014, NMFS WCR issued the California Eelgrass Mitigation Policy and Implementing Guidelines (CEMP). Pursuant to CEMP and under EFH consultation authorities, NMFS recommends the proposed Project result in no net loss of eelgrass habitat function. NMFS 1

Marine Mammal Protection Act. Under the MMPA, NMFS is charged with protecting whales, dolphins, porpoises, seals, and sea lions. Under section 118 of the MMPA, NMFS is required to categorize all U.S. Commercial Fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals occurring in each fishery, and publish a List of Fisheries (LOF) each year. Shellfish aquaculture is considered a Category III fishery, and operators are not required to register with NMFS or obtain a marine mammal authorization (79 FR 14418, March 14, 2014). However, any operator participating in a fishery listed on the LOF must report to NMFS all incidental injuries and mortalities of marine mammals that occur during commercial fishing operations, regardless of the category. In addition, projects that include activities that may result in the "take" of marine mammals (*e.g.*, harassment or injury from sound produced during in-water pile driving) may require an Incidental Harassment Authorization (IHA) or Letter of Authorization (LOA) issued by NMFS.

PROJECT DESCRIPTION

The DEIR states that the Project is designed for some flexibility in culture methods, however general shellfish culture methods, based on methods already employed in Humboldt Bay, are NMFS 2

described. The description of the shellfish infrastructure and its likely location of deployment, as well as the operations associated with infrastructure maintenance and shellfish harvest, establishes the spatial and temporal framework for the analysis of potential effects to the physical and biological components of the aquatic habitat. To improve the Project description for a robust effects analysis, the DEIR could describe: NMFS 2 Cont.

1. Size and location of the 26 proposed lease parcels and duration of the leases. | NMFS 3
2. Maximum number of racks, longlines (cultch and basket) likely to be planted per acre. | NMFS 4
3. Removable mooring points or anchors for subtidal macroalgae longline culture | NMFS 5
4. Any shading minimization measures incorporated in subtidal culture methods, *e.g.*, grated floating walkways. | NMFS 6
5. Benthic foot print of the thirty-two 18-in piles | NMFS 7
6. Additional information pertaining to pile installation (*e.g.*, seasonal timing, number of piles per day, feasibility of vibratory hammer, installation, anticipated noise levels with minimization measures) | NMFS 8
7. Whether aquaculture the in new intertidal lease areas will unequivocally avoid eelgrass habitat, or if placement will be outside of eelgrass to the extent practicable (*e.g.*, one-meter buffer described in Mitigation BIO-4). | NMFS 9

In order to understand the specific thresholds for the surface water, water column, benthic footprint, biomass per acre, the DEIR could include:

1. The dry weight biomass per line, per rack (p. 22). | NMFS 10
2. Calculations for the water surface area, water column volume, benthic foot print for each culture type, (*e.g.*, unit volume and number of units per acre; number of lines and stakes per acre) in sections 2.5.2 through 2.5.5.2. | NMFS 11
3. Reason for selecting the values of culture characteristic thresholds in Table 5. A column showing the number of racks and lines would also be helpful. | NMFS 12

To support the pre-permitting approach to aquaculture expansion into intertidal areas that currently lack artificial structure, consider adding the following assurances to the HBHRCD Project oversight:

1. Because the lessee will decide the type of shellfish culture methods to employ, provide the opportunity for the resource agency personnel to participate in the lease site visits during and immediately after planting during the first few years of implementation. This would allow for proactive guidance. | NMFS 13
2. When a lessee proposes a new culture method or an adaptation of the general culture methods, contact the resource agencies and solicit comments. | NMFS 14
3. Provide copies of the annual reports to state and federal permitting and resource agencies. | NMFS 15
4. Consider inclusion of eelgrass monitoring to detect potential effects from deployment of new aquaculture structures, vessels or trampling. | NMFS 16

POTENTIAL ENVIRONMENTAL EFFECTS TO BIOLOGICAL RESOURCES

NMFS provides the following comments regarding the potential effects of the Project on biological resources under our stewardship. In addition, NOS-CAPES provided technical review | NMFS 17

and comment on the Humboldt Bay Carrying Capacity Analysis (CCA, and their review and comments are enclosed. The DEIR should identify effects, and provide a thorough analysis to determine the significance of those effects. NMFS 17

Clarify Conclusions regarding Effects to Eelgrass. Potential effects to eelgrass should be identified, regardless of its classification as either continuous or patchy, which is a naming convention of the Coastal and Marine Ecological Classification System (CMECS) used for mapping the habitats in Humboldt Bay (Schlosser and Eicher 2012). Under CMECS, eelgrass bed classification is a function of both continuity and percent cover, *i.e.*, patchy eelgrass cover ranges from >10% and <85% whereas continuous eelgrass is ≥85 percent cover. At the Intertidal Sites 1 and 2, eelgrass occupies approximately 72 and 80 percent of the habitat, respectively (Table 10). Consider describing the potential effects to eelgrass by location and in more detail, specifically as follows. NMFS 18

1. Be consistent and clear as to whether impacts to eelgrass are anticipated to be avoided or minimized.
2. If the impacts to eelgrass are minimized but not avoided, describe the magnitude and intensity of impact (*i.e.*, areal extent, density) that is anticipated and how that impact will be mitigated. For example, the DEIR (p. 49) states that a portion of the intertidal aquaculture lease overlaps with 48 acres mapped as continuous eelgrass; and (p.60) states that the Project will result in some minor decrease in density and/or distribution of eelgrass.
3. Evaluate potential effects of new intertidal structure on the patches of eelgrass in depressions commonly referred to as "leopard skin", which are formed under unique tidal energy conditions (Fredericksen *et al.* 2004, Schlosser and Eicher 2012).
4. Confirm the requirement for at 1-m buffer to avoid impacts to patchy and continuous eelgrass habitat, and explain the departure from the 5-ft buffer recommended in the CEMP.

Clarify Utility and Interpretation of Sustainability Indicators to describe Food Web Effects (CCA). Because zooplankton feed on phytoplankton, shellfish culture suspended in the water-column performs an ecological role similar to zooplankton (Gibbs 2007). NMFS suggests the use of Gibbs (2007) sustainability indicators to evaluate the ecological effects of aquaculture in Humboldt Bay would be strengthened if the CCA describes: 1) how the Gibbs (2007) method has been used elsewhere to date, as well as whether this approach has been demonstrated to be a credible, field-validated method, with some performance record; 2) why use of indicators for subtidal aquaculture is appropriate for intertidal aquaculture; and 3) why only three of the four indicators were calculated, and why Gibbs (2007) depletion footprint was not calculated. NMFS 19

Biomass Calculation. Based on the biomass values in Tables 5 and 7, the total biomass for the Project is approximately 133.27 metric tons and appears to use the stocking rate for rack and bag. Because this value is greater than 87.44 metric tons in table 3 of Appendix C, the indicator values may be inaccurate. NMFS 20

Clearance efficiency. Since the majority of the proposed shellfish culture is located in intertidal habitat, consider expanding the carrying capacity analysis that evaluates a scenario using the NMFS 21

daily tidal prism volume of Arcata Bay in determination of the clearance efficiency performance indicator. Because the oysters do not have opportunity to filter the entire volume of Arcata Bay in a day, the clearance efficiencies in the CCA may be inaccurate, and an underestimate. The basis for the three-day residence time (Bricker *et al.*2007) is unknown. NMFS 21 NMFS 22

Filtration pressure. Gibbs (2007) suggests knowledge of biomass production on the farms can be used to estimate the total carbon extracted from the water column by shellfish culture every year. In the example of filtration pressure performance indicator for Beatrix Bay, Gibbs (2007) mentions that the bivalves require five times their biomass in carbon (assuming a 20% efficiency of conversion from phytoplankton to oyster tissue). As written, the filtration pressure in the CCA does not appear to consider this factor, and may be inaccurate. Consider including the conversion efficiency factor in the CCA. NMFS 23

Regulation ratio. Since phytoplankton production varies by season, the regulation ratio does not account for periods of low primary production. Consider calculating the ratio for different scenarios of productivity, similar to the different bay water residence times. NMFS 24

Interpretation of Results. The CCA employed Gibbs (2007) indicators, yet rationalized that values greater than 0.05 are not a concern. The fact that several of the indicators exceed 0.05 does not seem to support the conclusion that the food resources for wild species would not be significantly affected. NMFS recommends a more in-depth discussion of the attributes of the performance sustainability indicators; the risk associated with the uncertainty of the sustainability indicators (assumptions in indicator calculations); and how this uncertainty may this affect the reliability of interpretation of the values. NMFS 25

Potential CCA Improvements. Field testing of the Gibbs (2007) model in Arcata Bay might allay concern about risk and uncertainty regarding ecological carrying capacity versus production carrying capacity. There are modeling platforms with good performance records. See NOS/CAPES Technical Review for suggestions and options that would strengthen the CCA and provide a robust platform that allows for temporal and spatial simulations. For clarity, the CCA should present the variables, and their conversion to common metrics, used in calculations of the sustainability indicators as a separate conversion factor table, *e.g.*, Barnhart *et al.* (1992). NMFS 26

Expand Discussion of Effects of Intertidal Structures on Fish Behavior. NMFS recommends a thorough discussion of the potential effects of the placement of new in-water structures in intertidal habitat on unimpeded passage and rearing function of the designated critical habitat during flooding and ebbing tides. For each location, include the percentage of the water column that will be occupied by structure at high and low tide, along with a discussion of the potential effect of change of the water column habitat from open water without artificial structure to a water column occupied by aquaculture structure on rearing migratory corridor habitat functions. Present the potential effects of presence of proposed structure on the bottom and in the water column, specifically the spacing of the PVC stakes, associated spacing of lines and cultch/baskets, on the ability of green sturgeon subadults and adults to access substrate and associated epibenthic and infaunal benthic prey in the intertidal areas within the Project footprint. For example, the time and distance required for an individual green sturgeon to access unimpeded benthic habitat may reduce the amount of time available for intertidal foraging. If the foraging success is significantly reduced, the growth of an individual may be affected. In addition, the reasoning in the DEIR suggesting that green sturgeon entanglement in intertidal NMFS 27

aquaculture is unlikely should be reconciled with the potential effects of avoidance of the planted areas.

Identify any potential changes in juvenile salmonids access to the intertidal habitat at high tide resulting from the presence of intertidal aquaculture infrastructure. Because Caspian terns nest on Sand Island from April through August (NMFS 2005); and brown pelicans roost year-round on clam rafts immediately to the east of the Samoa Bridge in Arcata Bay, juvenile salmonids accessing the shallower, intertidal areas may be less vulnerable to avian predation. NMFS 27

Other Effects to Consider

Expand Spatial Scale of Effects Analysis. Since an individual animal encounters the intertidal habitat in their environment as a continuum at a scale commensurate with its body size and swimming ability, the likelihood of an individual encountering intertidal aquaculture is related to behavior, habitat use, and the number of structures potentially exposed to in any given tidal cycle. NMFS recommends that potential effects intertidal aquaculture on intertidal benthic and water column habitat be evaluated at several spatial scales (*e.g.*, individual array of lines or racks, acre, lease, intertidal site, region of Arcata Bay, Humboldt Bay). The DEIR presents culture characteristic thresholds on the scale of an acre (Table 5); and the effects analysis should also consider localized effects as well as effects at a larger scale (*e.g.*, Arcata Bay).

Expand Discussion of Effects to Physical Processes. Effects of the shellfish culture structures on physical processes in the water and substrate, *e.g.*, water flow, turbulence, sediment transport, and accumulation of organic matter have been documented (Grant and Bacher 2001, Haven and Morales-Alamo 1966, Newfields 2009, Nightingale and Simenstad 2001). Although the DEIR states that oyster culture has a localized effect on sediment distribution and tidal circulation, including a 95 mm elevation increase from sediment accumulation, an analysis of the effects of this change is absent. Because the non-native dwarf eelgrass (*Zostera japonica*) has been identified in the vicinity of Intertidal Sites 3 and 4 (Schlosser and Eicher 2007) and this species tends to grow at higher elevations, the DEIR should describe the potential effects on intertidal aquaculture at thes locations on potential spread of dwarf eelgrass. In addition, the DEIR should include an analysis of the effects of changes to tidal water flow in the water column and to the substrate following introduction of the subtidal or intertidal structures. NMFS 28

Provide Additional Information on Effects to Benthic Fauna. The DEIR (p.63) states shellfish culture will affect benthic habitat. Although Hosack *et al.* (2006) compared benthic invertebrates among eelgrass, bottom oyster culture, and mudflat habitats; the Project does not include bottom culture. In addition, to the displacement of benthic epifauna and infauna during installation of the PVC stakes or the racks, consider discussing the potential effects of the placement of the artificial structures on benthic prey availability. For example, if epibenthic and benthic infauna are less accessible, the artificial structure may provide a predation refuge. NMFS 29

Expand Discussion of Potential Reduction in Prey Species. Pacific herring, an important prey species for listed salmonid juveniles and adults, are known to spawn on eelgrass in Arcata Bay (Mello and Ramsay 2004). Present a discussion of potential effects of aquaculture operations at the proposed intertidal sites that overlap with known Pacific herring spawning sites. Specifically, the survival of eggs attached to the infrastructure in known spawning beds NMFS 30

compared to eggs deposited on eelgrass should be discussed. Although disturbance to spawning adults and newly spawned eggs may be reduced by avoiding these areas, include a discussion of the potential effects to survival of eggs spawned on the infrastructure compared to those spawned on eelgrass (e.g., increased desiccation due to exposure to air and wind, increased predation). An additional map, showing the location of the Pacific herring spawning areas relative to the proposed Project intertidal operations would be helpful in this effects analysis. NMFS 30 Cont.

Effects to Marine Mammals. The DEIR should identify the source of the marine mammal procedures (p.55), as well as identify the harbor seal pupping and haul-out locations. Lowry *et al.* (2005) documented the location and number of harbor observed in Arcata Bay in July, 2004, and would be a recommended reference to inform this description. Consider identifying the behavioral disruption sound threshold for marine mammals when using vibratory hammers (120 dB) for pile installation. The HBHRCD should contact Monica DeAngelis of NMFS (monica.deangelis@noaa.gov) for any additional seasonal recommendations to minimize disturbance of harbor seal females and pups, as well as minimization of effects of pile driving. NMFS 31

The proposed Project has the potential to be responsive to NOAA Aquaculture policy and initiative goals and may further NOAA's efforts maintaining and protecting healthy and productive marine ecosystems, while balancing competing uses of the marine environment. NMFS appreciates the opportunity to provide input on the potential environmental effects of the proposed Project. Please contact Ms. Diane Ashton at (707) 825-5185, or via e-mail at diane.ashton@noaa.gov, if you have any questions concerning technical comments. NMFS 32

Sincerely,

for Irma Lagomarsino
Assistant Regional Administrator
California Coastal Area Office

Enclosure

Literature Cited

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CAPES Program
National Ocean Service

CAPES Technical Review

H.T. Harvey and Associates Humbolt Bay Carrying Capacity Analysis, December 2014

CAPES Lead Reviewer: Dr. Kenneth Riley
Submitted to Dianne Windham, January 20, 2015

The NOAA NOS Coastal Aquaculture Planning and Environmental Sustainability Program (CAPES) conducted an independent peer review of the Humboldt Bay Carrying Capacity Analysis to examine the scientific and technical information and scholarly analysis presented in the document and assessed whether: (1) appropriate scientific information was used; (2) reasonable conclusions were drawn from the information; and (3) significant information was omitted from consideration. The Humboldt Bay Carrying Capacity Analysis was completed by an environmental consulting firm, H.T. Harvey & Associates (HTHA), to supplement the Environmental Impact Report and aid in decision-making by coastal managers with regulatory responsibilities. The Humboldt Bay Carrying Capacity Analysis presents research that is important to the Humboldt Bay Mariculture Pre-Permitting Project, an economic development initiative to expand commercial mariculture activities in Humboldt Bay to create job and support the local economy. Through this project, the Humboldt Bay Harbor, Recreation and Conservation District (Humboldt Harbor District) is requesting regulatory approval to grant intertidal and subtidal leases for development of commercial shellfish aquaculture operations.

CAPES 1

The development of shellfish carrying capacity models has been thoroughly reviewed in the scientific literature and their application in coastal planning, regulation and permitting, and ecosystem-based management is increasing (see: Byron and Costa-Pierce 2013 McKindsey et al. 2006). Models and tools for assessing the carrying capacity of an estuary have advanced significantly over the past decade, especially with higher order models required for forecasting production, ecological, and social carrying capacity. While most environmental models rely on technically complex mathematical algorithms, the impacts of shellfish aquaculture on the environment is well documented and published models are supported with empirical field monitoring validation studies that include pelagic and benthic aquaculture deployments in intertidal and subtidal locations.

Contrary to the position of HTHA presented in the Carrying Capacity Analysis, some environmental models for assessment of carrying capacity have a very successful record for simulating shellfish production and ecological carrying capacity. The HTHA statement "many argue (models) do not have a particularly good performance record" is quite outdated. For example, Ferreira et al. (2009) evaluated application of the Farm Aquaculture Resource Management (FARM) model in analysis of shellfish production in farms rearing major species of oysters and clams cultivated in Europe and the U.S. FARM model results for production and ecological impacts were highly correlated with reported production values and environmental monitoring over a latitudinal range of twenty degrees. Unfortunately, many coastal decision-makers believe modeling requires large, expensive datasets and high computational power to be

CAPES 2

implemented. While this is certainly not the case, it has given rise to the development of simpler tools to address environmental concerns with shellfish farms.

In the Carrying Capacity Analysis for Humboldt Bay, HTHA uses a set of sustainability performance indicators (rather than more sophisticated modeling approaches which allow simulations across temporal and spatial scales) developed by Gibbs (2007) for assessing the environmental impact of shellfish farms. The procedure integrates many of the same parameters in the classic Dame index for estimating carrying capacity of bivalves in coastal ecosystems (Dame and Prins 1998). The Gibbs Performance Indicators are derived from estimates of watermass residence time, primary production time, and bivalve clearance rates. While certainly not as sophisticated as more elaborate numerical models, the Gibbs Performance Indicators should be viewed as an intermediate tool to address some environmental concerns. Our principal concern with use of the Gibbs Performance Indicators is that the method significantly lacks published field validation studies and sensitivity analysis. CAPES 2

Specific comments and concerns on the Carrying Capacity Analysis are presented below:

1. The metrics for Inlet Volume and Tidal Exchange are well reviewed and presented. The authors acknowledge the range of uncertainty in residence time, and we agree with the authors using a range of residence times to estimate best-case and worst-case scenarios. Further, this approach could add a seasonal or temporal aspect to the Gibbs procedure, which it currently lacks. CAPES 3

2. The Gibbs work was originally based on suspended shellfish culture practices; however, quite a variety of culture practices (i.e., bottom culture) are included in the Pre-Permitting Project. The HTHA report should address whether there are any deviations from culture practices presented in Gibbs' original work. CAPES 4

3. The HTHA is based on an average clearance rate for several mollusk species. Why not use clearance rates specific for the Pacific oyster *Crassostrea gigas* as provided by Ren et al. (2000)? This could improve the filtration calculations. CAPES 5

4. HTHA uses a mean clearance rate estimate for oysters (2.54 L/g/h) derived from Cranford et al. (2011). While this estimate is the result of a thorough review and meta-analysis, Kumamoto oysters (*Crassostrea sikamea*) and Manila clams (*Tapes philippinarum*) were not included in the analysis by Cranford et al. (2011). Clearance rates are published for Kumamoto oysters and Manila clams. HTHA should complete their own meta-analysis for the Humboldt Bay shellfish species using the methods of Cranford et al. (2011). Alternatively, HTHA could use published clearance rates specific for Pacific oysters, Kumamoto oysters, and Manila clams. It would seem that using species-specific clearance rates would be a best practice, especially with domesticated strains.

5. Suspension feeding always results in local depletion. The ecological costs of seston depletion by bivalve aquaculture are of concern only when the area impacted is persistent and ecologically significant in both magnitude and scale. Cranford et al. (2011) reports clearance rates for oysters on a seston-based diet as 4.78±0.28 L/g/h as compared to algae-based diet of 2.15±0.25 L/g/h. For the purpose of measuring impact on food and detrital resources in Humboldt Bay, perhaps calculations should be completed using the seston-based diet. The use of lower

values will cause underestimation when extrapolating mean individual rates to the population level. CAPES 5

6. The Cranford review lacked studies using domesticated or polyploid shellfish which are commonly used in commercial shellfish aquaculture operations. Organisms of this nature might have different gill area-to-dry tissue mass ratios considerably impacting results. CAPES 6

7. The opportunity for Manila clam culture in Humboldt Bay should be discussed as it relates to overall production and environmental impact. Clams can significantly contribute to bivalve filter feeding in estuarine food webs also. CAPES 7

8. Methods for describing how average chlorophyll concentration was determined for incoming tides should be provided with a measure of annual or seasonal variance. CAPES 8

9. Methods used to estimate phytoplankton biomass are appropriate and phytoplankton production estimates are similar to other estuarine systems. CAPES 9

10. We agree that dry weight is the most accurate way to calculate the total biomass of shellfish in production given that modern culture techniques can significantly affect shell morphology.

11. We are concerned that the clearance efficiency is exceeding the flushing rate. According to Gibbs (2007), in such cases bivalves could be expected to regulate phytoplankton abundance as the water would be filtered by shellfish repeatedly before it is exchanged through the inlet. High clearance rates raise concern for food resources and increased competitive pressures within natural shellfish beds. More sophisticated modeling approaches could provide insight and predictive capabilities related to these concerns. CAPES 10

12. Despite Cranford et al. (2011) review and this research effort by HTHA, there remains uncertainty in the measurement of clearance rate, which affects our confidence in predictions of individual to community-level feeding rates and ultimately food resources in Humboldt Bay. The revision of clearance efficiency calculations and use of higher clearance rates for oysters and clams might cause some alarm and suggest that shellfish aquaculture could control phytoplankton dynamics. CAPES 11

13. We are quite pleased that estimates for filtration pressure indicate that expansion of shellfish aquaculture industry in Humboldt Bay is far below the theoretical carrying capacity. The low values obtained suggest that very little of the carbon resources generated by natural and cultured shellfish are passing through shellfish aquaculture operations. This finding ultimately suggests that aquaculture activities are having minimal impact on the ecosystem. CAPES 12

14. The regulation ratio values are well below the 0.05 threshold and suggest that phytoplankton turns over quickly and shellfish have a negligible role in phytoplankton or seston dynamics.

Water quality protection and improvement remains the key basis on which the shellfish industry can develop sustainably and with confidence. The results from this study suggest that CAPES 13

substantial expansion of shellfish aquaculture operations in Humboldt Bay has the potential to impact the ecological processes in the region. Using the Gibbs (2007) method, findings suggest that expansion of the aquaculture industry will not exceed the ecological carrying capacity or significantly impact food resources in Humboldt Bay. Statistical estimates of carrying capacity are a useful first approach, but we recommend that the Humboldt Harbor District consider use of a dynamic modelling platform which takes into account complex feedbacks and provides a more realistic estimate of carrying capacity, accounting for resource partitioning with wild species.

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PACIFIC FLYWAY COUNCIL

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March 12, 2015

Mr. Jack Crider
Executive Director
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030
Eureka, CA 95502-1030
jcrider@humboldtbay.org

Subject: Draft EIR for the Humboldt Bay Mariculture Pre-Permitting Project (SCH#2013062068)

Dear Mr. Crider:

The Pacific Flyway Council (Council) wishes to express its concerns regarding your agency's Project and DEIR. The Council feels the Project will have significant impacts to eelgrass and species dependent upon eelgrass, specifically black brant. PFC 1

The Council is an organization of the fish and wildlife agencies of the 11 western states, British Columbia, Alberta, and cooperators in Mexico. The Council facilitates the scientific management of migratory birds and their habitats, in association with federal agencies and other cooperators, to sustain and enhance the public's resource interest in the U.S., Canada, and Mexico. Our Council has gone on record opposing projects in critical brant habitats in the past such as Teshekpuk Lake in the Northeast National Petroleum Reserve, Alaska (1998, 2004, 2005, 2006, and 2007) that serves as a molting site for 50,000 – 90,000 black brant. PFC 2

There are several key reasons why Humboldt Bay is of exceptional importance to black brant and Project risks are significant:

- Black brant almost exclusively rely on eelgrass during winter and spring;
- Black brant occur in Humboldt Bay as spring and fall migrant and winter visitors;
- Humboldt Bay is the most utilized bay in CA by black brant (directly related to the abundance of eelgrass); PFC 3
- The population of black brant is below the objective of 5,000 set for Humboldt Bay in the Pacific Flyway Brant Management Plan (see http://www.pacificflyway.gov/Documents/Pb_plan.pdf).
- Reliance on a single food source make black brant more vulnerable to fluctuations in quality and quantity of eelgrass;
- Aquaculture impacts to eelgrass have been documented;

- Brant avoid using eelgrass beds near artificial structures in intertidal areas (e.g. aquaculture facilities in Gray Harbor, Washington). PFC 4
- Increased boat traffic from aquaculture will reduce black brant using Humboldt Bay (increased energy demands and reducing food availability); PFC 5
- The Project affects a total of 527 acres of intertidal eelgrass and mudflat areas, and 21 acres of subtidal eelgrass and mudflat area; including 67% (353.8 acres) of eelgrass habitat; PFC 6
- Eelgrass populations are in decline, particularly in historically important California bays (Morro Bay);

Given the established importance of Humboldt Bay to black brant the Council recommends the Project footprint be reduced and adequate mitigation measures be implemented in order to reduce disturbance to black brant and eelgrass in Humboldt Bay. The DEIR should specifically recognize the broad interests of stakeholders from other states, British Columbia, Alberta, and cooperators in Mexico in the migratory bird resources of Humboldt Bay, and assess the potential impacts of aquaculture leases on those interests. PFC 7

The Council appreciates the opportunity to provide comments regarding the DEIR. The Council will maintain a strong interest in your process and choice of preferred actions.

Sincerely,

Tony Wasley

Tony Wasley, Chair
Pacific Flyway Council

Cc: Pacific Flyway Council

cc/enclosure: AR150308WCR2015AR00067.

March 12, 2014

Mr. Jack Crider
Executive Director
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030
Eureka, CA 95502-1030

Dear Director Crider and Commissioners:

On behalf of our members, we submit the following comments on the Draft Environmental Impact Report (DEIR) for the Humboldt Bay Mariculture Pre-Permitting Project. While we recognize that shellfish aquaculture, when properly sited and scaled, can be carried out sustainably, this Project would have significant, adverse effect on numerous habitats and species in Humboldt Bay. Furthermore, the Project is only one of two large projects currently undergoing California Environmental Quality Act (CEQA) review that would together expand the existing, substantial footprint of aquaculture in the North Bay from approximately 400 acres to approximately 1549 acres. The District's proposed project would occupy an additional 527 acres while the project proposed by Coast Seafoods[1] would occupy 622 acres, representing an approximate four-fold increase in sensitive intertidal areas converted to mariculture use (Figure 2). AUD 1

The DEIR fails in numerous ways to analyze and offer adequate mitigation for the significant individual and cumulative impacts that this Project would have on the environment, including sensitive species, habitats, and species protected under the federal and state Endangered Species Acts (ESA). Mitigation measures would fall far short of protecting these resources, and the DEIR AUD 2

[1] Initial Study: Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. 2015.

fails to describe cumulative impacts from both projects. As such, the DEIR fails to satisfy CEQA requirements. For these reasons, we strongly oppose this project as currently proposed. AUD 2

Given the sensitive nature of the habitats in Humboldt Bay and their critical importance to birds, fish, other wildlife, and recreational and fishing communities, any substantial expansion of mariculture operations would have significant, unavoidable impacts to the environment and associated uses. The importance of these resources underscores the need for a thorough CEQA review and also for careful planning for their future use and conservation. We therefore urge the Harbor District to adopt a marine spatial planning framework to manage continued aquaculture operations in Humboldt Bay, as well as any proposed expansion of such operations. That framework should set forth clear criteria for all existing and proposed aquaculture operations, including conservation and restoration of fish, wildlife and ecosystem services provided to the people of California by the natural resources of Humboldt Bay. The framework should also identify and evaluate sensitive habitat areas and species that use the Bay, their conservation needs and vulnerabilities, and promote further research on the effects of aquaculture on these species and habitats (the need for which is called out numerous times in the DEIR itself). The criteria should be developed and applied by the lead, responsible and trustee agencies and include full public input. Such a process should ensure that plans for continued aquaculture and any proposed expansions in Humboldt Bay are detailed and transparent, and individual and cumulative impacts are evaluated in the context of their overall significance, including longer term climate change effects. Such an approach would be consistent with the framework already set forth in the Humboldt Bay Management Plan.[2] AUD 3

In addition, we support the California Coastal Commission's suggestion, that the Harbor District convene a Joint Review Panel of responsible agencies to review both the Coast Seafoods and Harbor District proposed projects.[3] These projects are large, controversial, and complex; they require multiple state and federal permits and associated environmental review processes. Some agencies have already identified numerous insufficiencies in the projects' current CEQA documents. With respect to the Harbor District DEIR, we agree that it is wholly insufficient to support going forward with this project. These deficiencies are explained below. AUD 4

Legal Background: California Environmental Quality Act

CEQA is intended to provide for the protection and enhancement of the state's environment and to "ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions."[4] CEQA accomplishes these goals in part by ensuring that proposed projects are authorized only after their environmental impacts are thoroughly analyzed in an EIR, the AUD 5

[2] Humboldt Bay Harbor, Recreation, and Conservation District, Humboldt Bay Management Plan (May 2007).
[3] California Coastal Commission. 2015. Letter to Humboldt Bay Harbor, Recreation and Conservation District on the Initial Study: Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. February.
[4] Pub. Res. C. § 21001(a)-(d).

public has full opportunity to inform that analysis, and necessary mitigation measures have been adopted.

A. Analysis of Significant Impacts

CEQA requires that an "EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated and discussed and it must permit the significant effects to be considered in the full environmental context."[5] CEQA defines "significant effect on the environment" as "a substantial, or potentially substantial, adverse change in the environment."[6] In addition, an EIR "must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published…or…at the time the environmental analysis is commenced, from both a local and regional perspective."[7]

AUD 5 (Cont)

Notably, CEQA requires analysis of effects on "ecosystems," the boundaries of which are not defined by state lines.[8] Therefore, the EIR must analyze environmental effects occurring both within California and outside of it. Indeed, as CEQA is "to be interpreted in such manner as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language" the Project's impacts must be analyzed in terms not only of their effects around Humboldt Bay, but throughout the Pacific Flyway and California Current Large Marine Ecosystem.[9] This is particularly important for this project given that many of the species it affects are highly migratory and commercially important.

The EIR's conclusions regarding the project impacts must be based on a full analysis of relevant factors and the best available information. A conclusion regarding the significance of an environmental impact that is not based on an analysis of the relevant facts fails to fulfill CEQA's informational goal.[10] Furthermore, CEQA requires an agency to "use its best efforts to find out and disclose all that it reasonably can."[11]

As detailed below, the DEIR's analysis of significant impacts is grossly inadequate in that it relies on unsubstantiated conclusions and uncertain, insufficient mitigation measures, lacks scientific basis, and conflicts with local, state, and federal policies and laws related to resource protection.

AUD 6

[5] CEQA Guidelines, § 15125(c), (emphasis added).
[6] Pub. Res. C. § 21068.
[7] CEQA Guideline § 15125(a)
[8] CEQA Guidelines § 15358(a)(2).
[9] *Laurel Height Improvement Ass'n v. Regents of University of California*, 47 Cal.3d 376, 404 (1988).
[10] *Stanislaus Natural Heritage Project*, 48 Cal.App.4th at 182; *Citizens of Goleta Valley v. Board of Supervisors of Cty of Santa Barbara*, (Cal. 1990) 52 Cal.3d 553, 568.
[11] Guidelines § 15144; *see also* Guidelines § 15151 (an EIR must disclose what is "reasonably feasible").

B. Analysis of Cumulative Impacts

CEQA requires that an EIR address cumulative impacts "when the project's incremental effect is cumulatively considerable."[12] The EIR must therefore identify all existing and likely future projects that contribute to the same cumulative impacts as the proposed project. Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts."[13]

The cumulative impact analysis must address the severity of the impacts and their likelihood of occurring. An adequate discussion of significant cumulative impacts must include, among other things, a "summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available . . . ."[14] In other words, in deciding whether to approve a project, decision makers need to know what the expected impacts will be on the ground as a result of all of the projects identified as contributing to cumulative impacts. AUD 7

C. Analysis of Alternatives

The analysis of alternatives to the proposed project lies at "[t]he core of an EIR."[15] In this analysis, the EIR must consider a reasonable range of alternatives that would avoid or substantially lessen this impact while feasibly attaining most of the Project's basic objectives.[16] A "reasonable range" of alternatives includes alternative locations for project as well as alternatives to the project.[17] In addition, the EIR must analyze a "no project" alternative.[18] If the EIR refuses to consider a reasonable range of alternatives or fails to support its analysis with substantial evidence, the purposes of CEQA are subverted and the EIR is legally inadequate.[19] If a feasible alternative exists that will meet the project's objectives while reducing or avoiding its significant environmental impacts, the project may not be approved.[20]

As explained below, the range of alternatives consider in the Harbor District DEIR does not meet CEQA's requirement to avoid or substantially lessen the project's impacts. Nor does the DEIR explain the rationale for selecting the alternatives that it does consider or offer substantial evidence that any of the alternatives other than the "No Project" alternative meet CEQA requirements. AUD 8

D. Mitigation Measures

[12] CEQA Guidelines § 15130; *see also* CEQA Guidelines § 15355.
[13] CEQA Guidelines § 15355.
[14] CEQA Guidelines, § 15130(b)(4).
[15] *Citizens of Goleta Valley*, 52 Cal. 3d at 564; *see also* Pub. Res. Code § 21002.1(a) ("The purpose of an environmental impact report is . . . . to identify alternatives to the project . . . .").
[16] *See* § 21100(b)(4); CEQA Guidelines § 15126.6(a).
[17] CEQA Guidelines, § 15126.6(a).
[18] CEQA Guidelines, § 15126.6(e).
[19] *San Joaquin Raptor*, 27 Cal. App. 4th at 735-38; *Kings County Farm Bureau*, 221 Cal. App. 3d at 736-37.
[20] Pub. Res. Code § 21002.

CEQA's core substantive component requires that any public agency, including the Harbor District, "*shall* mitigate or avoid the significant effects . . . of projects that it carries out or approves *whenever* it is feasible to do so."[21] CEQA requires agencies must adopt environmentally superior alternatives or feasible mitigation measures to substantially decrease or avoid otherwise significant adverse environmental impacts of the proposed project.[22] To enable that decision making process, the EIR must set forth mitigation measures that can be adopted at the findings stage of the planning process. Those measures should be capable of: (a) "[a]voiding the impact altogether by not taking a certain action or parts of an action"; (b) "[m]inimizing impacts by limiting the degree or magnitude of the action and its implementation"; (c) "[r]ectifying the impact by repairing, rehabilitating, or restoring the impacted environment"; or (d) "[r]educing or eliminating the impact over time by preservation and maintenance operations during the life of the action."[23] The EIR must also include evidence of each mitigation measure's efficacy.[24] AUD 9

In addition, agencies may review a project proponent's prior shortcomings in analyzing the adequacy of proposed mitigation measures. The Supreme Court has stated that "[b]ecause an EIR cannot be meaningfully considered in a vacuum devoid of reality, a project proponent's prior environmental record is properly a subject of close consideration in determining the sufficiency of the proponent's promises in an EIR."[25]

In addition to CEQA's mitigation requirements, the California Endangered Species Act (CESA) requires full mitigation of impacts to state-listed species.[26] In particular, any permit issued to authorize incidental take of such species by the project must provide mitigation for all impacts on the species resulting from project, meaning that mitigation must address habitat loss as well as direct take.

The mitigation measures proposed in the DEIR are unsupported by evidence or analysis, and do not begin to meet CEQA's requirement to avoid impacts in the first instance, and otherwise minimize, rectify, or eliminate the impacts over time. AUD 10

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As detailed below, we strongly disagree with many of the assertions and determinations made in the DEIR. The DEIR asserts that the project with mitigation incorporated would have less than significant impacts on special status species, riparian habitats and sensitive natural communities, wildlife corridors or nursery sites, and federally protected wetlands. It also asserts that the project AUD 11

[21] Pub. Res. Code § 21002.1(b) (emphasis added).
[22] Pub. Res. Code §§ 21002, 21081(a); CEQA Guidelines, §§ 15002(a)(3), 15021(a)(2), 15091(a)(1).
[23] CEQA Guidelines § 15370.
[24] *See Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal. App. 4th 99, 130.
[25] *Laurel Heights Improvement Assoc. of San Francisco v. Regents of the University of California*, 47 Cal.3d 376, 420 (Cal. 1988).
[26] Pub. Res. C. § 2081(b)-(c).

would not conflict with local policies and ordinances protecting biological resources, or with approved local, state or regional habitat conservation plans. These assertions are not consistent with the best available science or the laws and policies protecting the natural resources at issue. As described below, the DEIR falls far short of CEQA procedural and substantive requirements. The Project may not be permitted to move forward based on such patently inadequate analysis and mitigation. AUD 11

The DEIR Fails to Provide a Complete and Accurate Project Description

The DEIR's project description fails to specify which methods of aquaculture will be used at Sites 1-4 (Figures 2-10), even though different methods result in different types and degrees of impacts to the resources at issue. The DEIR admits that this omission renders it impossible to predict impacts on certain resources, such as the effect of disturbance on waterfowl. For example, the DEIR notes that "aquaculturists will routinely visit leased sites for installation, inspections, planting and harvesting, product grading, and other activities associated with aquaculture practices. The number of visitations to each site will depend on the types of aquaculture operations that are occurring" which can range from daily to monthly visits. As noted below, brant are highly susceptible to disturbance and other waterfowl and shorebirds are susceptible to disturbance. Notwithstanding that it offers no scientific basis for its conclusion, the DEIR simply dismisses disturbance to waterbirds as less than significant without mitigation. Both the DEIR's failure to fully describe the project and its failure to offer a reasoned basis for its conclusions violate CEQA. AUD 12

Without a complete and accurate project description, an agency and the public cannot be assured that all of a project's environmental impacts have been revealed and mitigated. "An accurate, stable and finite project description is the *sine qua non* of an informative and legally sufficient EIR."[27] A complete project description is indispensable because "[a] curtailed or distorted project description may stultify the objectives of the reporting process."[28] The DEIR's failure to provide a full and accurate project description impedes any accurate analysis of impacts and undercuts the validity of the entire document under CEQA.

The Project Would Have Significant Impacts on Eelgrass (*Zostera marina*) and Fails to Comply with Existing Local, State, and Federal Policies for Protection of Eelgrass

The Harbor District Project would expand aquaculture operations in 483 acres of intertidal habitats, with 48 acres in dense eelgrass (defined as >84% cover) and 306 acres in patchy eelgrass (defined as 10%-84% cover). For the following reasons, we strongly disagree with the DEIRs conclusion that with implementation of mitigation measures BIO 3-5 impacts to eelgrass will be less than significant. Aquaculture expansion into 48 acres of dense eelgrass is in itself a significant impact. The DEIR lacks detail on how avoidance of eelgrass by boats will be monitored or reviewed. In addition, the DEIR proposes a one-meter buffer (BIO-4) between AUD 13

[27] *County of Inyo v. City of Los Angeles* (1977) 71 Cal. App. 3d 185 192-93.
[28] *Id.* at 199; *see also San Joaquin Raptor/Wildlife Center v. Stanislaus County*, 27 Cal.App.4th 713, 730 (1994) ("An accurate project description is necessary for an intelligent evaluation of the potential environmental effects of a proposed activity.")

aquaculture gear placement and eelgrass. Expanding aquaculture into dense eelgrass with a one-meter buffer between eelgrass and aquaculture equipment does not comply with state and federal spacing requirements, which were carefully developed and promulgated to protect eelgrass.

Specifically, the California Code of Regulations California regulations prohibit cutting or disturbing eel grass,[29] and aquaculture leases produced by the Department of Fish and Wildlife (DFW) include explicit language in lease agreements that eelgrass "may not be cut or disturbed."[30] DFW further requires a 10-foot buffer between the eelgrass and the aquaculture gear.[31]

AUD 13

The Department's regulations for protecting eelgrass are underscored by the California Eelgrass Mitigation Policy (CEMP), developed and promulgated by the National Marine Fisheries Service (NMFS). The primary directive of the CEMP is to preserve existing eelgrass extent and function by avoiding development in eelgrass:

> It is NMFS' policy to recommend no net loss of eelgrass habitat function in California. For all of California, compensatory mitigation should be recommended for the loss of existing eelgrass habitat function, but only after avoidance and minimization of effects to eelgrass have been pursued to the maximum extent practicable.

The CEMP further notes that "while improvements in eelgrass management have occurred overall, the importance of eelgrass both ecologically and economically, coupled with ongoing human pressure and potentially increasing degradation and losses associated with climate change, highlight the need to protect, maintain, and where feasible, enhance eelgrass habitat."[32]

Notably, in order to accommodate fluctuations in eelgrass growth, the CEMP defines eelgrass habitat as "areas of vegetated eelgrass cover (any eelgrass within 1 m^2 quadrat and within 1 m of another shoot) bounded by a 5 m wide perimeter of unvegetated area." The DEIR ignores this definition of eelgrass habitat and, in doing so, significantly underestimates the area of eelgrass habitat affected by both the Harbor District and the Coast Seafoods projects.

In fact, the DEIR does not even comply with the Harbor District's own Humboldt Bay Management Plan. That Plan adopts the mitigation priority set forth in CEQA, which requires that project proponents first avoid impacts altogether, then proceed to minimize those impacts.[33]

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[29] 14 C.C.R. §30.10.
[30] DFW. 1985. Lease agreement between Cove Mussel Company and DFW. Sacramento, CA. Provided by K. Ramey, DFW.
[31] Ramey, K. CDFW. Pers. Comm. 2015.
[32] NOAA Fisheries. West Coast Region. 2014. California Eelgrass Mitigation Policy and Implementing Guidelines http://www.westcoast.fisheries.noaa.gov/publications/habitat/california_eelgrass_mitigation/Final%20CEMP%20October%202014/cemp_oct_2014_final.pdf
[33] Humboldt Bay Harbor, Recreation, and Conservation District, Humboldt Bay Management Plan (May 2007), p. 209.

Moreover, the Plan assumes a minimum 100-foot buffer between projects and aquatic habitat areas adjacent to them.[34]

Unfortunately, the Harbor District has not chosen to avoid impacts to eelgrass: the DEIR proposes to expand aquaculture into 48 acres of dense eelgrass and fails to account for the 5 meter perimeter of unvegetated areas around all areas covered by eelgrass. The small buffers the DEIR does propose are wholly inadequate to prevent degradation of eelgrass habitat.[35]

Finally, much of the proposed project area is comprised of intertidal mudflats characterized by "leopard skin" pattern of eelgrass distribution, where eelgrass occurs in depressions that retain water during low tide.[36] Implementing small buffers of one to five meters around eelgrass would create a patchwork of aquaculture sites that would likely require frequent movement around eelgrass areas, exposing the sites to unavoidable impacts such as trampling, boat propeller damage, and marine debris.[37] The Coastal Commission notes that "the environment often presents challenges to these structures and materials due to unanticipated degradation, movement, burial, loss and discharge, potentially resulting in the creation and release of marine debris. If it remains uncollected, such debris may pose a threat to marine habitats and wildlife." Therefore, due to the effects of routine maintenance activities as well as the likelihood of marine debris impacts, we believe that aquaculture activities are incompatible with resource protection within patchy (<84% cover) eelgrass habitat. AUD 13

The Project Would Have Significant Effects on a Habitat Area of Particular Concern

Federal fisheries management regulations protect eelgrass habitat due to its vital role in supporting commercially targeted fish populations. The Fishery Management Plan for the Pacific Coast Groundfish Fishery and regulations implementing essential fish habitat (EFH) designations for this fishery include Humboldt Bay as a Habitat Area of Particular Concern (HAPC) for Estuaries and for Sea Grass.[38] An HAPC is an area within designated EFH that is "rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts."[39] In designating sea grass habitat as an HAPC, fishery managers noted that such habitats are of ecological importance and sensitive to human-induced

[34] *Id.* at 210.
[35] *See also* 40 C.F.R §§ 230.1, 230.43 (EPA Clean Water Act Section 404(b)(1) Guidelines, explaining that degradation of "special aquatic sites" such as eelgrass "is considered to be among the most severe environmental impacts covered by these Guidelines").
[36] Schlosser, S., and A. Eicher. 2012. The Humboldt Bay and Eel River Estuary Benthic Habitat Project. California Sea Grant Publication T-075.
[37] Tallis, H., J. Ruesink, B. Dumbauld, S. Hacker, L. Wisehart. 2009. Oysters and aquaculture practices affect eelgrass density and productivity in a Pacific Northwest Estuary. Journal of Shellfish Research 28(2): 251-261.
[38] Pacific Coast Groundfish Fishery Management Plan. Essential Fish Habitat Designation and Minimization of Adverse Impacts Final Environmental Impact Statement Prepared by National Marine Fisheries Service Northwest Region; 50 C.F.R. §§ 660.395, 660.399.
[39] NOAA Fisheries. 2015. Habitat Areas of Particular Concern.
http://www.westcoast.fisheries.noaa.gov/habitat/habitat_types/HAPC.html

environmental degradation. The Pacific Fishery Management Council (Council) notes that "designating HAPCs allows managers to focus their attention on conservation priorities during review of proposals, gives those habitats extra management protection, and gives the fish species with HAPCs an extra buffer against adverse impacts."[40]

Under the federal Magnuson-Stevens Fishery Conservation and Management Act, the Council shall make recommendations to NMFS and relevant state agencies concerning activities (like this Project) that the Council determines are likely to adversely affect the habitat of anadromous fish.[41] In addition, upon receiving informing that an action authorized, funded, or undertaken by a state agency would adversely affect EFH, NMFS must recommend measures to conserve that habitat.[42]

Loss of Eelgrass Habitat Is a Significant Environmental Effect and Allowing Such Loss Is Incompatible with Applicable Law and Policy AUD 13

Humboldt Bay contains approximately 5,646 acres of eelgrass, which represents between 45-53% of the state's total eelgrass.[43] Eelgrass is the dominant macrophyte of the shallow subtidal and lower intertidal zones. Eelgrass is one of the rarest yet most productive habitats in California. Collectively, just five bays—Humboldt, San Francisco, San Diego, Mission, and Tomales—support more than 80% of the known eelgrass in the state. The uneven distribution of eelgrass resources increases the risk to this habitat and contributes to its dynamic nature. Further, the narrow depth range within which eelgrass can occur further places this habitat at risk in the face of global climate change and projected sea-level rise.

Because eelgrass is highly productive, it is considered to be a foundation or habitat-forming plant species. Eelgrass contributes to ecosystem functions at multiple levels: as a primary and secondary producer, habitat structuring element, substrate for epiphytes and epifauna, and a sediment stabilizer and nutrient cycling facilitator. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl and sea turtles, and spawning surfaces for invertebrates and fish, such as Pacific herring. Indeed, eelgrass is an essential refuge, foraging, and spawning habitat for many marine species, including such economically valuable species as Pacific salmon, Pacific herring, and Dungeness crab.[44] Dungeness crab adults are found in subtidal or intertidal areas on sand, mud, or associated with eelgrass beds. Bare habitats are infrequently used by juveniles, most likely due to a lack of refuge from predation and decreased food abundance. Vegetated, intertidal estuaries appear to be important nursery habitats for young crabs.[45] Eelgrass also is a source of organic carbon in

[40] Pacific Fishery Management Council. 2014. Backgrounder: Essential Fish Habitat.
[41] 16 U.S.C. § 1855(b)(3)(B).
[42] 16 U.S.C. § 1855(b)(4)(B).
[43] Schlosser, S., and A. Eicher. 2012. The Humboldt Bay and Eel River Estuary Benthic Habitat Project. California Sea Grant Publication T-075.
[44] Plummer,M. et al. 2013. The Role of Eelgrass in Marine Community Interactions and Ecosystem Services: Results from Ecosystem-Scale Food Web Models Ecosystems Volume 16, Issue 2, pp 237-251
[45] University of Washington. 2015. Encyclopedia of Puget Sound: Dungeness Crab.

estuarine and nearshore marine food webs, thus contributing to productivity beyond the eelgrass beds themselves. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help offset carbon emissions.[46] AUD 13

The Project Would Have Significant Impacts on Pacific Herring and Commercially Important Fish and Crabs

Humboldt Bay is the third largest spawning site for herring in California. The Department of Fish and Wildlife has mapped persistent spawning habitat for herring in Humboldt Bay (Figure 2). Due to the foundational importance of herring as prey for salmon and wildlife, a primary goal of the DFW's herring commercial fishery program is to "safeguard herring as an important forage species for all living resources of marine and estuarine ecosystems that utilize herring as a food source."[47] The DEIR states that the project would have a less than significant impact on spawning herring through the mitigation measures BIO 3-5 (eelgrass avoidance by boats; eelgrass avoidance by culture equipment; avoidance of shell deposition) and BIO 7 (spawning herring avoidance and egg deposition on aquaculture equipment). We strongly disagree with this assertion. For the reasons described below, these mitigation measures do not reduce impacts to a less than significant level. AUD 14

Conserving Pacific herring is a particularly high priority in light of herring's role as prey for salmonids and therefore supporting a direct commercial fishery.[48,49] Adverse impacts to herring have a significant potential to adversely impact salmonids. Adverse impacts to salmon are particularly significant in light of their imperiled status. Chinook salmon, coho salmon, and steelhead are protected under both the California and federal endangered species acts. In addition to relying on the herring spawned in Humboldt Bay as a critical food source, these species rely on Humboldt Bay itself as part of their habitat. In fact, Humboldt Bay is included in designated critical habitat for Chinook salmon, coho salmon, and steelhead under the federal ESA. Herring and their roe also are key prey for Dungeness crab, brant and other wildlife including a variety of Pacific Flyway shorebirds and waterbirds. Any level of adverse impact to herring spawning success is therefore unacceptable.

The proposed Project area includes known herring spawning areas, as shown in Figure 2. The best available scientific information, combined with the key importance of herring as prey for salmon and the whole marine ecosystem, shows that every spawning area for this key forage species is essential. Within spawning habitat, numerous factors, such as environmental variables and fish abundance, influence the locations where spawning occurs in a given year, and this

[46] Simenstad, C. A., and R. C. Wissmar. 1985. Delta carbon-13 evidence of the origins and fates of organic carbon in estuarine and nearshore food webs. Marine Ecology Progress Series 22:141-152.
[47] DFW. 2015. Pacific herring commercial fishing regulations: Final Supplemental Environmental Document.
[48] Brodeur, R.D. 1990. A synthesis of the food habits and feeding ecology of salmonids in marine waters of the North Pacific. (INPFC Doc.) FRI-UW-9016. Fish. Res. Inst., Univ.
Washington, Seattle. 38 pp.
[49] Merkel, T. 1957. Food habits of the king salmon, Oncorhyncus tshawytscha, inh the vicinity of San Francisco, CA. CDFG 43:249-270.

spatial diversity of spawning locations promotes population resiliency and may enable the population to spawn in years with varying environmental conditions: According to Fisheries and Oceans Canada, the federal agency responsible for managing the west coast's most numerous herring spawning areas, "The locations that support large and repetitive spawnings deserve the most attention and consideration from possible environmental impacts."[50]

As noted above, both the CEMP and the Humboldt Bay Management Plan emphasize avoidance of impacts to eelgrass habitat, including a 5-meter unvegetated perimeter around eelgrass stands. This indicates that aquaculture equipment must be spaced at least 5 meters from the area's eelgrass in order to protect the function of eelgrass habitat. AUD 14

The statement that herring can "successfully reproduce with eggs deposited on shellfish culture equipment" is not only unsubstantiated but is contradicted by the best available science. While herring will to some extent spawn on hard natural and artificial substrates, such as unsilted gravel and pilings,[51,52,53,54] artificial surfaces do not provide the same quality spawning habitat as eelgrass. Indeed, a study in Puget Sound found that "[t]he local disappearance of some eelgrass meadows has led to the cessation of herring spawning activity in particular areas."[55]

The Project is also likely to disturb holding and spawning herring through routine maintenance operations. The Washington Department of Fish and Wildlife notes that "[c]onservation of herring spawning habitat, and *minimizing disturbance in the prespawning holding areas* (emphasis added) is key to the preservation of the herring stocks inside Puget Sound."[56] The same principles apply in Humboldt Bay.

The project's likely significant adverse impacts on herring are all the more serious in light of the reduced abundance of Pacific herring stock abundances on the West Coast, [57] including in Humboldt Bay. From 1974 to 2007, herring biomass estimates for Humboldt Bay averaged just under 400 tons. Herring returns weakened dramatically between 2000 and 2007—the last year

[50] Hay. D. 2013.Herring spawning areas of British Columbia: a review, geographic analysis, and classification. Fisheries and Oceans Canada. Internal Report.
[51] Shelton. A., T. Francis, G. Williams, B. Feist, K. Stick and P. Levin. 2014. Habitat limitation and spatial variation in Paciific herring egg survival. Mar Ecol Prog Ser vol. 514: 231-245
[52]Haegele, Schweigert, J. 2011. Distribution and Characteristics of Herring Spawning Grounds and Description of Spawning Behavior. Canadian Journal of Fisheries and Aquatic Sciences, 1985, 42(S1): s39-s55, 10.1139/f85-261 Canadian Journal of Fisheries and Aquatic Sciences, 1985, 42(S1): s39-s55, 10.1139/f85-261
[53] DFW. 2014. Pacific herring commercial fishing regulations: Final Supplemental Environmental Document.
[54] Shelton. A., T. Francis, G. Williams, B. Feist, K. Stick and P. Levin. 2014. Habitat limitation and spatial variation in Pacific herring egg survival. Mar Ecol Prog Ser vol. 514: 231-245
[55] Gaeckle, J. L., P.Dowty, H. Berry, and L. Ferrier. 2009. Puget Sound Submerged Vegetation Monitoring Project: 2008 Monitoring Report, Nearshore Habitat Program. Washington State Department of Natural Resources, Olympia, WA
[56] Washington State Department of Fish and Wildlife. Pacific Herring Information Summary. http://wdfw.wa.gov/conservation/fisheries/PacificHerringInformation_121911.pdf
[57] McKechnie, I. et al. 2014. Archaeological data provide alternative hypotheses on Pacific herring (Clupea pallasii) distribution, abundance, and variability. Proceedings of the National Academy of Sciences. E807–E816.

spawning biomass was assessed in Humboldt Bay—when biomass had fallen to 7 tons.[58] According to preliminary analyses from the Farallon Institute for Advanced Ecosystem Research, there has been a statistically significant negative linear trend in herring spawning biomass in Humboldt Bay from 1974-2007.[59]

The Importance of Pacific Herring to Wildlife

AUD 14

Recent analyses of predator diets in the California Current System (British Columbia through Baja California) highlight the importance of herring to predators. For 32 predators evaluated in this region, Pacific herring ranks as the fourth most significant prey species out of a total of 27 prey species. [60]

Herring and their roe provide a persistent, energy-rich, and aggregated food source for a wide suite of bird species. Herring aggregate to spawn in the late winter and spring, and their eggs are highly available, energetically rich, and high in lipids. Spawning locations are localized and herring eggs are abundantly available for several weeks. Herring roe are eaten by dozens of bird species, including brant, American wigeon, lesser and greater scaup, harlequin duck, surf scoter, greater white-fronted goose, common goldeneye, black scoter, white-winged scoter, redhead, canvasback, bufflehead, ring-billed gull, glaucous-winged gull, Bonaparte's gull, western gull, and mew gull.[61] Adult herring are consumed by numerous marine birds including Brandt's and double-crested cormorants, brown pelicans, western grebes, terns, gulls, shearwaters, cormorants, common murre, auklets, tufted puffins, marbled murrelet, and brown pelican.[62,63]

Pacific sea ducks are more dependent on herring than other avian taxa. Harlequin ducks aggregate in British Columbia when feeding on herring roe,[64] and long-tailed ducks [65]seek out and preferentially feed on herring roe. Scoters in particular are highly dependent on herring roe for overwinter survival and breeding success. Scoters alter their movement and habitat use patterns in spring to take advantage of ephemeral and energy-rich herring roe, suggesting that

[58] DFW. 2007. Pacific herring commercial fishing regulations: Final Supplemental Environmental Document.
[59] Weinstein, A., Thompson, S.A., Krieger, K., Sydeman, W. Trends in spawning biomass of Pacific herring, *Clupea pallassii,* British Columbia through California. In prep.
[60] Ainley, D., P. Adams, and J. Jahncke. 2014. Towards ecosystem based-fishery management in the California Current System – Predators and the preyscape: a workshop. Unpublished report to the National Fish and Wildlife Foundation. Point Blue Conservation Science. Petaluma, CA.
[61] Bayer, R. 1980. Birds feeding on herring eggs at the Yaquina River Estuary, Oregon. Condor 82 (193-198).
[62] Elliott, M. R. Hurt and W. Sydeman. Breeding Biology and Status of the California Least Tern *Sterna antillarum browni* at Alameda Point, San Francisco Bay, California. Waterbirds. 30 (3).
[63] DFW. 1998. Final Environmental Document, Pacific Herring Commercial Fishing Regulations. 1998.
[64] Rodway, M, Heidi M. Regehr, John Ashley, Peter V. Clarkson,
R. Ian Goudie, Douglas E. Hay, Cyndi M. Smith, and Kenneth G. Wright. Aggregative response of Harlequin ducks to herring spawning in the Strait of Georgia, British Columbia. Can. J. Zool. 81: 504–514 (2003)
[65] Zydelis, R. and D. Ruskuyete 2005. Winter foraging of long-tailed ducks exploiting different benthic communities in the Baltic Sea. Wilson Bulletin 117(2):133–141, 2005

this food resource is of particular importance to these species.[66,67] The Pacific population of surf scoters have declined by 50-60% in the last 50 years,[68] while greater and lesser scaup, two other diving ducks that depend on herring roe, have declined by 15%.[69] Wintering piscivorous marine birds in Puget Sound have declined over decadal scales, likely reflecting a decline in herring, sand lance and smelt.[70] These decreases in herring spawning aggregations throughout the birds' ranges make the remaining spawning sites, like in Humboldt Bay, all the more significant and in need of protection. AUD 14

In sum, the project would likely have unavoidable significant impacts on herring by reducing the areal extent of dense eelgrass, a preferred spawning substrate, in the core spawning area and by disrupting and disturbing herring as they hold in pre-spawning areas and spawn. Based on available information, we strongly disagree that the proposed project will avoid significant impacts to herring spawning habitat and urge the Harbor District to ensure that any current or future proposal to expand aquaculture entirely avoid herring spawning habitat.

The Project Would Have Significant Impacts on Pacific Flyway Waterfowl and Shorebirds

The DEIR states that the Project will have less than significant impacts without mitigation on brant, other waterfowl and shorebirds. The DEIR asserts that the South Bay is more important for brant than the North Bay; that the eelgrass beds in the North Bay are less important as feeding, loafing and gritting areas; and that loss of habitat due to disturbance and direct habitat modification from the Project will not significantly impact habitat availability. These statements are speculative and unsubstantiated. AUD 15

The Project would vastly expand aquaculture operations in key foraging and resting habitats for shorebirds, brant and other waterfowl, and key foraging, resting, gritting and loafing areas for brant. Humboldt Bay has been designated by the National Audubon Society and BirdLife International as an Important Bird Area of national and global significance due to its importance to brant, other waterfowl, and shorebirds. Humboldt Bay's tidelands provide critical foraging habitat for waterbirds, especially during winter and migration periods. All four of the proposed intertidal culture sites are important for birds: for example "Intertidal 2" is considered by local birders and hunters to be a *de facto* refuge for waterbirds as it is characterized by high quality habitats and low levels of disturbance.[71,72] Subtidal areas are also important. Bird watching is

[66] Lok, E. et al. 2012. Spatiotemporal associations between Pacific herring spawn and surf scoter spring migration: evaluating a "silver wave" hypothesis. Marine Ecology Progress Series 457:139-150.
[67] Lok, E., M. Kirk, D. Esler and W. Boyd. 2008. Movements of pre-migratory surf and shite-winged scoters in response to Pacific herring spawn. Waterbirds 31(3) : 385-393.
[68] Trost, R. E. 2002. Pacific flyway 2001-2002 fall and winter waterfowl survey report. in U.S. Fish and Wildlife Service Office of Migratory Management, Portland, Oregon.
[69] Afton, A. D., and M. G. Anderson. 2001. Declining scaup populations: A retrospective analysis of long-term population and harvest survey data. Journal of Wildlife Management 65:781-796.
[70] Vilchis, I. et al. 2015. Assessing ecological correlates of marine bird declines to inform marine conservation. Conservation Biology Volume 29, Issue 1,
[71] Rosenberg, Steve. Personal Communication. March.
[72] Ogan, Chet. Personal Communication. March.

important to the economy and culture of the region, highlighted by the annual week-long Godwit Days festival. AUD 15

A. The Project Would Have Significant Impacts on Brant

Humboldt Bay is the most important spring staging area for brant in California, and one of the most important in the entire Pacific Flyway. Notably, these eelgrass beds host more than 60% of the total brant population each year.[73] An estimated 80,000 birds use the bay each year. In recent years, brant are thought to be increasingly found in the relatively quiet eastern section of the North Bay, the location of Intertidal 2, due to disturbance in the South Bay.[74]

Mitigation Measure BIO-1: Educational Meetings, does not represent a substantive mitigation measure for these impacts. We support the written and oral statements of California Waterfowl Association and Ducks Unlimited[75] that any expansion into areas important for brant would likely cause unacceptable impacts, in particular, regarding Intertidal Culture Site 2, totaling 364 acres of dense eelgrass, patchy "leopard skin" eelgrass and mudflat. Furthermore, existing mariculture activities likely already have a significant ongoing impact on brant and associated recreational hunting opportunities, which are a key part of the culture and economy of the Eureka/Arcata region. The California Waterfowl Association described legal precedent for protecting rights and privileges of waterfowl hunting in Humboldt Bay.[76] Those impacts need be evaluated in a cumulative impacts framework. AUD 16

Humboldt Bay's eelgrass beds provide overwintering brant with the bulk of their diet. Both the quantity and quality of Humboldt Bay's eelgrass are important for brant breeding success.[77] Brant do not use upland habitat for foraging. Human activities which have the greatest potential for physically degrading migration and wintering habitats include aquaculture.[78] After decades of low numbers, the Pacific population of brant has only recently increased above the continental management objective of 150,000 birds.[79] The brant's special dependence on eelgrass makes it particularly vulnerable to forced changes in their environment.[80] Availability and abundance of

[73] California Department of Fish and Wildlife. 2008. Status of the Fisheries. file:///C:/Users/aweinstein/Downloads/status2008eelgrass%20(1).pdf)
[74] Rosenberg, Steve. Personal Communication. March.
[75] Ducks Unlimited. 2015. Letter to Humboldt Bay Harbor, Recreation and Conservation District on the Initial Study: Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. February.
[76] California Waterfowl Association. 2015. Letter submitted to the Humboldt Harbor, Recreation and Conservation District Initial Study: Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. February.
[77] Schlosser, S., and A. Eicher. 2012. The Humboldt Bay and Eel River Estuary Benthic Habitat Project. California Sea Grant Publication T-075.
[78] Pacific Flyway Council. 2002. Pacific Flyway management plan for Pacific brant. Portland, Oregon: Pacific Flyway Study Committee, U.S. Fish and Wildlife Service.
[79] Olson, S.M. 2014. 2014 Pacific Flyway Data Book. Unpubl. Rept. USFWS Div of Migr. Bird Mgmt. Portland, OR
[80] Lavelle, Marianne. 2014. Good for the gander? As Alaska warms, a goose forgoes a 3,300-mile migration. Environmental Health News. October 30, 2014.

eelgrass is a major factor affecting distribution and abundance of brant during winter[81] and spring staging.[82, 83]

The DEIR states that "areas under and between aquaculture will continue to be available for foraging brant, but the extent this species will continue to forage in areas with culture and associated human disturbance is unknown." There is no evidence that brant would adapt to this type of disturbance. Brant's response to stimuli ranges from brief alert behaviors to immediate departure from a site. Excessive disturbances that interrupt foraging time are a concern because they can prevent birds from obtaining necessary resources for migration and egg-laying and thus lower reproductive performance.[84] Brant change their seasonal use patterns due to disturbance. In Washington, oyster farming activities were correlated with reductions in eelgrass abundance and in turn, significant decreases in brant use-days.[85] The proposed expansion would only further undermine the guidelines of the Pacific Brant Management Plan by removing areas of prime high-quality habitat for brant. AUD 16

B. The Project Would Have Significant Impacts to Pacific Flyway Shorebirds

The project would likely have significant impacts on shorebirds through loss of or damage to mudflat and eelgrass habitats and through increased disturbance. Although there is no doubt that the responses of shorebirds to habitat loss and degradation and human disturbance vary in degree depending on the species, season and particular circumstances, there is no support for DEIR's assertions that that "some species (and possibly most species) may be unaffected by the Project or could benefit from increased prey abundance under aquaculture beds, while others may tend to avoid aquaculture beds." In a state in which 70% of its intertidal wetlands were altered by 1979,[86] there are fewer and fewer alternative stopover or wintering sites. Moreover, a study of a reclaimed estuary in England indicated that numbers of shorebirds generally declined relative to national population trends and the percentage decreases in numbers were greater than, or equal to, the percentage reduction in total feeding area.[87]

Removing or degrading eelgrass would impact many bird species that prey on fauna associated with eelgrass beds. Shorebird species that forage in Humboldt Bay eelgrass beds include black-bellied plover, semipalmated plover, marbled godwit, black turnstone, long-billed curlew, dunlin,

[81] Lindberg, M.S., D.H. Ward, T.L. Tibbitts, and J. Roser. 2007. Winter movement dynamics of black brant. Journal of Wildlife Management 71: 534-540.
[82] Wilson, U.W., and J.R. Atkinson. 1995. Black brant and spring-staging use at two Washington coastal areas in relation to eelgrass abundance. Condor 97: 91-98.
[83] Moore, J.E., M.A. Colwell, R.L. Mathis, and J.M. Black. 2004. Staging of Pacific flyway brant in relation to eelgrass abundance and site isolation, with special considerations of Humboldt Bay, California. Biological Conservation 115: 475-486.
[84] Pacific Flyway Council. 2002. Pacific Flyway management plan for Pacific brant. Portland, Oregon: Pacific Flyway Study Committee, U.S. Fish and Wildlife Service.
[85] Wilson, U.W., and J.R. Atkinson. 1995. Black brant and spring-staging use at two Washington coastal areas in relation to eelgrass abundance. Condor 97: 91-98.
[86] Speth, J. 1979. Conservation and management of coastal wetlands in California. Stud. Avian Biol. 2:151-155.
[87] Burger, J. 1981. The effect of human activity on birds at a coastal bay. Biol. Conservation. 21:231-241.

whimbrel, willet, long-billed and short-billed dowitchers, sanderling, and lesser and greater yellowlegs. Waterfowl, including pintail, mallard, and green-winged and cinnamon teal feed on eelgrass seeds and infaunal bivalves.[88] Although long-billed curlews may avoid the most dense stands of eelgrass in Humboldt Bay, 200-300 curlews—representing about 1% of the entire world population—were found there in intertidal habitats and adjacent pastures on 6 surveys over a 2-year period. The areas they occurred included the project area.[89]

The Western Hemisphere Shorebird Reserve Network (WHSRN) recognizes Humboldt Bay as a "Site of International Importance" for shorebirds. During winter months, it is the second most important coastal site for shorebirds along the U.S. Pacific Coast (next to San Francisco Bay), supporting 7.7 percent of all wintering shorebirds. This includes 19.9% of all wintering marbled godwits; 15.9% of all wintering western sandpipers; 12.7% of all wintering least sandpipers; 10.7% of all wintering willets; and 8.9% of all wintering dunlin. Overall, 46 shorebird species have been recorded at the site including 30 that are regularly encountered. Highest numbers of shorebirds occur in the Humboldt Bay in the spring (April) with a high count of 83,647 birds (>23,000 dunlin, 6,900 marbled godwit, 7,300 western sandpipers.)[90] AUD 16

The high rate of disturbance caused by workers attending the mariculture areas would negatively impact birds and other wildlife through the energetic costs of flushing and loss of time in key foraging habitat. The notion as expressed in the DEIRs that "many birds will become habituated to human disturbance and only flush to nearby sites (and quickly returning after the activity is complete)" is speculative. This is especially true in migration when turnover times in migrating shorebirds are often rapid and there is little time for habituation during a phase of heightened energy demand for the migrants.[91] In one study on the effects of human activity on shore and water birds at a coastal wildlife refuge, birds were absent or disturbed 80% of the time in the presence of "men working."[92]

According to the DEIR, 435 acres of the expansion area (9% of Arcata Bay mudflats) represents "potentially suitable foraging habitat for shorebirds." The DEIR admits that farmworkers may disturb wildlife across their foraging habitat. During harvest periods, visits will be weekly while deployment or removal of lines "would be more intensive but less frequent, on the order of two to three weeks of daily visits at the beginning or end of the growing season." This level of disturbance would directly undermine state and federal guidance on protecting Pacific Flyway shorebirds. In addition, the overall project conflicts with guidance in the 2003 Southern Pacific

[88] Schlosser, S., and A. Eicher. 2012. The Humboldt Bay and Eel River Estuary Benthic Habitat Project. California Sea Grant Publication T-075.
[89] Mathis, R.L., M. A. Colwell, L.W. Leeman and T.S. Leeman. 2006. Long-billed curlews in intertidal habitats: scale-dependent patterns. Western Birds 37:156–168.
[90] Colwell, M.A. 1994. Shorebirds of Humboldt Bay, California: abundance estimates and conservation implications. Western Birds 25:137-146.
[91] Myers, J.P. et al. 1987. Conservation Strategy for Migratory Species. American Scientist 75:19-26.
[92] Burger, J. 1981. The effect of human activity on birds at a coastal bay. Biol. Conserv. 21:231-241.

Shorebird Conservation Plan, which sets forth priority conservation actions for this wetland that include "Prohibit[ing] further alteration of tidal flats for oyster culture."[93] AUD 16

The Project May Adversely Affect Threatened and Endangered Species

The proposed project area falls within known habitat for a number of species protected under the federal and state endangered species acts. Humboldt Bay is inhabited by multiple species listed as threatened under the federal ESA, including the Chinook salmon, coho salmon, steelhead, green sturgeon, Pacific eulachon, western snowy plover, and marbeled murrelet. In addition, the state-listed longfin smelt occurs here. The DEIR does not adequately analyze the project's individual and cumulative effects on these species, and instead, without substantiation, dismisses those effects as less than significant. For example, the DEIR dismisses impacts to salmon despite acknowledging that salmon, which use this area as a migratory pathway, avoid swimming under floating structures such as those the project proposes to use. The DEIR also acknowledges that the addition of vast new stretches of oyster beds will likely reduce the overall abundance of planktonic food and organic matter, which many small fish rely on as a food source. The reduction of planktonic food sources could directly affect smaller fish species and invertebrates, as well as listed species that eat those small fish and invertebrates. These impacts must be fully analyzed through CESA and ESA consultation with the DFW, NMFS, and FWS. AUD 17

The DEIR's Analysis of Cumulative Impacts Is Entirely Insufficient, Particularly in Light of the Significant Adverse Effects that Would Result from the Proposed Expansion of Coast Seafoods' Operations in Humboldt Bay

The DEIR's cumulative impact analysis fails the most basic requirements of CEQA. The Harbor District and Coast Seafoods projects combined would nearly quadruple the footprint of aquaculture in Arcata Bay, degrade about 8% of all remaining eelgrass habitat in California, disturb feeding shorebirds in about 9% of Arcata Bay mudflats, affect essential fish habitat for commercially important groundfish, and adversely affect key forage species and species protected under the ESA and CESA, including salmonid species that support commercial fisheries. Yet the DEIR simply waves away these impacts on the unsubstantiated assertion that the impacts of each project will be mitigated to a less than significant level, and thus both projects together will have less than a significant impact. The DEIR's conclusions are not supported by any scientific analysis or evidence and, as such, they violate CEQA. AUD 18

In its cumulative impact analysis and elsewhere, the DEIR fails to provide sufficient information about the severity and likelihood of project impacts. Where impacts are not certain, the DEIR simply assumes that they will be less than significant or made less than significant by likely mitigation measures. In some cases, the DEIR suggests that some monitoring and further study of impacts will take place. CEQA requires more. An agency cannot simply release a draft report "that hedges on important environmental issues while deferring a more detailed analysis to the AUD 19

[93] Hickey, C., Shuford, W. D., Page, G. W., & Warnock, S. 2003. The southern Pacific shorebird conservation plan: a strategy for supporting California's central valley and coastal shorebird populations. PRBO Conservation Science.

final [EIR] that is insulated from public review."[94] Rather, CEQA requires that the agency gather and analyze the information necessary to produce an informed determination on environmental impacts. AUD 19

In addition, the public must be given an opportunity to review that supplemental analysis. CEQA requires preparation and recirculation of a supplemental draft "[w]hen significant new information is added to an environmental impact report" after public review and comment on the earlier draft EIR.[95] The opportunity for meaningful public review of significant new information is essential "to test, assess, and evaluate the data and make an informed judgment as to the validity of the conclusions to be drawn therefrom."[96] AUD 20

The DEIR's assertions that the cumulative effects of the Harbor District's and Coast Seafood's proposed expansions, added to existing operations, are less than significant are also undermined by the history of Coast Seafoods' operations and CEQA review. In 2007, the Harbor District reviewed Coast Seafoods' existing operations and determined that scaling back Coast Seafoods' then *existing* operational footprint from 500 acres to 300 acres was a primary mitigation measure necessary to offset the overall project's adverse effects and obtain a Mitigated Negative Declaration.[97] Neither the Harbor District DEIR nor Coast Seafoods' Initial Study offers any explanation of how the current proposed expansion of operations into – and beyond – areas that were required to be set aside for mitigation just a few years ago can now be considered a less than significant impact. AUD 21

Indeed, CEQA prohibits an agency from deleting an earlier adopted mitigation measure without showing that the measure is now infeasible. The agency "must state a legitimate reason for deleting an earlier–adopted mitigation measure, and must support that statement of reason with substantial evidence."[98] The DEIR offers no legitimate reason, much less substantial evidence, to show that maintaining the previous mitigation measure of constraining the footprint of aquaculture operations is no longer feasible.

Conclusion

As explained above, we strongly oppose this project due to the significant, adverse impacts it would have on Humboldt Bay and the many special ecosystems and species that it supports. This project would have significant, unavoidable adverse effects on herring, birds, eelgrass function and ecosystem services, special status species, and federally managed commercial fish species including salmon and groundfish. AUD 22

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[94] *Mountain Lion Coalition v. California Fish and Game Comm'n*, 214 Cal.App.3d 1043, 1052 (1989).
[95] Pub. Resources Code § 21092.1.
[96] *Sutter Sensible Planning, Inc. v. Sutter County Board of Supervisors*, 122 Cal. App. 3d 813, 822 (1981); *City of San Jose v. Great Oaks Water Co*., 192 Cal. App. 3d 1005, 1017 (1987).
[97] Humboldt Bay Harbor, Recreation, and Conservation District. January 2007. Initial Study for Coast Seafoods Continued Humboldt Bay Oyster Culture.
[98] *Napa Citizens for Honest Government v. Napa County Board of Supervisors* (1st Dist. 2001) 91 Cal App. 4th 342, 359.

The DEIR fails in numerous ways to consider and address these impacts. It fails to adequately analyze the individual and cumulative impacts of the project; substantiate its findings with scientific evidence; offer sufficient mitigation measures to meet CEQA's mandate to avoid, then minimize, adverse impacts; to comply with relevant local, state, and federal laws and policies protecting natural resources; and to analyze a reasonable range of alternatives.

AUD 22

In order to cure the many DEIR defects identified in this letter, the Harbor District must obtain substantial new information to adequately assess the proposed Project's environmental impacts and identify effective mitigation and alternatives capable of alleviating the Project's significant individual and cumulative impacts. Given the unique and sensitive nature of the resources concerned, and the requirements of applicable law and policies, the only viable alternative in this instance may be the "No Project" alternative. Should the Harbor District decide to continue to pursue expanded operations, we request that it entirely revise and recirculate the DEIR so that the public and decision-makers can fully understand the Project's environmental consequences, allowing fully informed decision-making about the Project. We also urge the Harbor District to coordinate this process with other federal and state permitting processes by adopting the Coastal Commission's suggestion to convene a Joint Review Panel of responsible agencies to review both the Coast Seafoods and Harbor District proposed projects.

Finally, we urge the Harbor District to approach continued aquaculture operations and any proposed expansion of aquaculture operations in Humboldt Bay in the marine spatial planning framework described at the beginning of this letter. Such an approach would protect vital resources and provide and integrate important information to inform any future proposals to alter or expand aquaculture operations.

Thank you for your time and consideration.

Sincerely,

Andrea Treece
Staff Attorney
Earthjustice

California Campaign
Director
Oceana

Anna Weinstein
Seabird and Marine Program Director
Audubon California

Hal M. Genger
President
Redwood Region Audubon Society

cc:

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Ellie Cohen

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ecohen@pointblue.org

Figure 1. Oyster culch on longline aquaculture, Humboldt Bay, January 2015. Source: DFW.

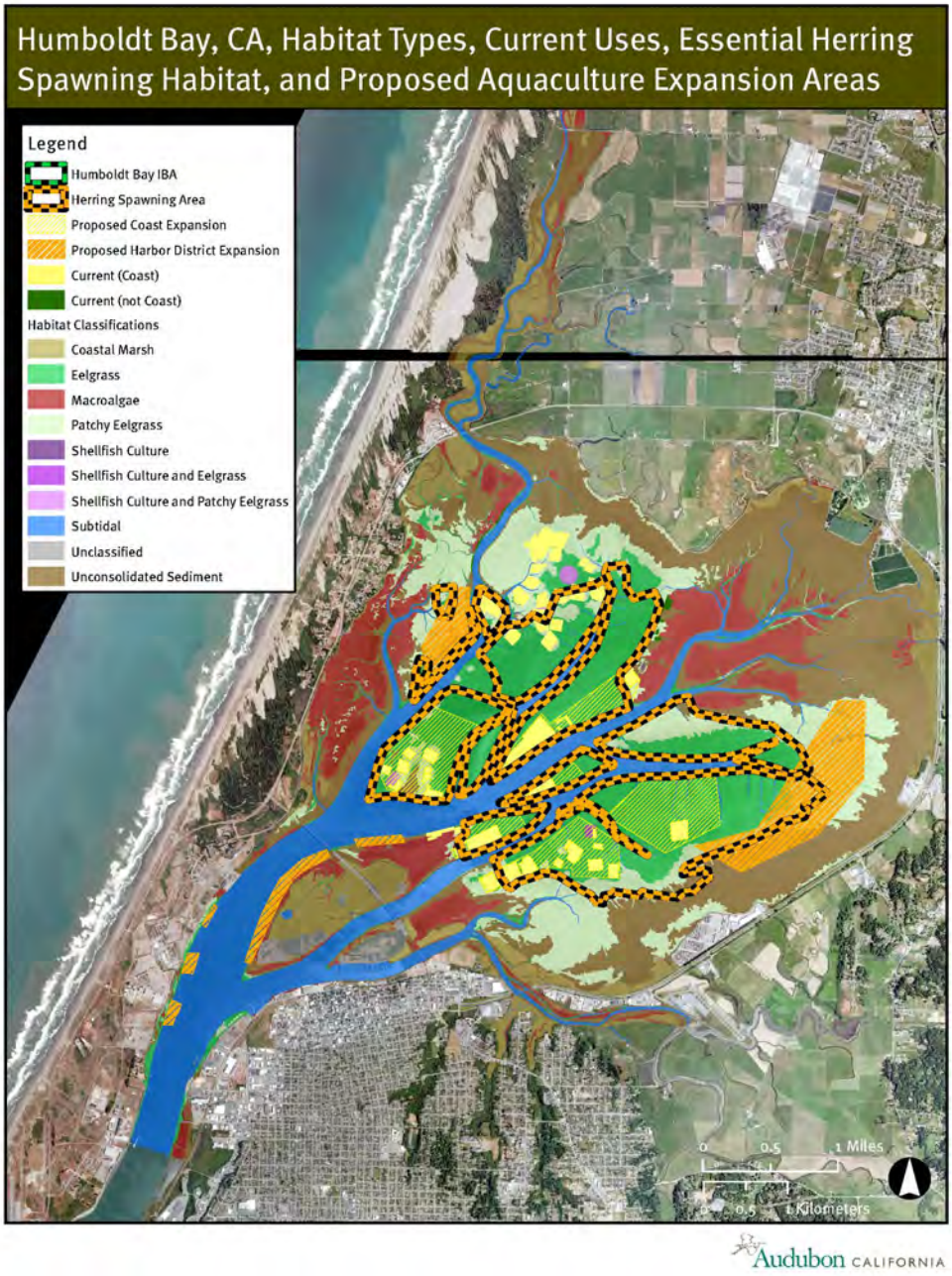


Figure 2. Current and proposed footprints of Coast Seafoods and Harbor District projects, and areas of persistent herring spawn (see key). Source: James Ray, Environmental Scientist, DFW, Eureka, CA.

Humboldt Bay Harbor District
Startare Drive
Eureka, California 95501
March 12, 2015

Re: Public Comment for Coast Seafoods Expansion, District "Pre- permitting" Proposals

I am writing to express my overall concern for both the proposed Coast Seafoods Mariculture Expansion and the Humboldt Bay Harbor District Proposal to "pre-permit" additional expanded mariculture areas in North Humboldt Bay. My concerns are two fold:

1. Abandon and lost mariculture debris
2. Continued intertidal habitat destruction, especially in East Bay.

Abandon Mariculture Debris

The first oyster beds in Humboldt Bay were established on the "Bracut" Flats in East Bay in 1910, these abandoned structures are still visible from the highway at low tide. Major oyster culture began in the 1950's. This included redwood slat fencing of beds (with built-in bat ray traps) and by the late 1960's and early 1970's, pressure treated 2" x 6"wooden racks with 1/8 inch wire hangers and black plastic pipe . Later, plastic vexar bags and "onion" bags were used for containing seed oysters. All of these components have been lost and scattered over time. Since 1974, I have fished Pacific Herring and anchovies in Humboldt Bay. All of these lost maricultrue objects continue to come up in my nets when fishing. Some areas in North East Humboldt Bay were unworkable due to mariculture junk on the bottom. Presently, I catch short PVC pipes – 3/4" x 2' in length, tangles of 1/4" polypropylene yellow rope with oyster shells, the occasional onion bag, and in East Bay, lost and abandon plastic "fathoms plus" Rock Crab traps purchased and distributed by the old "Coast Oyster Company". Probably the most terrifying are the lost steel cylindrical baskets (3' x 4' – weight about 80 pounds). These always tear completely through my nets. On one occasion, Coast Seafood lost 14 of these baskets. I was able to find and grapple 11 of these baskets. I have the position of one basket that I could not retrieve during my attempt to clean the fishing area. I also catch the newest items – 2'x2' trays with fine mesh bottoms and black mesh plastic cylinders with PVC floats attached with plastic wire ties. These items I find against my dock on Indian Island. Bates 1

Since the late 1970's, all commercial fishermen are required to have a "Marpol"(Marine Pollution Act) sign on board their vessels stating that it is illegal to introduce plastic anywhere (bays, estuaries, oceans) in the Marine environment. By my estimation, North Humboldt Bay probably contains more than 40 miles of PVC pipe. Before any expansion of mariculture takes place, the Harbor District needs to require growers to pay to clean up the debris already here.

Habitat Impacts

I have included my 1999 letter to the Army Corps of Engineers concerning habitat damage in North East Bay. I have also included Coast Seafoods response to my concerns. I have fished Pacific Bates 2

Herring in Humboldt Bay and assisted California Fish and Wildlife with both fish and eel grass survey work. It has been my understanding that the oyster growers (as a permit condition) are required to report herring spawning activity and further, to cease operations in those areas while herring eggs hatch. This has never happened to my knowledge. Until oyster growers honor the terms of their permits, I find the proposed expansion of mariculture in North Bay difficult to continue to support.

Thank you for considering my comments.

Sincerely,

Ken Bates F/V Ironic

cc: California Fish and Wildlife
U.S. Fish and Wildlife
California Coastal Commission

Lieutenant Colonel Richard G. Thompson
District Engineer

Attention: Regulatory Branch
Eureka Field Office
U.S. Army Corps of Engineers
P.O. Box 4863
Eureka, CA 95502

Re: The Coast Seafoods Permit Request
Number 2272ON

The Army Corps of Engineers Public Notice No. 2272ON makes no mention of adverse impacts to Humboldt Bay fish populations, in particular the impact on spawning Pacific Herring populations..

This paper reviews the behavior of spawning herring populations in Humboldt Bay: the ecological background-- the interdependence of tides, water salinity, the eel grass beds which provide the spawning grounds--and the impact of oyster culture. It also recommends two permanent area closures and a method of insuring clean up of mariculture operations upon their termination.

The Humboldt Bay Estuary is vital for local stocks of Pacific Herring (Clupea pallasi) in that the estuary provides a spawning and nursery area typified by calm protected water, low salinity and extensive eel grass (Zostera marina) beds as spawning substrate. In spite of the estuary's overall health, pollution free water and relatively low impact from shoreside human activity, the Humboldt Bay herring stocks are in serious decline. It is my opinion, based on 26 years of direct observation, that the decline of local herring stocks is a result of oyster mariculture operation's impact on Eel grass beds in north Humboldt Bay. While Department of Fish and Game marine resources personnel have been aware of the impact of Coast Seafoods activities to herring stocks (Ron Warner, 1996, personal communication) local Fish and Game biologists have taken no action to address the declining health of Humboldt Bay herring stocks

Bates 2

Pacific herring move into Humboldt Bay from late November to mid-March. Typically early season fish enter the bay and immediately turn north following the stronger tidal current that floods into north bay. These early fish work their way up the bay over a period of days to up to 2 weeks preparing to spawn. As they mature, these schools move farther up the bay during each low water cycle. When conditions are suitable, usually thought to be a drop in water salinity and a rise in temperature, herring move on to the grass covered tidal flats. As the tide floods, fish will stay on the flats until done spawning or until low water drives them back into the channels. On subsequent flooding tides spawning continues until the school is finished. Spawned out fish leave

the bay on the next outgoing tide in small schools and scattered individuals. Many can be observed jumping or flipping on the ocean surface.

Fish moving into the estuary later in the season (late January and February) move directly up to the spawning areas, forgoing the holding and maturing period of the early herring schools. These fish may enter and spawn within 1 to 2 days but their overall behavior is the same as early fish.

Nearly all herring spawn in Humboldt Bay is deposited on eel grass unlike spawning deposition in San Francisco and Crescent City where spawn deposits of up to 1/2 inch thick may be made on rocks and pier pilings. In contrast, spawn deposition In Humboldt Bay occurs on eel grass blades; between 10 and 50 eggs on a 3 foot long blade. The spawn is relatively light in any given area but covers many acres of eel grass substrate.

Bird predation is significant. During low water ducks, gulls and black brant can be seen feeding on herring eggs after a spawning event. In area of healthy undisturbed eel grass, birds are probably unable to consume all of the spawn because the largest portion of eggs will be covered by multiple layers of eel grass blades. It is likely that this covering of healthy grass also contributes to lower egg mortality by offering protection from desiccation and weather damage.

While I have observed limited and infrequent spawning events at King Salmon jetties, Hookton channel, South Port channel, the inside of South Jetty and the mouth of Elk River, 80 to 90 percent of all major spawns have taken place in North Bay (north of the Samoa bridge) during the past 26 years. Of these major spawns, the east bay and Gunther Island flats are the consistent location of choice for spawning herring. Only in years of very high fish abundance and heavy fresh water run off do spawning events also include Bird Island and areas at Sand Island flats. Lower salinity in these areas (Gunther Island and east bay) may contribute to the fishes apparent preferences. The lower salinity is a result of Freshwater creek's drainage.

At the stand of the tide, at low water, runoff from freshwater creek builds up in the creek mouth and inner reach channel. As the tide begins to flood this fresh water lens is forced back up the bay in a northeastward direction; above Daby Island and northeast up the Gunther island channel. The stronger flooding current in the Samoa channel keeps this freshwater lens from moving very far west in the bay during the flood. At the high water stand, parts of East Bay are covered with this low salinity water. As the tide begins to ebb this water is moved south and west, covering east bay and parts of Gunther Island flats for a second time. This may account for the apparent preference of spawning herring to utilize the East Bay and Gunther Islands flats.

Eel grass spawning substrate on East Bay and Gunther Island flats has been subjected to extensive and prolonged damage from oyster culture operations performed on those areas by first Coast Oyster Company and recently by Coast Seafoods Company. Both sites have been extensively impacted by continual use of hydraulic dredging, vessel towed dredges, direct cutting of eel grass by towed blades, and finally, eel grass beds have been paved over with hundreds of yards of illegally deposited crushed oyster shell.

While it is well documented that eel grass continues to impede oyster culture profitability, herring spawn have also impacted oyster growers' ability to harvest oysters during and after herring spawning events, especially in east bay and Gunther Island areas. During and after a spawning event gulls, ducks and black brant feed on herring eggs while simultaneously depositing fecal material, high in coliform bacteria. The resulting high bacterial counts have, in the past, closed North Bay to oyster harvest. during January and February. Elimination of eel grass in areas of oyster culture could conceivably alleviate some of the bacterial problems confronting oyster growers. While this statement is speculative, it is interesting to note that Coast Seafoods on January 27, 1999, harvested on both the Gunther Island and East Bay flats simultaneously, only 2 days after herring spawned on both those sites. There had been no dredge activity before that date on either site. I observed eel grass blades and whole plants, including root stock, drifting out of the Gunther Island channel with the outgoing tide during and after their harvest operation all that week.

Continual damage of eel grass habitat on Gunther island and East Bay flats may be responsible for a significant portion of the herring resources decline. When eel grass blades containing herring spawn are cut loose during oyster harvesting these blades drift out of Humboldt Bay with the outgoing tide. The grass ends up far from the estuary and mostly on ocean beaches. It is highly unlikely that eggs on this loose grass survive. Deposits on the intact eel grass have greater exposure thus subjecting them to higher rates of bird predation. In areas of heavy grass damage where only short stems are left, herring eggs are completely exposed; leaving them subject to any predation and to all adverse environmental conditions; a situation which is not conducive to egg survival.

Bates
2

As stated earlier, I have observed a steady decline in herring stock in Humboldt Bay in spite of the fact that Humboldt Bay has the most conservative fishery in California, and possibly anywhere on the west coast. No fishing is conducted during November or December or late March. Seines and other non-selective round haul nets are illegal. Fishing is limited to 150-fathom gillnets with 2 1/4 inch mesh size--the largest mesh in the state. Three quarters of the fish in any given school pass through these nets uncaught. The quota, 60 tons, is based on a spawning biomass of 400 plus tons which equals a theoretical harvest rate of fifteen per cent. Please note that this fifteen-percent harvest targets 5 year olds and over--the smallest portion of the available age classes. In spite of all these restrictions, herring stocks are declining. Fishing did not create this decline.

Although the herring fishery is not a major local industry, it provides employment for the fishermen, fish plant workers and truckers. It is an important export product, and, all money is spent locally creating a multiplier effect.

Coast Seafoods has spent considerable time and energy to modify outdated mariculture practices in Humboldt Bay. While they have had extensive experience observing oyster survival and harvest rate by various mariculture methods, it has not been their responsibility to insure healthy herring stocks or to maintain areas of undamaged eel grass.

To rectify this situation and to reverse the damage to East Bay and Gunther Island eel grass beds, I propose the following:

- No oyster culture or mariculture of any kind be allowed east of a north-south line 124 degrees, 08' 50"W on the Gunther Island flats.

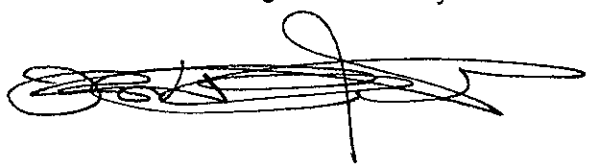
- No oyster culture or mariculture of any kind be allowed north of an east-west line 40 degrees, 49' 15" N and west of a north-south line 124 degrees 07' 35" W.

- That each and every oyster operation be required to post a performance bond to cover the cost of (1) clean-up and removal of abandoned mariculture equipment and (2) the cost of repair of adverse environmental impacts to bay tidelands

Bates 2

It is my opinion that the proposed closures and the posting of clean-up bonds funds will be a significant step toward the long-term viability of the Humboldt Bay Estuary.

Respectfully submitted,



Kenneth Bates
P.O. Box 660
Eureka, CA 95501
(707) 442 7382

24 February 1999

March 11, 2015

Mr. Jack Crider, Executive Director
Humboldt Bay Harbor, Recreation, and Conservation District
P.O. Box 1030
Eureka, CA 95502
Sent via email

Re: Comments on the Draft Environmental Impact Report for the Humboldt Bay Mariculture Pre-Permitting Project

Dear Mr. Crider,

On behalf of the members, board, and staff of Humboldt Baykeeper and Northcoast Environmental Center, we respectfully submit these comments on the Draft Environmental Impact Report for the Humboldt Bay Mariculture Pre-Permitting Project.

Humboldt Baykeeper works to safeguard our coastal resources for the health, enjoyment, and economic strength of the Humboldt Bay community. The Northcoast Environmental Center works to promote understanding of the relations between people and the biosphere and to conserve, protect, and celebrate terrestrial, aquatic, and marine ecosystems of northern California and southern Oregon. BK-1

The Humboldt Bay Mariculture Pre-Permitting Project proposes shellfish culture on 306 acres of patchy eelgrass, 48 acres on dense eelgrass, 114 acres on mudflats, and 14 acres for native macroalgae cultivation. We believe that the shellfish industry can be compatible with the conservation and recreation functions of the District. Whether shellfish can be sustainably produced in a larger area of Humboldt Bay will depend in large part on whether—and where—they can be grown with minimal impacts to eelgrass and other species that depend on a healthy bay ecosystem. Our specific concerns are discussed below.

Eelgrass and its Habitat: Shellfish culture is done on tidelands which are held by the State of California in trust for the public benefit. Eelgrass (*Zostera marina*) is one of Humboldt Bay's public trust resources. It is a species of great biological and economic importance in that it supports Dungeness crab, juvenile salmon and steelhead, Pacific herring, black brant, and numerous other wildlife species, some of which are important commercial fisheries. Because of its importance, state and

federal agencies' "no net loss" policies exist to prevent eelgrass destruction, including compensatory mitigation when impacts cannot be avoided.

Eelgrass is thought to play a critical role in buffering the pH of Humboldt Bay waters, which is important for all shell-forming marine life, including the commercial shellfish industry as a whole. Oysters and other suspension-feeding bivalves may play a beneficial role in turbid estuarine waters, functioning as biofilters to reduce excessive particulate material from the water column and allow enhanced levels of light penetration, enhancing eelgrass growth, which in turn benefits so many other species in Humboldt Bay. Although few native oysters persist in Humboldt Bay, commercially-grown oysters can play an important ecological function if they are cultivated using appropriate methods and magnitudes to avoid or minimize cumulative effects. BK-1

A number of studies have found that impacts to eelgrass vary with aquaculture methods, although no methods have been found to avoid impacts to eelgrass density and biomass entirely. A study done in Willapa Bay, WA concluded that all methods of shellfish production reduce eelgrass production, and that avoidance of eelgrass is the best strategy for eelgrass protection, although hand-picking minimizes impacts relative to longline culture.[1]

Regardless of which culture method is chosen, monitoring strategies should be developed to gather additional site-specific information on the impacts of shellfish culture on eelgrass over the life of the project, beginning with baseline surveys to establish pre-project conditions. BK-2

Black Brant: Avoidance of dense eelgrass patches would also lessen impacts to black brant, which feed almost exclusively on eelgrass. Humboldt Bay eelgrass beds are critical to migratory brant following the Pacific Flyway. Adherence to the state and federal agencies' no net loss policy for eelgrass would also lessen significant impacts to brant. BK-3

Recreation: Impacts to water-based recreation, particularly boating, canoeing, kayaking, and stand-up paddling should be assessed and avoided, in keeping with the Harbor District's mission to promote recreation on Humboldt Bay. BK-4

Aesthetics: Visual impacts in scenic coastal areas should be more thoroughly assessed to include reflections from shellfish equipment like clam rafts. Special attention should be given to areas designated as Coastal Scenic and Coastal View Areas in the Humboldt Bay Area Local Coastal Plan with regard to avoiding or minimizing aesthetic impacts. BK-5

[1] Tallis, H.M. et al. 2009. Oysters and Aquaculture Practices Affect Eelgrass Density and Productivity in a Pacific Northwest Estuary. *Journal of Shellfish Research* 28: 251-261.

Hazards and Hazardous Materials: Please address the inevitable loss of plastic gear and other debris, and how it will be cleaned up before it breaks down and pollutes the bay and ocean. Please analyze whether the expansion is in areas with elevated levels of dioxins and whether there is the potential for resuspension of dioxins from sediment disturbance or increased bioaccumulation. BK-6

Marine Mammals: In addition to Impact BIO-3, known seal haulout areas should be identified and avoided in siting shellfish production areas to minimize direct impacts as much as possible. BK-7

Nesting Birds: Coast Seafoods' 2007 Initial Study included a mitigation measure to avoid impacts to nesting Caspian terns and cormorants: "All oyster culture activities, for the bed identified in Attachment A as "Sand Island NK" will remain at least 100 meters away from the MHHW line of Sand Island." Potential impacts to nesting birds should be addressed and appropriate mitigation measures should be considered to avoid such impacts in this project as well. BK-8

Shorebirds: As noted in the Draft EIR, aquaculture practices have the potential to reduce the amount of foraging habitat for shorebirds and wading birds through habitat degradation and human disturbance. The shift in species diversity summarized in the Draft EIR fails to contemplate mitigation strategies for species that are likely to be negatively impacted. Potentially positive impacts to other species should not be regarded as mitigation for negative impacts to different species of shorebirds. In addition, since no studies have been done on impacts to shorebirds from rack-and-bag method of shellfish culture, it is difficult to conclude that no significant impacts will occur, since these culture methods involve more frequent visits by workers. BK-9

Cumulative Effects: Cumulative effects must be analyzed to consider all potential impacts of the proposed project as well as the Coast Seafoods Permit Renewal and Expansion Project, and any other reasonably foreseeable future shellfish projects. BK-10

We appreciate the District's initiative to streamline the permitting and environmental review process for a number of shellfish growers, since it undertakes a review of the cumulative impacts of these leases, rather than taking a piecemeal approach. Thank you for the opportunity to comment on the Draft EIR for the Humboldt Bay Mariculture Pre-Permitting Project. We hope that your project team finds these comments helpful. BK-11

Sincerely,

___s/_____
Jennifer Kalt, Director
Humboldt Baykeeper

___s/_____
Dan Ehresman, Executive Director
Northcoast Environmental Center

Adam Wagschal

From: Humboldt Bay Harbor District <greatwhitefisher@hotmail.com>
Sent: Wednesday, March 11, 2015 12:04 PM
To: kfarrell@humboldtbay.org
Subject: Form submission from: Contact

Submitted on Wednesday, March 11, 2015 - 12:03pm Submitted by anonymous user: [64.50.180.137] Submitted values are:

Your Name: Matt Brinkman
Email Address: greatwhitefisher@hotmail.com Phone Number:
Questions / Comments:
I recently discovered that there were plans to expand the oyster harvesting operations in Humboldt Bay, and I would like to express my concern. The expansion of the oyster beds will likely have a dramatic negative impact on the native wildlife, especially Black Brant and American Wigeon, as Humboldt Bay is an important wintering site for these waterfowl and both species rely heavily on the eelgrass as a food source. Many fish species may also be negatively impacted by the loss of eelgrass with the expansion of the oyster farming operations. In addition to the implications to native species, increasing the number of oyster beds in Humboldt Bay will affect the aesthetic value of the Bay by creating a less-than-natural looking landscape.
This will impact kayakers, boaters, and photographers alike.
Please take these concerns into consideration during your decision-making process.

MB-1

Sincerely,

Matt Brinkman

The results of this submission may be viewed at:
http://humboldtbay.org/node/5/submission/282

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105- 2219
VOICE AND TDD (415) 904- 5200
FAX (415) 904- 5400

March 16, 2015

Jack Crider
Humboldt Bay Harbor, Recreation and Conservation District
601 Startare Drive
Eureka, Ca 95501

Re: **Draft Environmental Impact Report for the Humboldt Bay Mariculture Pre-Permitting Project**

Dear Mr. Crider:

Thank you for considering the following input from the California Coastal Commission (Commission) staff on the January 15, 2015, Draft Environmental Impact Report (EIR) for the proposed Humboldt Bay Mariculture Pre-Permitting Project. This proposed project will require a coastal development permit from the Commission. As such, the Commission will use information contained in the EIR in its evaluation of the project's conformity with the resource protection and use policies of the Coastal Act. Although a coastal development permit application for this project has yet to be submitted to the Commission, we expect to receive this application within the next several months. CCC-1

Through the two comment letters provided to the Humboldt Bay Harbor, Recreation and Conservation District (Harbor District) in response to the Notices of Preparation for this project, as well as through additional discussions and conversations, Commission staff have provided the Harbor District with information, suggestions, and recommendations regarding the project itself and development of the content of the project EIR. While we appreciate the Harbor District's efforts, several Coastal Act issues and concerns are not adequately addressed in the January 15, 2015 draft EIR. Accordingly, herein we reiterate several of our previous information requests as well as provide new comments and suggestions regarding the content of the EIR.

Project Description

1. *Permit Compliance:* The project description notes that the Harbor District "will reserve the right to revoke the lease and require the removal of all cultured organisms and related equipment." (a) Retaining this right and enforcement ability is important, especially if it is strengthened with clear and transparent guidelines for when it would be invoked. Please describe the proposed type, magnitude, and/or frequency of non-compliance with lease requirements that would trigger lease revocation and removal activities. CCC-2 (b) Effective and thorough removal of cultured organisms and cultivation equipment is often CCC-3

a labor and capital intensive endeavor that can be made more so if management or operation of a lease area is out of compliance with lease requirements. The discussion on page two of the draft EIR notes that prior to finalization of a lease, potential lessees will be required to provide financial assurances for removal of all culture equipment and organisms – based on the estimated cleanup cost developed by the lessee and approved by the Harbor District. This approach appears modeled after the clean-up provision that has traditionally been included in aquaculture leases issued by the Fish and Game Commission. However, several recent examples suggest that these estimated clean-up costs can fall well short of the actual expense of successfully completing clean-up and removal activities. Learning from these examples, we suggest that the Harbor District consult with marine salvage professionals to establish in the EIR a per acre clean-up estimate (with appropriate adjustments made for type of cultivation gear, location, etc.) that includes permitting costs and contingency multipliers as well. Including this estimate in the EIR will allow for vetting and input that will likely result in the establishment of a more realistic financial assurance for clean-up. Further, allowing potential lessees to understand, in advance, the amount of this financial assurance will enable them to better plan and allocate for it. (c) Please also clarify in the EIR how complete clean-up would be achieved if the financial assurance proves to be insufficient. (d) Removal and clean-up of shellfish aquaculture development in intertidal and subtidal areas can be carried out to various degrees. For example, this can range from only removal of actively used growing structures and attached organisms to removal also of broken or abandoned structures and dislodged organisms and fragments such as shells. Please clarify the standard that would be applied to determine when clean-up and removal operations have been deemed complete. While the discussion on page two notes that "all culture equipment, including broken equipment as well as cultured organisms (attached and dislodged) will be removed," information is not provided describing the process and thresholds that would be applied to ensure that this level of removal is achieved. Please provide such details in the EIR, including if removal would include collection of equipment or debris that may disperse outside of the lease area, how it would be determined what equipment and material is associated with each individual operator, and if removal would apply to equipment and cultured organisms (or shell) that becomes partially or wholly buried.

CCC-3

CCC-4

CCC-5

2. *Proposed Culture Sites:* (a) Please describe in additional detail the selection criteria and methodology used to select the location, size, and configuration of the four proposed intertidal and three subtidal culture sites. (b) This description should include a discussion of alternative sites, sizes, and configurations of these sites and others that were considered and rejected as well as the reasons for their rejection. (c) This description should be provided in the highest level of detail possible. For example, if certain substrate qualities, elevations, distances from channels, amounts of eelgrass, etc. were used to select potential candidate sites, these criteria should be provided and explained and the method by which the data were obtained should be described. The general note on page four that sites were selected based on "good potential for successful mariculture based on input from local mariculturists" does not provide the level of detail or specificity required to understand and assess the site selection process or selected sites.

CCC-6

3. *Lease Inspections:* The draft EIR notes on page two that potential lessees will provide to the Harbor District for approval a site-specific description of their proposed activities (a

CCC-7

"culture description") and that Harbor District staff will visit each culture site during and after planting and at least once per year thereafter to ensure compliance with lease requirements. (a) To ensure compliance with other regulatory requirements, these lease inspections should result in reports submitted to other permitting entities (Commission and Army Corps of Engineers, for example) and include an assessment of the proposed culture description versus "as built" condition (operations, locations, methods, equipment, etc.). (b) Inspection reports should also document the state of operations and upkeep on the site (including the presence of discarded, broken, or abandoned tools, gear, and equipment) and include photographs. CCC-7

4. *Rack and Bag Culture Method:* (a) Please describe the size of mesh bags and the mesh size that would be used. (b) Please also describe how the industrial rubber bands would be used and any measures that would be required to address breakage, loss, and discard of rubber bands during operations. (c) Please also describe alternative attachment methods or materials that were considered that would eliminate this potential source of marine debris (for example, the use of a bar attached to the rack structure that could be lowered and secured to maintain the bags in place). CCC-8
5. *Longlines:* (a) Please describe how shell would be affixed to the lines. (b) Please describe how PVC stakes are maintained and accounted for – for example, how often are stakes required to be replaced to prevent breakage and loss? (c) Please also explain the selection of PVC stakes over other materials such as wood – does PVC attract fewer fouling organisms? Is it less expensive? Does it last longer?
6. *Baskets on Longlines:* (a) Please describe if the sleeve surrounding the monofilament basket line is a separate piece or material integrated into the monofilament line. (b) Please also describe the plastic clips used to attach the baskets to the lines and known instances or opportunities for these clips to fail, become dislodged, or break. (c) Please describe the floats used to increase the buoyancy of the baskets – are these floats maintained inside the baskets or attached to the lines? What material are these floats comprised of? How are they attached to the baskets or lines? Are these floats known to break or become dislodged?
7. *Basket Harvest:* (a) Please describe techniques, equipment, and methods used to harvest baskets.
8. *Longline Harvest:* (a) Please include a discussion of the differences between the three proposed harvest methods. This discussion should focus on differences that may affect the likelihood and magnitude of potential adverse environmental impacts – including the duration of harvest, associated benthic disturbance, and the displacement and/or loss of shell or culture gear.
9. *Installation of Culture Equipment:* (a) Please provide a detailed description of all activities that would be carried out to install the three proposed types of culture equipment. This description should include a discussion of the use of staging areas, mechanized equipment, vessels and tools, and the duration of installation activities.
10. *Subtidal Culture:* Aquaculture operators may be interested in using culture rafts or FLUPSYS as an on-water operations center to reduce transport of materials and equipment from shore. (a) Please describe if overnight mooring, storage or attachment of vessels, barges or materials and equipment can occur on the subtidal cultivation rafts or FLUPSYs. CCC-9 (b) Please provide figures depicting the proposed build out of the subtidal culture locations with rafts, longlines, FLUPSYs, and associated walkways and decking. CCC-10

(c) Please provide an explanation for the need for the amount/number walkways and decking proposed in addition to that provided on rafts and FLUPSYs. (d) Please clarify if the proposed layout of structures at site three would be used at the other sites as well. (e) Please augment the discussion of the benthic footprint of subtidal sites to include alternative mooring or anchoring systems such as helical screw anchors or "dead men." (f) Please expand Section 2.5 to include a discussion of algae cultivation longlines. (g) Please clarify if Tables 6 and 8 include algae culture longlines and mooring piles. (h) Please describe the specific proposed locations of each of the 32 piles. CCC-10 CCC-11 CCC-12

11. *Farmworker Visits and Estimated Activities:* The draft EIR notes that estimates of the number of worker visits and activities were developed through consultation with several aquaculturists with a long history of managing operations in Humboldt Bay. (a) Please consider if it would be appropriate to increase these estimates to reflect that potential lessees are likely be smaller and less experienced and may not to have the same level of operational efficiency as the more established operators and their employees that these estimates appear to be based on. (b) Please address the apparent discrepancy in Tables 3 and 4 regarding the application of activity estimates for individual culture units to large groups of culture units. CCC-13 CCC-14

Biological Resources

12. Pile installation: (a) Please expand the proposed evaluation of the biological effects of installing piles to include the long-term and temporary loss of benthic habitat associated with the presence of the piles and installation activities. (b) Please also include an evaluation of alternative types, configurations, sizes, materials, and numbers of mooring devices that were considered and rejected in favor of the proposed 32 18-inch steel or concrete piles. (c) Please also include in the discussion of pile driving impacts on page 64 an estimate of the peak underwater and above water sound pressure levels and accumulated sound exposure levels that would be generated by the proposed pile driving and describe the specific sound reduction methods that would be required to be used during pile installation (such as the use of wooden dampeners, low-power pile driver settings, wrapped piles, etc.) to bring these levels below established thresholds. (d) Please describe the origin and basis for cited thresholds of "cumulative sound exposure level of 183 dB re: 1 µPa2*sec and peak sound pressure of 180 dB re: 1 µPa peak" as measured 10m from the source. The appropriate marine mammals sound thresholds should be based on the most sensitive species with the potential to occur at the project site – in this case, the harbor porpoise (*Phocaena phocaena*). Based on the work of Lucke et al. (2009), the peak-to-peak received sound pressure level and sound exposure level shown to consistently result in aversive behavioral reactions are significantly lower for harbor porpoise than those proposed in the draft EIR. The EIR should revise the proposed safety zone and sound impact thresholds to provide a more appropriate level of protection for the harbor porpoise. (e) In addition, hydroacoustic monitoring should be required and implemented to ensure that sound thresholds are not exceeded; please also explain how the dual (peak and accumulated) sound level thresholds would be applied during pile driving activities to prevent injury to fish. As specified in the interagency Fisheries Hydroacoustic Working Group June 12, 2008, memorandum, pile driving activity shall immediately cease if at any time: (i) the recorded peak sound pressure level exceeds 206 dB re: 1 µPa peak; or (ii) the calculated accumulated sound exposure level CCC-15

(SEL) exceeds 187 dB re: 1 µPa2 - sec. The discussion on page 64 of the EIR does not reference these thresholds for fish or describe if or how they would be implemented or monitored (for example, through use of underwater acoustic monitoring devices). (f) In addition, please also include a discussion of above water sound levels that would be generated during pile driving and how adverse impacts to sensitive avian populations (such as nesting osprey) or other terrestrial wildlife from these sound levels would be avoided. CCC-15

13. *Shorebirds:* (a) Several statements on pages 49 and 51 refer to the lack of available studies on shorebird responses to the type of shellfish aquaculture equipment proposed in this project. However, the study carried out in Tomales Bay by Kelley et al. (1996) that is cited in the draft EIR included an assessment of shorebird response to rack and bag cultivation equipment. The EIR should include a discussion of this study and its findings. CCC-16 (b) The discussion on pages 48 through 52 appears to conclude, in part, that adverse impacts to shorebirds resulting from the placement of structures on intertidal habitat would be less than significant because the project would only affect a small portion of available intertidal mudflat habitat. Inherent in this conclusion is the assumption that all available habitat experiences similar shorebird use patterns. Please provide evidence supporting this assumption.

14. *Impact BIO-5:* The discussion and conclusion in this section appears to rely, in part, on the assumption that marine mammals or seabirds "are not expected to congregate in large numbers" on the subtidal aquaculture structures. However, Commission staff has confirmed that several of the existing subtidal aquaculture structures in Humboldt Bay frequently support large numbers of predatory seabirds such as brown pelicans. In addition to likely increasing predation rates in proximity to these sites, seabird and marine mammals that roost on these structures may be susceptible to injury, entanglement, and disturbance. As such, we recommend that the discussion on page 56 be revised to (a) reflect the known occurrence of roosting on aquaculture structures in the project area and (b) to include a contingency measure – such as the installation of physical barriers to roosting – to be applied if seabird or marine mammals congregate on the proposed structures. CCC-17

15. *Impact BIO-6:* Please expand the discussion of artificial lighting to include the proposed location, types, frequencies, and durations of proposed lighting at the project sites as well as an explanation for the need for such lighting. CCC-18

16. *Impact BIO-12:* (a) Please provide a figure showing the locations of patchy and dense eelgrass relative to the proposed lease areas. (b) Please also show the locations of proposed boat routes and describe if these routes are expected to partially or entirely avoid areas of mapped eelgrass. (c) Please explain why culture sites were not selected to completely avoid mapped areas of dense eelgrass. (d) Please provide scientific justification for the avoidance of adverse impacts to eelgrass provided by the proposed 1-m buffer between culture equipment and eelgrass plants. (e) Please also clarify if this requirement would only apply to the initial installation of culture equipment or all future placements. (f) Please clarify that eelgrass mapping referred to in Mitigation BIO-4 would be carried out consistent with the mapping guidance provided in the California Eelgrass Mitigation Plan. (g) Despite the proposed prohibition on the intentional deposition of shell provided in Mitigation BIO-5, accidental deposition often occurs. Please describe how this impact would be addressed. (h) The discussion on page 60 of CCC-19

the draft EIR notes that despite the incorporation of the mitigation measures, some impacts to eelgrass will nevertheless occur. Please quantify these expected adverse impacts to the density and distribution of eelgrass and why this amount of impact would not be considered significant. CCC-19

17. *Impact BIO*-14: Please clarify in Mitigation BIO-6 that self-cleaning screens must achieve full clearance of the entire screen face at least once every five minutes. CCC-20

18. *Impact BIO*-15: The conclusion that constraining the ability of eelgrass to colonize higher elevations would not result in a significant impact appears to be based on the assumption that "eelgrass and shellfish culture will be expected to and allowed to co-exist." Insufficient scientific justification and support for this conclusion is provided. The study cited as support – Rumrill and Poulton 2004 – did not include an evaluation of rack and bag or basket on longline culture methods. Further, the results of this study, though limited by issues of experimental design and statistical analysis, such as pseudoreplication, demonstrated adverse impacts to eelgrass density and percent coverage at the longline spacing proposed by the project. Therefore, assuming that eelgrass and culture equipment may co-exist without impacts to eelgrass is not a justified conclusion based on the reference cited. Please revise the discussion of Impact BIO-15 to address these issues. CCC-21

19. *Impact BIO-16:* The proposed mitigation measures to address potential adverse impacts to Pacific herring (*Clupea pallasi*) – Mitigation BIO-7 – requires pre-work visual surveys of spawning from December through February and a two-week postponement and notification to the California Department of Fish and Wildlife if evidence of spawning is observed. This management measure is adapted from Special Condition 3 of the coastal development permit for Coast's current culture operations (CDP No. E-06-003). In the nearly ten years that this requirement has been in place, it has resulted in no reported observations of herring spawning activity. Given the observations recorded over the past ten years by the California Department of Fish and Wildlife of herring spawning activity in portions of Humboldt Bay in close proximity to Coast culture areas, the results of this monitoring effort are unexpected, and suggest either way that the monitoring is ineffective of that culture activities prevent herring spawning. We therefore recommend the EIR evaluate the effectiveness of this visual survey monitoring approach as a means of assessing spawning activity and avoiding adverse impacts to herring. The EIR should consider any adaptations or modifications to this management practice that may be warranted to ensure adverse impacts to herring spawning are avoided or minimized and to increase the accuracy of monitoring and accounting of potential impacts from aquaculture operations. CCC-22

20. *Impact BIO-18: (*a) Please review and cite more current information regarding the successful spawning and naturalization of Pacific oysters (*Crassostrea gigas*) in California. Wild populations of Pacific oyster have been observed at a variety of locations in southern California, including the Ports of Long Beach and Los Angeles, Alamitos Bay, and Mission Bay and successful seed sets have been observed (Commission staff personal observations, D. Zacherl pers. com., California Sea Grant 2013). In addition, evidence from other locations suggests that changes in water temperature can lead to rapid expansion of Pacific oyster populations in the wild (Dutertre et al. 2010). (b) Given this more recent information, the draft EIR's apparent conclusion that successful spawning of Pacific oysters cannot occur south of Washington CCC-23

State – based on a dated reference and current conditions - is insufficient justification for the dismissal of this issue. Please provide a more thorough analysis of the naturalization potential of Pacific oyster in Humboldt Bay, including an assessment of how this may change in the future as environmental variables such as water temperature respond to climate change, and consider whether the the application of mitigation measures would be warranted to address it. CCC-23

Marine Debris

21. Shellfish aquaculture relies on the placement of large amounts of equipment and materials in the marine environment, including plastic containers (mesh bags and baskets), ropes, stakes, and plastic or metal fasteners. These materials can break or become dislodged, buried, and dispersed. In addition, operational practices can result in the loss and discard of additional tools, equipment, and debris. These materials, some of which are capable of persisting in the environment for long periods and dispersing widely, can pose a threat to marine wildlife, aesthetics, and navigational safety. (a) Please include in the EIR a discussion of the potential environmental impacts of marine debris associated with aquaculture operations as well as appropriate impact avoidance, minimization, and/or mitigation necessary to adequately address it. (b) This discussion should include an assessment of the debris risk associated with different materials and culture practices and an evaluation of whether high risk materials (such as single use zip ties, plastic spacers, and un-coated foam floats) and practices (such as on-site storage of tools and materials, on-site sorting of product between containers, and placement of loose shellfish on mudflats) should be specifically prohibited or limited. (c) This discussion should also evaluate means of establishing custody and responsibility for loose materials and debris – such as the use of operator-specific labels or tags on all equipment and gear. (d) In addition, please consider requiring lessees to contribute to a fund to cover the cost of frequent, independent, aquaculture debris survey and collection efforts to ensure that high debris risk materials, operations, and operators are recognized and addressed in a timely manner. CCC-24

Recreation

22. Please review the discussion in Section 5.3.8 to make sure it is relevant to recreation and expand it to include an evaluation of the proposed project's potential adverse effects to existing water-oriented recreational activities such as waterfowl hunting. CCC-25

Noise

23. The draft EIR limits its analysis of noise impacts to the use of internal combustion engines during culture activities. Please expand this analysis to include an evaluation of proposed pile driving activities and associated noise. This discussion should include details regarding the duration of pile driving, hours of operation, sound levels generated, and proximity to sensitive receptors. CCC-26

Aesthetic and Visual Resources

24. In combination with other proposed shellfish aquaculture development, the proposed project would result in a significant expansion of shellfish culture equipment in Arcata Bay over baseline conditions. (a) To allow for a complete evaluation of the potential CCC-27

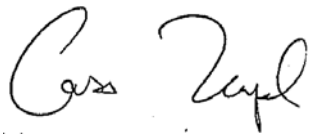
adverse impacts of this expansion, the aesthetic and visual resources discussions in both Section 5 and Section 6 of the EIR should be expanded to include visual simulations of the proposed aquaculture structures at low tide from a representative sample of public vantage points. (b) Under existing conditions, there is an abundance of stakes, markers, rafts, and other equipment visible from various public vantage points, including Highway 255 around Mad River Slough, the Manila area, Samoa Bridges, and the Eureka-Arcata Highway 101 corridor, which is a designated Coastal View Area under the Humboldt County LCP. The EIR should evaluate visual impact minimization measures such as alternative materials or practices that would be inconspicuous or less conspicuous from public vantage points (such as alternatives to or reduced use of white PVC pipes and stakes to demarcate growing areas). (c) In addition, the EIR should consider appropriate mitigation for any visual impacts that remain after application of such impact avoidance and minimization measures. Potential mitigation measures could include measures to restore or enhance visual quality in visually degraded areas of Arcata Bay. CCC-27

Alternatives

25. In addition to the various suggestions above to include a discussion of the alternatives that were considered for various specific project elements during development of the proposed project (for example, alternatives to the proposed use of industrial rubber bands to attach the culture bags to the racks), we also suggest expanding the consideration of overall project alternatives to address several of the potential environmental impacts that appear to have a higher likelihood and magnitude. Such alternatives should include (a) re-configuration of the lease sites to avoid all areas in which dense eelgrass has been mapped – including the approximately 48 acres mapped as dense eelgrass that is currently located within these sites; and (b) a mooring alternative that would avoid the proposed permanent placement of piles by pile driving. CCC-28

Thank you for your consideration of the comments included above. If you have any questions, please feel free to call me (415) 904-5502.

Sincerely,



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March 12, 2015

Mr. Jack Crider
Chief Executive Officer
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030
Eureka, CA 95502-1030
jcrider@humboldtbay.org

Subject: Draft EIR for the Humboldt Bay Mariculture Pre-Permitting Project (SCH#2013062068)

Dear Mr. Crider:

The California Department of Fish and Wildlife (Department) has reviewed the Draft Environmental Impact Report (DEIR) that describes the potential impacts of the Humboldt Bay Harbor, Recreation and Conservation District's (HBHD) Pre-permitting Mariculture Project (Project). The Project proposes to "pre-permit" new intertidal and subtidal leases for aquaculture purposes. The Project would cover a total of 527 acres of intertidal eelgrass and mudflat habitat, and 21 acres of subtidal eelgrass and mudflat habitat. The intertidal Project footprint consists of 67% (353.8 acres) of eelgrass habitat and 21% (114 acres) of mudflat habitat. The eelgrass habitat in the subtidal areas was not mapped or quantified in the DEIR. The Project also proposes to install up to 9 floating walkways, 72 Floating Upwelling Systems (FLUPSYs), and 30 culture rafts over three subtidal locations in central Humboldt Bay. In addition, the Project proposes to install 32 piles and up to 444 anchors to support the FLUPSYs, rafts, and walkways.

As a trustee for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection and management of fish, wildlife, and habitats necessary for biologically sustainable populations of those species (Fish and G. Code §1802). In this capacity, the Department administers the California Endangered Species Act (CESA), the Native Plant Protection Act, and other provisions of the California Fish and Game Code that afford protection to the State's fish and wildlife resources. The Department is also responsible for marine biodiversity protection under the Marine Life Protection Act (MLPA) in coastal marine waters of California and is recognized as a "Trustee Agency" under the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.; hereafter CEQA; Cal. Code Regs., § 15000 et seq.; hereafter CEQA Guidelines). As a Trustee Agency, the Department is responsible for providing biological expertise to review and comment upon environmental documents and impacts arising from Project activities (CEQA Guidelines, § 15386; Fish and G. Code, § 1802). In addition to our trustee role, the Department also encourages the conservation, maintenance, and utilization of the living resources of the state's waters for the benefit of all the citizens of the state, including the

DFW-1

development of commercial aquaculture (Fish and G. Code §1700). Pursuant to our jurisdiction, the Department has the following comments and recommendations regarding the Project. DFW-1

The Department reviewed the DEIR and is concerned the Project will have potentially significant impacts to Public Trust resources, including eelgrass and mudflat habitats, and species such as Pacific herring, shorebirds and waterfowl including black brant. The DEIR identified potentially significant impacts and proposed mitigation measures to reduce impacts to less than significant. However, the Department does not find the proposed mitigation measures adequate for bringing the potential impacts to a level of less than significant. In addition, the assessment of cumulative impacts was not adequately addressed and impacts are likely to be cumulatively considerable. The Department believes the final Environmental Impact Report (FEIR) should include requirements that will adequately avoid, minimize, or if necessary, mitigate significant impacts that have been identified in the DEIR and that are further discussed below. DFW-2

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. Eight sensitive species, including some listed as threatened or endangered pursuant to CESA or the federal Endangered Species Act (ESA), and California species of special concern (SSC) occur in the Project area. The Department designates certain species as SSC due to declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction. Species that occur in the Project area and are protected under the CESA and ESA, or are SSC, include: DFW-3

- Coho salmon, *Oncorhynchus kisutch*, State and federally-threatened (Southern Oregon/ Northern California 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 ESU);
- Eulachon, *Thaleichthys pacificus,* federally-threatened (southern distinct population segment (DPS));
- Green sturgeon, *Acipenser medirostris,* State SSC; federally-threatened (southern DPS);
- Longfin smelt, *Spirinchus thaleichthys*, State-threatened; and
- Black brant, *Branta bernicla nigricans*, State SSC.

Eelgrass

Seagrass habitats are highly productive nearshore ecosystems that provide a variety of valuable functions, including supporting commercial and recreational fisheries, nutrient

cycling and deposition of sediments (Barbier et al. 2011; Waycott et al. 2009). Eelgrass is a seagrass whose populations around the world have been in decline, with the disappearance of 29% of the known areal extent since 1879, and the rate of loss accelerating since 1990 (Waycott et al. 2009). The seagrasses, and the functions they provide, are threatened by a variety of impacts including aquaculture, coastal development, growing human populations, as well as by the impacts of climate change and ecological degradation (Bjork 2008; Orth et al. 2006; Waycott et al. 2009). Additionally, there is a growing body of evidence suggesting that seagrass beds, including eelgrass, and their associated sediments serve as globally important carbon sinks for atmospheric CO_2 (Duarte et al. 2005, Duarte et al. 2010, Fourqurean et al. 2012). DFW-3

Impacts to Eelgrass. Eelgrass is considered Essential Fish Habitat under the federal Magnuson-Stevens Fishery Conservation and Management Act, as well as a Habitat Area of Particular Concern by the Pacific Fishery Management Council. The mudflat habitats that support eelgrass are also considered Special Aquatic Sites under the 404(b)(1) guidelines of the Federal Clean Water Act. Eelgrass and intertidal mudflat habitats are further protected under Federal and State "no-net-loss" policies for wetland habitats. In line with the State policy, the Department recommends the proposed Project be revised to avoid and minimize impacts to eelgrass and mudflat habitats, and fully mitigate for any remaining impacts. Humboldt Bay holds approximately 37% of the known mapped eelgrass in the state (CDFW Marine Bios). This Project would impact 10% of the eelgrass in north Humboldt Bay, with existing and proposed projects cumulatively impacting 42% of the dense eelgrass in north Humboldt Bay. DFW-4

The DEIR states that impacts to eelgrass density and distribution will occur even with the mitigation measures described. The DEIR states impacts would occur from trampling, boat hull and propellers, changes in circulation patterns and sedimentation. To ensure no net loss, the Department recommends the FEIR include additional avoidance and minimization measures as well as require the development of a comprehensive monitoring and mitigation plan. This plan should include up front mitigation for any remaining impacts to eelgrass, and provide sufficient ongoing monitoring and plans for any additional mitigation needs for the life of the project. DFW-5

The Department recommends that prior to commencement of any Project activities, the HBHD form a jurisdictional marine habitat protection multi-agency working group to include the Coastal Commission, the Department, National Marine Fisheries Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the North Coast Regional Water Quality Control Board for review and endorsement of all marine habitat baseline surveys, impact analyses, appropriate monitoring and any compensation for impacts to sensitive marine habitats and species. Prior to commencement of Project activities, the HBHD shall provide to all applicable agencies any survey results, impact analyses, and monitoring and compensation protocols determined through the multi-agency process and required by jurisdictional agencies. DFW-6

Eelgrass Avoidance and Monitorning. The Project proposes to place aquaculture gear no closer than 1 meter from all eelgrass plants. To reduce the impact to eelgrass to a level of less than significant, the FEIR should include the following: DFW-7

- In line with the Department's recommendations to the Fish and Game Commission for aquaculture leases, increase the width of the buffer distance between all eelgrass plants and aquaculture gear to a minimum of 10 feet. DFW-7
- Aquaculture gear may only be placed in un-vegetated intertidal areas during the months of July and August, when eelgrass is at its maximum extent to ensure avoidance of eelgrass areas.
- Subtidal areas 1, 2 and 3 (identified in Section 2 of the DEIR) all include areas with eelgrass. To ensure no net loss, and to comply with the stated goal outlined in the DEIR to avoid all impacts to eelgrass, the equipment should be placed to ensure eelgrass is not impacted or shaded. Designs to avoid eelgrass should be submitted prior to implementation to the Department. These areas should also be included in the eelgrass monitoring and mitigation plan. DFW-8
- The Department recommends an annual report be provided describing eelgrass monitoring activities, and any additional required mitigation.

Invasive Eelgrass

The invasive eelgrass, *Zostera japonica*, is also found in Humboldt Bay. This species is likely to spread to additional areas due to trampling and boating activities that could break off intact turions for dispersal in new locations. An up to date map of *Zostera japonica* locations should be provided in the FEIR detailing the locations where it currently exists, along with best management practices that could reduce the potential spreading this plant to new locations (e.g. avoiding boating and traversing routs to aquaculture gear through areas with japonica). DFW-9

Black Brant

Black brant occur in Humboldt Bay as spring and fall migrant and winter visitors. Humboldt Bay is the fourth most utilized staging area in the Pacific Flyway for black brant, and has historically been the most important area in California for this species (Moore et al. 2004; Moore and Black 2006). Due in part to the health and size of eelgrass habitats found in the bay, Humboldt Bay provides the most important wintering and migration site in California for this species (Moffitt 1938; Pacific Flyway Council 2002). In spring 2001, it was estimated that Humboldt Bay held approximately 60% of the black brant population (Lee 2001). In addition to black brant, eelgrass has also been noted as the most important single food item to waterfowl that winter in Humboldt Bay (Yocum and Keller 1961). The reliance of brant on eelgrass makes them highly vulnerable to fluctuations in the quality of this habitat (Moore et al. 2004; Pacific Flyway Council 2002; Ward et al. 2005; Wilson and Atkinson 1995). DFW-10

While habitat loss has been identified as a major threat to brant populations (Shuford and Gardali 2008), a variety of human activities, including aquaculture, have the potential for physically degrading eelgrass habitats (Pacific Flyway Council 2002; Wilson and Atkinson 1995). Aquaculture has been noted as one the human activities with significant potential for degrading habitats important to black brant (Pacific Flyway

Council 2002). In addition, persistent human disturbance, such as occurs during aquaculture operations, is likely to reduce the amount of time black brant utilize Humboldt Bay, and prevent populations from returning to historical levels (Moore and Black 2006; Schmidt 1999). In north Humboldt Bay, Schmidt (1999) observed small boats associated with oyster operations disturbing brant "often", with brant being flushed with the first boat in the early mornings and not returning to feed until late evening. The DEIR states that an additional 15 small boats would be present in north Humboldt Bay due to the new leases. This Project could bring an additional 39 boat trips to north Humboldt Bay per week based on the estimates of the number of trips per week provided in the DEIR. With the observations from Schmidt (1999) and Murrell (1962) (as cited in Schmidt 1999); this consistent increase in boat traffic may substantially impact brant use of north Humboldt Bay, and could significantly impact the population of brant utilizing Humboldt Bay. DFW-10

The DEIR does not adequately address the potential impacts to black brant from Project activities with regard to disturbance. The FEIR should also provide a map of the gritting and loafing locations used by Brant in the North Bay along with an analysis of impacts to these locations. In addition, the DEIR does not list the black brant as a Species of Special Concern in section 5.5.3. To reduce the impacts to a level of less than significant, the Department recommends the FEIR include the following:

- Adopt the recommendations for avoiding, minimizing and mitigating for impacts to eelgrass habitats described above.
- Reduce the likelihood of disturbance to brant by substantially reducing the number of boat trips per week.

Mudflats

Intertidal mudflats provide habitat for fish such as longfin smelt, white and green sturgeon, elasmobranchs, shorebirds, and native invertebrates such as Dungeness crab. For example, bat rays consume clams, shrimp and polycheate worms all of which live buried in the mud (Grey et al. 1997; MacGinitie 1935; Matern et al. 2000; Talent 1982). A variety of shorebird species utilize Humboldt Bay mudflat habitats for feeding, resting and/or roosting (Colwell, 1994; Danufsky and Colwell 2003; Dodd and Colwell 1998; Evans and Harris 1994; Long and Ralph 2001). In addition, green and white sturgeon also forage on mudflat areas, feeding on the benthos consuming shrimp, clams, crabs, mollusks, amphipods, and small fish such as sand lances and Pacific herring (Dumbauld et al. 2008; Kelly et al. 2007; Moyle 2002). Commercially important species such as Dungeness crab utilize estuarine mudflat areas during certain stages of their lives and feed on small invertebrates. A state listed fish, the longfin smelt, resides in the lower half of the water column and feeds on benthic and pelagic invertebrates in subtidal channels as well as on intertidal mudflats and eelgrass beds (Blackmon et al. 2006; Chigbu and Sibley 1998; Feyrer et al. 2003; Hobbs et al. 2006; Moyle 2002). DFW-11

Large differences in species composition has been shown between bare mudflats and mudflats covered with aquaculture gear (Bouchet & Sauriau 2008; Castel et al. 1989; Dubois et al. 2007; Forrest & Creese 2006; Nugues 1996; and as reviewed in Forrest et

al. 2009). The presence of aquaculture gear has been shown to reduce current velocities, causing increased sedimentation and changes in the particle size of mudflat habitats (Bouchet & Sauriau 2008; DeGrave 1998; Forrest & Creese 2006; Nugues et al. 1996; and as reviewed in Forrest et al. 2009). Disturbance to mudflats from trampling as well as from vessel movements have been shown to cause changes in the species composition of benthic infauna (DeGrave et al. 1998; Forrest & Creese 2006). These alterations of the physical habitat result in changes to the species composition that utilize these habitats (Bouchet & Sauriau 2008; Castel et al. 1989; Dubois et al. 2007; Forrest & Creese 2006; Nugues 1996; and as reviewed in Forrest et al. 2009). Also, cultured oysters have also been shown to be direct trophic competitors of other filter feeders causing trophic shifts and an altered species composition (Leguerrier et al 2004). These large scale changes in species composition are also likely to impact the species that utilize these habitats for feeding. DFW-11

Mudflat Avoidance and Monitoring. To reduce the impact to mudflats to a level of less than significant, the Department recommends the FEIR include the following:

- The DEIR states that a maximum of 1.43 acres of mudflats could be impacted from placement of posts and anchors. Intertidal mudflats are protected under the State's 'no-net-loss' for wetlands policy and all impacts must be avoided, minimized and mitigated, with mitigation occurring prior to the implementation of the Project.
- Aquaculture gear, trampling and vessel traffic have been shown to significantly alter mudflat habitats. As wetland habitats are protected for no net loss of habitat and habitat values, these impacts must also be avoided, minimized and mitigated, with mitigation occurring prior to the implementation of the Project.
- Reduce impacts to fish and wildlife that feed on mudflat habitats to a level of less than significant by minimizing the Project footprint and placing aquaculture gear in a manner that will avoid and minimize impacts.

Shorebirds

Humboldt Bay is an internationally important site for overwintering and seasonally migrating shorebirds (Colwell 1994; Hickey et al. 2003; Page et al. 1999). Depending on the season, up to 100,000 shorebirds reside in Humboldt Bay, with the Bay listed as an Important Bird Area (IBA) by the Audubon Society and an International Site in the Western Hemisphere Shorebird Reserve Network (Colwell 1994; Schlosser and Eicher 2012). At least 24 species of shorebirds including American avocets, sandpipers, dowitchers, plovers, godwits and dunlin utilize Humboldt Bay mudflat habitats for feeding, resting and/or roosting (Colwell, 1994; Danufsky and Colwell 2003; Dodd and Colwell 1998; Evans and Harris 1994; Long and Ralph 2001). Of these shorebirds, two thirds are listed as shorebirds of concern, or are on the US Fish and Wildlife Service's Birds of Conservation Concern list (US Fish and Wildlife Service 2008; U.S. Shorebird Conservation Plan Partnership 2015). Various species of shorebirds utilize the many habitats available in the bay. Human disturbance and habitat destruction, specifically from oyster and shellfish farming, have been noted to have impacts to shorebird populations (Kelly et al. 1996; Pierce and Kerr 2004). Further, oyster and shellfish farming has been identified as a conservation issue for shorebirds in Humboldt Bay, and DFW-12

the restriction of further alteration of mudflats for oyster culture has been identified as a priority shorebird conservation goal for Humboldt Bay (Hickey et al. 2003). However, observations in the field have shown several bird species demonstrated some foraging preference to long line oyster culture (Connolly and Colwell 2005; Hickey et al. 2003). The impacts to shorebirds through increased disturbance and habitat modification and loss may be significant, and the Department recommends avoidance, minimization and mitigation measures be developed to reduce the impacts to less than significant. DFW-12

Subtidal Habitat

The Project proposes to install up to 9 floating walkways, 72 FLUPSYs, and 30 culture rafts over three subtidal locations in central Humboldt Bay. These structures are estimated to cover 3.7 acres of water, in addition to the already existing docks and aquaculture rafts in north and central Humboldt Bay. The Project also proposes to install 32 piles that would remove 0.042 acres of subtidal habitat, as well as install up to 444 anchors that would impact a minimum of 0.05 acres of subtidal habitat. These impacts, in addition to the proposed intertidal impacts, are potentially going to have a considerable cumulative impact. The Department recommends that avoidance, minimization and mitigation measures be developed to reduce the impacts to less than significant. DFW-13

Overwater Structures

Many fish depend upon sight for feeding, prey capture and schooling. Sight is also important for spatial orientation, predator avoidance and migration. Overwater structures can create underwater light contrasts by casting shadows and creating shade. Changes to ambient underwater light environments pose a risk of altering fish migration behavior and increasing mortality risks (as reviewed in: Nightingale and Simenstad 2001). Pinnix (et al. 2013) noted that migrating coho salmon smolts utilized the channel margins of central Humboldt Bay, but were rarely found near pilings or docks. This is similar to other studies that have demonstrated varied responses to overwater structures with some individuals passing under structures, some pausing and going around, schools breaking up upon encountering overwater structures, and some pausing and eventually going under (Heiser and Finn 1970; Pentec 1997; Toft et al. 2007; Weitkamp 1982). DFW-14

As the subtidal portion of the Project is located between the streams utilized by all of the listed anadromous species in Humboldt Bay and the open ocean, this portion of the Project could potentially impact coho salmon, longfin smelt, chinook salmon, steelhead and eulachon. These species are likely to be subjected to significant ongoing impacts due to Project structures, such as increased predation risk and impacts to migration, as well as impacts from night time lighting and maintenance activities. The Department recommends reducing the footprint of overwater structures to reduce the impacts to less than significant.

Longfin Smelt

Longfin smelt are listed as a threatened species in California and have been found throughout north Humboldt Bay, and as recently as December 2014, in the area off DFW-15

Indian Island (James Ray, CDFW, per. comm., December 2014; Sopher 1974; Pinnix et al. 2005; DeGeorges 1972; Chamberlain 1988; Wallace, CDFW, per. comm., December 2014). Longfin smelt feed on small invertebrates that can be found in large numbers in eelgrass and mudflat habitats including copepods, gammarid amphipods and cumaceans (Feyrer et al. 2003; Hobbs et al. 2006; Moyle 2002). Large increases in non-native filter feeders have been shown to divert, "energy and nutrient flow from the primary consumers that longfin smelt eat" (as cited in Rosenfield and Baxter 2007; see also: Alpine and Cloern 1992; Feyrer 2003; Hobbs et al. 2006; Kimmerer 2002). This type of food shortage and fish species impact may occur given the size of the proposed Project expansion and has the potential to cause a significant impact. DFW-15

Carrying Capacity

The DEIR includes an analysis of carrying capacity based on the model used by Gibbs (2007) (DEIR Appendix C). Gibbs (2007) utilizes three 'performance' indicators including the clearance efficiency (CE) to determine the level of interaction between abundance of cultured species and the water column environment. The CE is the ratio between the number of days the water takes to clear an estuary and the number of days it would take for cultured filter feeders to process all the water in the estuary (Gallardi 201 4). Gibbs (2007) states that a CE of <0.05 would not induce significant impacts, while a value of 1.0 or greater indicates that filtering rates are greater than can be replenished by flushing. While the DEIR does not set a threshold level for significance, the reported estimated values for CE are 0.105 for existing aquaculture Projects. This estimate suggests that >10% of the available daily average phytoplankton is already being consumed by current aquaculture activities. The CE estimate is 1.324 for all projects, which is 132% of the available daily average phytoplankton is being filtered by culture. While a threshold for this indicator was not established in the DEIR, the information provided in the analysis as currently calculated suggests the proposed increase in shellfish culture could greatly reduce available food resources to native filter feeding invertebrates in the Bay. DFW-16

In addition, there are concerns with how the model was run. The analysis utilized the total annual production of phytoplankton estimated for North Bay and calculated an average daily rate. Utilizing this number can potentially overestimate the amount of phytoplankton available in North Bay during times when phytoplankton levels are at their lowest. These times of phytoplankton minima are when non-cultured filter feeders are most vulnerable to loss of food by cultured animals. The Department recommends the model be re-run utilizing a value of phytoplankton abundance calculated by taking the "7 day average" of phytoplankton minima over a 10 year period in Humboldt Bay. This will provide a more useful estimate of the potential impacts of the Project on carrying capacity of the Bay. DFW-17

The Department also recommends the analysis include estimates of how carrying capacity is predicted to change as a result of climate change, including an estimate of error for the performance indicators provided, and include thresholds for significance for all the performance indicators reported. DFW-18

Artificial Lighting

The DEIR does not include a description of night time operations on mudflats in the Project description. As shorebirds are known to utilize intertidal areas at night, any night time operations will further increase the already significant impacts to shorebirds utilizing Humboldt Bay (Dodd and Colwell 1996; Conklin et al. 2007). Use of headlamps, flashlights, and navigational lights on vessels is discussed in IMPACT AV-3. This section states the impact is, "considered less than significant with mitigation". However, no mitigation for the impact from night time operations on intertidal areas is proposed in the DEIR. The Department recommends the FEIR include sufficient mitigation to reduce the impact to less than significant. DFW-19

Sedimentation

A variety of studies have reported deposition of sediments in areas with aquaculture gear (Rumrill & Poulton 2004; Forrest & Creese 2006; and as reviewed in Forrest et al. 2009). The report noted sediment deposition in areas with long lines, with deposition rates increasing as the spacing between long lines decreased. Changes in sedimentation as compared to uncultured areas are readily apparent when observing cultured areas in Humboldt Bay. Further studies are needed to quantify this impact to ensure levels are less than significant. The Department recommends the FEIR reflect the need for such studies. DFW-20

Macroalgae

The Project proposes to harvest macroalgae plants from areas outside Humboldt Bay and grow them on long lines in subtidal areas for commercial harvest. The DEIR does not state where the culture would take place, in subtidal areas of North Bay, or in the subtidal areas of Central Bay where the rafts and FLUPSYs are to be located. The Department recommends this type of aquaculture be placed in Central Bay, and not in the channels of North Bay. Also, the DEIR states that algae would be collected from drift or by trimming algae plants and attaching them to longlines for culture. No aquatic plants may be collected from uncultured areas for commercial purposes except under a license issued by the Department. DFW-21

Reasonably Foreseeable Probable Future Projects

CEQA Guidelines state that all reasonably foreseeable probable future projects should be included in the evaluation of cumulative impacts (CEQA Guidelines § 15355). The FEIR should include all existing proposed projects that include aquaculture expansion in Humboldt Bay. In addition, the DEIR states that existing buildings, docks etc. are expected to be used as result of this Project (DEIR Section 5.10). However, the DEIR does not identify which existing buildings, docks etc. could be utilized due to this Project. The Department recommends the FEIR include a list and map showing where the existing underutilized infrastructure is located, and include and evaluate the environmental impacts from any needed upgrades or modifications to the existing infrastructure to accommodate needed upland facilities. DFW-22

Cumulative Impacts

There are currently approximately 400 acres of intertidal aquaculture (from all sources) in Humboldt Bay and an additional 622 acres being proposed from the Coast Seafoods Expansion Project (in addition to the 521 proposed as part of the Project). Cumulatively these Projects would increase the number of acres used for aquaculture purposes in Humboldt Bay by 384% to approximately 1,530 acres. While the Project individually is expected to result in significant unavoidable impacts to the environment, the cumulative impacts from both proposed projects need to be more thoroughly evaluated. For example, currently 7.25% of the area between -0.5m and +0.5m (MLLW) has aquaculture gear (NOAA Coastal LiDAR data, 2012). Given both expansion projects, this percentage would increase to 31%. As identified above, this is likely to have a significant impact on species such as shorebirds, sturgeon and longfin smelt who move with the tide to feed in mudflat habitats (Dodd & Colwell 1996; Dumbauld et al. 2008; Moyle 2002). DFW-23

Conclusion

The Department appreciates the opportunity to review and comment on the DEIR. As always, Department personnel are available to discuss our comments and recommendations in greater detail. For further information, please contact Rebecca Garwood, Environmental Scientist, California Department of Fish and Wildlife, 619 2nd Street, Eureka, California, 95501, phone (707) 445-6456, and email Rebecca.Garwood@wildlife.ca.gov. DFW-24

Sincerely,

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Adam Wagschal

From: Jack Crider <jcrider@humboldtbay.org>
Sent: Thursday, March 12, 2015 3:44 PM
To: awagschal@humboldtbay.org
Subject: FW: DEIR for the Humboldt Bay Mariculture Pre-Permitting Project

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From: Kristen Goetz [mailto:kgoetz@ci.eureka.ca.gov]
Sent: Thursday, March 12, 2015 2:18 PM
To: 'jcrider@humboldtbay.org'
Cc: Rob Holmlund; Robert Jensen; Lisa Savage
Subject: DEIR for the Humboldt Bay Mariculture Pre-Permitting Project

Dear Jack:

Thank you for the opportunity to review the Draft EIR for the above project. The City of Eureka does not have any comments.

We look forward to working with you during the future Use Permit process. CE-1

Please feel free to contact me if you have any questions.

Kristen M. Goetz | Senior Planner
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Mr. George Williamson, AICP

Humboldt Bay Harbor Recreation and Conservation District (HBHRCD)

P. O. Box 1030/ 601 Startare Dr.

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March 12, 2015

Dear Mr. Williamson:

The following comments are provided as part of the HBHRCD scoping process for the Mariculture Pre-permitting Project DEIR.

As the HBHRCD is already aware, Humboldt Bay is a natural resource of International significance. The Bay wetlands provide vital winter waterfowl habitat values that cannot be replaced. Migratory birds use Humboldt Bay tidelands year round. Frazer-1

I believe that your DEIR should commit to long term monitoring of Pacific Black brandt and other migratory bird use. Avian monitoring should be conducted prior to issuing any new permits, or allowing expansion of any existing operations as baseline data for comparison to any changes after new expanded permits that may be issued. Post project avian monitoring should be required and paid for as a condition of issuing any new Mariculture permits. I suggest that future HBHRCD permits should have a process to revoke or modify permitted operations if adverse impacts are documented by future monitoring. Frazer-2

The Pre-permitting project is not well described in the scoping meeting announcement as it relates to other existing, on-going oyster production operations and the separate permitting effort to expand the "Coast" shellfish company operations. The "Coast Seafoods Co." proposal is likely to have adverse impacts to eelgrass and resulting migratory bird use. I take exception to the claim that the significance can be reduced to "less than Significant with mitigations", based on statements contained in the Jan. 20, 2015 "Initial Study" see page 29. Your project should address both the existing operations along with the cumulative impacts of any additional permits that may be issued under the DEIR pre-permitting project or separately issued permits under the HBHRCD jurisdiction. Frazer-3

I request that your DEIR address the maximum development potential of Mariculture in Humboldt Bay. I encourage HBHRCD to consider leaving a margin for error and adjustment for any changes due to uncertain future conditions. For example if sea level rise impacts the locations and extent of eelgrass and other tidal wetland habitats, will wildlife and plant resources have adequate room to adjust to future changing water depths? Frazer-4

Public recreational use and navigation in small water craft may be impacted by some of the rack style or line and pole installations used by oyster farmers. As our human population grows, one can only assume the desire to use recreational boats on Humboldt Bay will continue to increase. Boating on Frazer-5

Humboldt Bay is inherently hazardous and the proposed expansion of mariculture should not be permitted in a way that increases the risk to recreational boat users, including very shallow draft boats and kayaks that use the tidal water areas in the Bay. Frazer-5

Thank you for the opportunity to comment on the Pre-permitting project DEIR. I appreciate your consideration and the open fashion in which the March 4, 2015 Scoping meeting was held.

Sincerely,

Scott E. Frazer

P.O. Box 203

Blue Lake, CA 95525

Humboldt Bay Harbor, Recreation and Conservation District, February 12, 2015
P.O. Box 1030
Eureka, CA 95502-1030.
Jack Crider, Executive Director

Steven Grantham
P.O. Box 645
Bayside, CA
95524

Subject: Comments on Draft Environmental Impact Report for the Humboldt Bay Mariculture Pre-Permitting Project SCH #2013062068, Arcata Bay, California, **and** Initial Study Prepared Pursuant to the California Environmental Quality Act, for Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project, Arcata Bay, California.

Grantham - 1

Dear Mr. Crider;

I have reviewed the subject documents and offer the following observations, objections, and suggestions. It is my observation that both draft Environmental Impact Report and Initial Study are insufficient for a lack of analysis on potential impacts of the projects on recreational waterfowl hunting in the proposed permit areas. I object that effects to recreation were not analyzed, and I suggest that effects of permitting the project could be cumulative and potentially significant on recreational uses, particularly waterfowl hunting and that impacts from the proposed project should be fully analyzed and mitigated for this public use.

Humboldt Bay, both South Bay and Arcata Bay have a long history of providing world-class recreational waterfowl hunting. So much so that a watercraft tradition developed for the hunting of waterfowl that is distinctively Humboldt in character. Scull boat design, manufacture, and use were and are distinctive to the Bay's waters. Humboldt Bay scull boats are recognized statewide and nationally. So distinctive is the tradition and method of waterfowl hunting this Bay, that the Fish and Game Code 3681 applies only to the uniqueness of the location and in part the method. The code section applies to the whole of Humboldt Bay and indicates what days can or cannot be hunted from a scull boat. It specifies that:

"In Districts 8 and 9, it is unlawful to take ducks or geese in any manner below the incoming or outgoing tidewater's edge or from any blind, boat, floating device, island, islet, or exposed tidal flat except on Saturdays, Sundays, Wednesdays, holidays and the opening and closing days during the prescribed open season except that the use of boats is permitted to retrieve crippled or dead birds."

The code's verbiage may not be central to the argument here, but the point that the locally distinctive language is codified speaks to the depth of and perhaps recognition of

a local recreational tradition. Further, public trust doctrine holds that the Bays navigable waterways and submerged lands, that are not in a proprietary capacity, but rather "as trustee of a public trust for the benefit of the people" remain useful for navigation, fishing, and by extension, hunting.

Grantham - 1

Specific locations in the proposed pre-permitting and permit renewal projects are located squarely in areas that are significantly important to migratory waterfowl. Large rafts of waterfowl; widgeon, pintail, greenwing teal, and brant loaf and feed in the shallow waters over the mudflats and eel grass beds off of Jacoby Creek, Brainard, Bracut, and Manila. And in certain years, when drought strikes the Central Valley and the Klamath Basin, the numbers swell to levels that are awe-inspiring. Literally tens of thousands of puddle ducks loaf and roost in Arcata Bay's shallows. When rafts of waterfowl congregate, and they are legally accessible, they are hunted by scull boaters on codified days. These shallow waters that submerge the Jacoby Creek, Brainard, Bracut, and Manila mudflats have for over a century attracted the likes of many a sculler and historic scull boat names; Dean (Street named in Manila), Dolmeyer, Delatchmut(sp.?), Burdick, and Nellis for example fill the local nomenclature.

Without a doubt the permitting of a larger footprint on Arcata Bay's shallows would significantly impact the recreational waterfowling tradition firmly established here. The effects of increased oyster farming are already troublesome and create safety concerns and concerns for the health of the waterfowl that depend on Arcata Bay's shallows, mudflats, and eel grass beds. Impacts of an increased oyster farming foot print center on hunter safety, interference by oyster boat crews with active hunting, and disruption of waterfowl habitat and behavior.

Concerns surrounding the oyster gear and boaters safety cannot be overlooked in an analysis of effects of the proposed project as scullers can unwittingly become tangled, or worse yet suffer boat damage resulting in potentially catastrophic consequences. When waterfowling in a scull boat the weather can turn and a sculler that depends on rowing can be swept into oyster gear with dangerous consequences.

Waterfowl already shy away from the oyster gear and working boats. Their behavior is altered and locations that provide loafing, feeding, gritting, become inaccessible. I have observed first hand birds being flushed by oyster boats, which had an effect on legal hunts, or more importantly interfered with, perhaps illegally.

Language in the Public Resources Code in the 5900 sections recognizes the importance of recreation uses in the public domain. Recreation is referred to as a public interest, that is necessary, and that there are opportunities in them for the people of California. The project area is just such a place for these opportunities. Not considering recreational use, in the case here waterfowling on Arcata Bay, short-changes the process.

I suggest that an analysis be conducted by the permittee that establishes the importance of waterfowl use and waterfowling on locations in the permitted area. The draft document would benefit from this analysis and ideally would identify means of mitigating the

impacts the permitted activity undeniably has and would continue to have on legal recreational waterfowl hunting in Arcata Bay.

Grantham - 1

Thank you taking the time to consider my concerns. I look forward discussing this with you. I can be reached at tulecruncher@yahoo.com or 707-845-4058.

Sincerely,

Steven Grantham

Cc: DFW, CCC, CALWaterfowl.

HOG
ISLAND
OYSTER
CO.
NAPA
MARSHALL
SAN FRANCISCO

March 13, 2015

Jack Crider
Adam Wagschal
Humboldt Bay Harbor, Recreation, and Conservation District
601 Startare Drive
Eureka, CA 95501

Dear Mr. Crider and Mr. Wagschal,

This letter is submitted on behalf of Hog Island Oyster Company ("HIOC") in response to the Humboldt Bay Mariculture Pre-Permitting Project Draft Environmental Impact Report ("EIR"). HIOC strongly supports the Humboldt Bay Harbor, Recreation, and Conservation District's ("District") efforts to expand shellfish aquaculture in Humboldt Bay, using an innovative approach that reduces permitting and transactional costs associated with approving new shellfish farms, thereby permitting small shellfish companies to start farms in Humboldt Bay and further strengthening a key local industry. HIOC - 1

While we believe that the EIR does a very good job of describing the environmental impacts and identifying appropriate mitigation measures, HIOC strongly disagrees with the District's proposed Mitigation Measure BIO-9, imposing a prohibition on cultivation of Manila clams to maturity.

A. The EIR Admits the Mitigation Measure Is Not Needed to Mitigate for any Adverse Environmental Impact HIOC - 2

Mitigation Measure BIO-9 requires removal of "mature clams from bay. All clam seed will be removed from Humboldt Bay prior to reaching 12 mm shell size, at which size they are not yet sexually mature." Mitigation measures are not required for environmental effects that are found to not be significant. 14 Cal. Code Regs. § 15126.4. As noted in the EIR, Manila clams have been naturalized in Humboldt Bay for decades without evidence of propagation in the Bay with adverse impacts to other species. EIR, at 62-63. Based on this statement alone, this mitigation measure should be excluded as extraneous and unnecessary.[1]

[1] HIOC acknowledges that a similar condition was imposed by the California Coastal Commission ("CCC") on its recent FLUPSY permit, as well as a similar permit for Taylor Mariculture. However, in communications with the CCC, staff acknowledged that the condition imposed did not create a hard precedent and that every project would be analyzed on a case-by-case basis. Based on that representation, HIOC did not object to the condition at that time, as they would be removing the clams from its FLUPSYs prior to maturity.

20215 SHORELINE HWY PO BOX 829 MARSHALL, CA 94940 PHONE 415 663 9218 FAX 415 663 9246

B. There is No Evidence that Manila Clams are an Invasive Species that Justifies the Proposed Prohibition

Manila clams have, and continue to be, cultivated in Humboldt Bay, with no evidence that they are an invasive species that adversely affects the surrounding environment or native species. Indeed, Manila clams have been successfully cultivated in California for decades and the California Department of Fish and Wildlife ("CA DFW") routinely issues stocking permits to growers for the cultivation of Manila clams. This is consistent with other Western states, such as Washington State, which has a robust and expanding Manila clam industry. Several growers in Humboldt Bay have been issued stocking permits for Manila clams, with little or no opposition or stated concern. As the entity primarily responsible for management and protection of the State's wildlife and species, the District should defer to CA DFW's judgment that Manila clams are an introduced, but not invasive, species that may be successfully cultivated in Humboldt Bay. HIOC - 2

Manila clams meet the definition of an introduced, as opposed to invasive, species. This distinction is vitally important to determining which species are subject to regulatory restriction. A number of species (Pacific oysters, palm trees, Jersey cows, etc.) are introduced species not native to the State. They are only subject to additional regulation and restrictions if they display invasive characteristics that are adverse to the surrounding environment.

The federal government uses clear definitions of "introduced" and "invasive" species. Executive Order 13112, which regulates invasive species, defines "alien species" as "any species, including its seeds, eggs, spores, or other biological material capable of promulgating that species, that is not native to that ecosystem."[2] This is contrasted with "invasive species", which is defined as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health."[3] Only invasive species are subject to regulation. In evaluating the Executive Order's definitions to provide further clarification, the National Invasive Species Council found that for "a non-native organism to be considered an *invasive species* in the policy context, the negative effects that the organism causes or is likely to cause are deemed to outweigh any beneficial effects."[4]

The EIR provides no evidence supporting a claim that Manila clams have adverse invasive characteristics; as noted above, it states the opposite. This conclusion is further supported by the recent determination from NOAA Sanctuaries that continued cultivation of nonnative species in Tomales Bay (including Manila clams) "is acceptable and will not adversely harm sanctuary resources."[5] Given this background, the District should permit the cultivation of Manila clams, consistent with the NOAA Marine Aquaculture Policy, which permits cultivation of nonnative species that have been scientifically shown to "not cause undue harm to wild species, habitats, or ecosystems, in the event of escape."[6]

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[2] Executive Order 13112, February 3, 1999, § 1.

[3] *Id.*

[4] Invasive Species Advisory Committee, National Invasive Species Council, "Invasive Species Definition Clarification and Guidance White Paper," 4/27/06, at 3.

[5] 78 Federal Register at 16625.

[6] NOAA Marine Aquaculture Policy, June 2011, at 9.

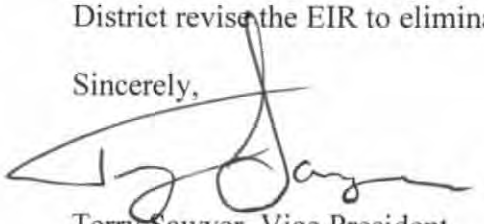
C. The Mitigation Measure Could Significantly Impact Future Expansion of Aquaculture in Humboldt Bay

It is extremely difficult to predict how seafood markets will develop and change. For example, no one in the industry (or state regulatory agencies) would have predicted twenty years ago that burgeoning geoduck demand in China would create a market resulting in the exponential expansion of the geoduck industry in Washington and Alaska. Eliminating potential species for cultivation, based on speculative impacts not supported by other state and federal agencies, is short-sighted and can impede the District's goals of creating a diverse shellfish industry in Humboldt Bay that can respond to market demand; generate sustainable, living-wage jobs; and further establish Humboldt Bay one of the premiere sources of shellfish in the country. HIOC - 2

D. Conclusion

HIOC strongly supports the District's efforts to promote the reasonable and sustainable expansion of shellfish aquaculture in Humboldt Bay. Overall, the EIR is well-written and provides a strong environmental analysis with reasonable mitigation measures. The only exception to this is Mitigation Measure BIO-9, which is unsupported by the EIR's analysis, scientific and empirical support, or regulatory precedent. Therefore, HIOC requests that the District revise the EIR to eliminate BIO-9. Thank you for your time and consideration.

Sincerely,



Terry Sawyer, Vice President
Hog Island Oyster Company, Inc.

Adam Wagschal

From: Humboldt Bay Harbor District <jlee@humboldt1.com>
Sent: Thursday, February 26, 2015 7:36 PM
To: kfarrell@humboldtbay.org
Subject: Form submission from: Contact

Submitted on Thursday, February 26, 2015 - 7:36pm Submitted by anonymous user: [64.50.180.137] Submitted values are:

Your Name: Jon Lee
Email Address: jlee@humboldt1.com
Phone Number:
Questions / Comments:
I'm not sure who to send a comment on Coast Seafoods draft oyster expansion
but:

Has there been a study done on how an expanded oyster population, and the high amount of nutrients this will remove from the water, will affect the native invertebrate community - and all of the vertebrates that feed on them?
Has anyone even thought about this as I don't see it addressed in the DRAFT?

Thanks

Lee -1

The results of this submission may be viewed at:
http://humboldtbay.org/node/5/submission/278

Pacific Outfitters

955 North State Street
Ukiah, California, 95482
Ph: 707 - 468 - 6474
Fx: 707 - 468 - 7405

1600 Fifth Street
Eureka, California, 95501
Ph: 707 - 443 - 6328
Fx: 707 - 443 - 1002

737 "G" Street
Arcata, California, 95521
Ph: 707 - 822 - 0321
Fx: 707 - 822 - 0374

Bradley K. Smith, Owner
Pacific Outfitters, Adventures
1535 Sixth Street
Eureka, CA 95501

March 10, 2015

Mr. Jack Crider, Executive Director
Humboldt Bay Harbor and Recreation District
P.O. Box 1030
Eureka, CA 95502-1030

Lee -1

Dear Sir,

I am a licensed hunting guide and a Sporting Goods Retailer. I have been guiding hunters for waterfowl in this area for more than twenty years. I have been selling equipment to sportsmen for more than forty years. I have considerable practical field experience with Black Brant. I have what I consider to be serious concerns over expanding the oyster beds in Northern Humboldt Bay.

Black Brant were on their way to extinction years ago because their habitat was being overused by other species, humans included. This included their nesting grounds and their migratory route. The hunting community was the first to recognize this problem. They acted by restricting the hunting season, and by creating the South Bay Wildlife Refuge. Hunters recognize that habitat is the most important factor in a species survival.

Black Brant migrate from the Alaska to Mexico and back again. They depend on eel grass for food along this migratory route. They also depend on a place to rest during this long distance migration. Humboldt Bay is a major feeding and resting area along their migration route. Humboldt Bay has become critical to Black Brant because the few other feeding and resting areas have been environmentally degraded. PO-1

The Black Brant population is currently stable and appears to be healthy. I would expect it to remain so unless their habitat is degraded further. My opinion is that any expansion of human activity into or upon the sandy mud flats of any part of Humboldt Bay would degrade the habitat sufficiently to affect the Black Brant Population. We must protect our natural resources.

Economically, Black Brant draw hunters from all over the United States. My client list includes hunters from Pennsylvania, North Dakota, Florida, Maryland, New Jersey, Idaho. They stay in hotels, buy equipment, eat food, and add significantly to our economy. They take no more than two birds each. That means that each and every Black Brant has a significant economic impact on this area. My opinion is that any reduction in the Black Brant population has a serious economic consequence.

Sincerely,

Bradley K. Smith

Adam Wagschal

From: Tom peters <tpete@reninet.com>
Sent: Wednesday, March 11, 2015 3:40 PM
To: Clerk@humboldtbay.org
Cc: 'Jeff Todoroff'
Subject: oyster bed expansion

I claim no expertise in growing oysters. However I was involved in a small oyster growing operation with Jeff Huffman several years ago (Golden Pacific). I am also a former commercial herring fisherman both in Humboldt Bay and in San Francisco Bay.
Currently I fish extensively for California halibut in the North Bay and am at least somewhat familiar with its waters. Peters -1

In scanning the DEIR for this proposed tidelands lease expansion, it appears to be very biased towards the project. Little consideration is made for the positive effects of, instead of expanding oyster culture, making efforts be to expand productive tidelands instead.
Only about 10% of historical tidelands remain after many years of 'projects'. Of the remaining 9000 acres of saltwater tideland remaining, this project seeks to impact over 15% of them. Even if the impact was light, the cumulative effect could be significant.
Perhaps any expansion of operations should be dependent on reclaiming productive tidal marshes and wetlands, opening long-closed waters to the salt. Peters -2

The long list of possible impacts and needed mitigation in the DEIR largely dismisses most of them with little or no discussion. There are a number of areas that could and probably will impact the bay but are not considered. I am sorry I came to this discussion too late to go into great detail but do certainly hope that the Harbor Commissioners are knowledgeable enough to understand this problem. Please do not get stars in your eyes and lunge into another ill-considered project which, while it might benefit several businesses, does not benefit the bay and those of us who use it for non-commercial purposes. Peters -3

I know that the effect of oyster culture is relatively light due to the occasional nature of on-the-ground activity on the beds. I also know from direct observation, that when that activity does occur, it can be quite disruptive, stirring up mud and releasing large quantities of eelgrass.
I can see from the schedule that activity is highest right during the feeding and migration times for Black Brant. Even if the activity had minimal impact on the eelgrass (disputable), it could certainly have an impact of the feeding habits of the birds. These Brant are totally dependent on Humboldt Bay eelgrass for fueling their migrations up and down the coast. There simply is no other place for them to feed for many hundreds of miles in either direction. Human activity could easily force them to less productive areas. Peters -4

Spring is also when newly hatched herring are seeking shelter in the eelgrass beds. Disruption can only have a negative effect on these tiny fish. Herring production has seen a large decrease in recent years, partially due to poor years in eelgrass production. Any decrease reverberates throughout the aquatic food chain.

The vast majority of fish and organisms in the North Bay depend, ultimately, on phytoplankton for food. A large increase in oyster production will remove (filter) more of the phytoplankton resource from the waters of the bay.
It would be reasonable to surmise that this will have an effect on ALL the other creatures in the bay, as well. They all share a finite food resource. Peters -5

While I believe the current oyster production does reduce the availability of phytoplankton and the present levels of disruption already have the effect of reducing other species in the bay, I also believe that there exists a workable

equilibrium, or tradeoff, between oyster production and the general productivity of the bay waters. However**, I would NOT accept an increase in oyster production at the expense of the other resources and organisms that share the bay.**

Peters -5

My greatest concern is that INCREASING oyster production and tidewater disruption could ultimately DECREASE the general productivity of the entire system. It is a finite resource and cannot sustain growth beyond a certain point. Is the Harbor District CERTAIN that this point has not been reached? I am not.
I believe the production of shellfish is at or near its limit if the general health of the bay is to be considered.

I have no animosity toward Coast Oyster or any of the other companies involved. In fact, it appears that they have become much better stewards of their current operations, far better than past operations that 'paved' the bay floor with shells and trawled the channels for bat-rays..
That said, my experience with the North Bay suggests that any significant increase in production and disruptive activities will come with too great a cost to the health of the entire bay ecosystem.

Peters -6

It might be possible to minimize the leases to allow only the very least disruptive portions such as the sub-tidal operations. They might still have an impact but it would be the least possible while allowing an increase in business.

While I could possibly accept a very much smaller project that concentrates production and minimizes area-wide disruption, **I am OPPOSED to the current lease expansion proposal.**

Thank you for taking my comments.
Thomas H. Peters
221 Dollison St.
Eureka, CA 95501
707-445-1666
tpete@reninet.com

Adam Wagschal

From: HBHRC Clerk <clerk@humboldtbay.org>
Sent: Thursday, March 12, 2015 2:05 PM
To: 'Patti Tyson'; 'Adam Wagschal'
Subject: FW: Draft Environmental Impact Report For The Humboldt Bay Mariculture Pre Permitting Project

Forwarding public comment

From: Ted Romo [mailto:blackbrantsky@yahoo.com]
Sent: Thursday, March 12, 2015 12:43 PM
To: Clerk@humboldtbay.org
Subject: Draft Environmental Impact Report For The Humboldt Bay Mariculture Pre Permitting Project

Mr. Jack Crider,

As a past stakeholder who helped put together the Humboldt Harbor Recreation and Conservation District Management Plan, the way I remember serving was that input was from many different stakeholders who use the bay and not just a few individuals. It seems to me that your DEIR, as written, seems to look like it conflicts with the intent of directions in your management plan. I'd like to suggest that maybe you again create a body of stakeholders that meet the 3 to 5 year review cycle, to help you identify how to reestablish your objectives of being consistent with your directions, and I am willing to work with the Harbor District again in the position of a stakeholder who uses the bay.

Romo - 1

Thank you
Ted Romo
3419 Edgewood Rd
Eureka, California

State of California—Health and Human Services Agency
California Department of Public Health

MICHAEL WILKENING
Acting Director

EDMUND G. BROWN JR.
Governor

March 11, 2015

Mr. Jack Crider
Chief Executive Officer
Humboldt Bay Harbor, Recreation
and Conservation District
P.O. Box 1030
601 Startare Drive
Eureka, CA 95502-1030

RE: Humboldt Bay Mariculture Pre-Permitting Project Draft EIR

The California Department of Public Health (CDPH) is the lead agency in the State shellfish sanitation program, which certifies and regulates sanitary procedures followed in the growing, harvesting, handling, processing, storage and distribution of bivalve molluscan shellfish intended for sale for human consumption. Within the CDPH, the Environmental Management Branch (EMB) regulates shellfish sanitation in the growing waters. CDPH - 1

CDPH EMB staff has reviewed the Humboldt Bay Mariculture Pre-Permitting Project Draft EIR (DEIR) and has the following comments for your consideration.

Section 5.9.32 of the DEIR states the following: "The CGP (County of Humboldt 2005), City of Arcata General Plan (City of Arcata 2008) and City of Eureka General Plan (City of Eureka 1997) contain further goals and policies related to water quality. Additionally, under Section 303(d) of the CWA, Humboldt Bay is listed for PCBs and dioxin/furan compounds (HBHRCD 2006)".

Given the 303 (d) listing for PCBs and dioxin/furan compounds for Humboldt Bay, CDPH would like to know why is there no mention of public health concerns for potential accumulation of these contaminants in the cultured shellfish from the areas specified for expansion in Humboldt Bay as a result of this project. What strategy will be implemented to assure that the cultured shellfish meat harvested from the growing areas targeted for expansion will not contain contaminants at levels of public health significance and be safe for human consumption? CDPH - 2

Thank you for considering our comments on this DEIR. We will look forward to your response.

Environmental Management Branch, MS 7404 • P.O. Box 997377 • Sacramento, CA 95899-7377
(916) 449-5673 • (916) 449-5665 FAX
Internet Address: www.cdph.ca.gov

If you have any questions please contact Eric Trevena at (916) 449-5695.

CDPH - 2

Sincerely,

Mark L. Jeude, R.E.H.S., Chief
Environmental Health Services Section
Environmental Management Branch

Adam Wagschal

From: HBHRC Clerk <clerk@humboldtbay.org>
Sent: Thursday, March 12, 2015 3:39 PM
To: 'Patti Tyson'; 'Adam Wagschal'
Subject: FW: Comments DEIR for the Humboldt Bay Mariculture Pre-Permitting Project

Forwarding public comment

From: Jeff Todoroff [mailto:jeff.todoroff@gmail.com]
Sent: Thursday, March 12, 2015 3:09 PM
To: Clerk@humboldtbay.org
Subject: Comments DEIR for the Humboldt Bay Mariculture Pre-Permitting Project

March 12, 2015

Dear Director Crider and Commissioners,

Todoroff - 1

Thank you for the opportunity to comment on the Draft EIR for the Humboldt Bay Mariculture Pre-Permitting Project.

I am a veterinarian with a deep interest in zoology and ecology, as well as a sportsman. I retired to this area largely because of the Humboldt Bay ecosystem, which is unique in California. As an individual I have spent well over a million dollars in the community over the past 7 years, no small benefit to the area. I have enjoyed birding around the Bay as well as fishing and hunting in the Bay. Indeed, hunting for Pacific Black Brant was one of my initial attractors to the area, and I have since become fascinated by their biology.

Eelgrass is, to a great extent, what makes Humboldt Bay unique. Eelgrass in and of itself is a terrific resource, providing habitat and food for a wide variety of species. It is of central importance to the ecology of Humboldt Bay, to be celebrated and nurtured, and is a unique attribute of the bay.

Brant rely heavily on eelgrass as their preferred food. Humboldt Bay is the only substantial source of eelgrass between their wintering areas in Mexico and Puget Sound, the next main stopover site to the north.

Brant stage at Humboldt Bay for several months during late winter and spring. Gaining weight by eating eelgrass is critical to their reproductive success. Disturbance is energetically costly to these birds, as flight consumes calories that would otherwise help them in reproduction, so avoiding disturbance is important. Brant rely not only on eelgrass but require grit at least every other day to

digest the eelgrass. Hence gritting sites are also of critical importance to the birds. This seems to be completely ignored in this report; indeed proposed Intertidal Site 4 (Figure 2), as well as Intertidal Site 3, are important gritting sites, as there are few other areas in Arcata Bay with sand exposed at the usual levels of tides.

Older literature suggests that over 80% of Brant use the South Bay and only about 20% use Arcata Bay, but current observations suggest an apparent shift in use from the South Bay to Arcata Bay; this should be evaluated in a new study before dismissing use of Arcata Bay as having minimal impact on the species.

Intertidal Site 2 (Table 10) is proposed to use 35 acres of “dense” eelgrass and 246 acres of “patchy” eelgrass (bizarrely defined as covering less than 84% of substrate). Experienced scullers suggest that most of the area seems to be occupied by dense eelgrass, so reassessment of the actual area of “dense” eelgrass may be warranted. Further, this site is located in the east side of North Bay where any disturbance or physical impediment to taking off (i.e cultch on longline) will have a maximum negative impact on waterfowl that feed and rest in the area. It would seem preferable to avoid using any area east of Arcata Channel, if this is to be done at all.

I am alarmed at the stance this DEIR takes in the apparent trivializing of the impact of increased mariculture in Humboldt Bay. Reducing the total area of existing and proposed loss of eelgrass beds to a percentage of habitat existing in Arcata Bay COMPLETELY ignores the biological impact of disturbance and fragmentation. Even with this math, the proposed loss of another 622 acres of eelgrass (to the Coastal Seafoods Project being prepared) would suggest that we are ready to accept sacrificing one-third of all the eelgrass beds that largely define the character of the Bay in order to gain fewer than 50 jobs.

We have already sacrificed 90 percent of the salt marsh, another important ecosystem, around Humboldt Bay. This proposal suggests that losing 30% of “patchy” eelgrass and 5% of dense eelgrass is acceptable. The Coastal Seafoods Project proposes to take another 622 acres of mostly dense eelgrass beds, bringing the loss of dense eelgrass beds to 40% of existing acreage.

To conclude that the cumulative impact of these projects will be less than significant without mitigation seems somewhere between specious and irresponsible.

We are already produce the bulk of California's oysters. I have no problem at all with oyster production and producers, but there has to be a way do this without further affecting eelgrass beds and Brant geese. Perhaps restriction of mariculture sites to the west side of Arcata Bay can be investigated further. In light of the above comments, subtidal production (Alternative 1) is more appealing.

As it stands now, I am compelled to oppose the proposed project.

Todoroff - 1

Sincerely,

Richard J. Todoroff, DVM

PO Box 4508

Arcata, CA 95518

Adam Wagschal

From: Jack Crider <jcrider@humboldtbay.org>
Sent: Monday, March 23, 2015 3:02 PM
To: 'Adam Wagschal'
Subject: FW: Mariculture pre permitting EIR comment

From: longfish [mailto:longfish@humboldt1.com]
Sent: Monday, March 23, 2015 2:08 PM
To: Jack Crider
Subject: Mariculture pre permitting EIR comment

Allen 1

Hi Jack, although the public comment period is likely over for the mariculture pre-permitting project I do have something to say. I am for oyster farming expansion in the bay and have no troubles with the Coast Oyster plan. But I just looked closer at the pre-permitting EIR and was surprised to see the two locations named Intertidal Site 1 and 2. These locations are in prime waterfowl hunting areas and will cause a conflict with hunters and likely the US Fish and Wildlife.

Hunting this area is primarily done in a scull boat and is only allowed on Wednesdays, weekends, and holidays. This is because the US Fish and Wildlife has designated the area as a resting place for migrating ducks and geese. They sit in large rafts throughout North Bay during the fall and winter.

Sculling is the only way to hunt these birds and this has been going on for 115 years. The method and boat design was invented here in 1900 for market hunting ducks. After commercial hunting was banned, the practice continued by sport hunters. I have been sculling the Bay since I was 16 and currently take my partner Gene, who is disabled. This is one of the few opportunities he has to hunt ducks. Last year I plotted our hunting path on Google Earth. We left the boat ramp under the Samoa Bridge and rowed/sculled north. We had to row a long way to get past the oyster buoys and into the ducks. We took a lap around Sand Island and back to the ramp, total 8.5 miles. We only got 6 ducks but it was a lot of fun.

The conflict comes when oyster workers are on the Bay disturbing the ducks. We noticed this last year with outboard boats speeding around from site to site. The birds could not settle down. Although we would never hunt around someone working the Bay, we are often out there when it is calm and that includes foggy days. The fog helps hide the low profile boats from the ducks but could also hide the workers from the hunters.

The US Fish and Wildlife and CDFW permit limited hunting certain days of the week to allow the birds to rest. I wonder if they would limit work operations for the same reasons. In my experience, the birds like to raft in the areas with slower tidal currents in the upper reaches of the Bay. As the tide falls the birds occupy the edges of the remaining water at low tide.

Without knowing the criteria for selecting a good mariculture site I cannot suggest alternate locations. There are lots of places where ducks don't rest and hunting is not allowed. Hopefully you can consolidate the work areas closer to Eureka City property and existing mariculture operations.

Respectively,

Casey Allen
707-845-9234

HUMBOLDT STATE UNIVERSITY
Department of Biological Sciences

16 February, 2015

To: Humboldt Bay Harbor Recreation & Conservation District

Re: Environmental Concerns about the Coast Seafoods Permit Initial Study

Dear Mr. Crider,

We are responding to the Harbor District's solicitation for public input as part of the scoping meeting on February 16, 2015 about the Coast Seafoods Permit Draft Initial Study.[1] Our comments are confined to the effects of the proposed mariculture practices on eelgrass and therefore eelgrass ecosystem functions. We are not commenting on other effects that mariculture sites have on eelgrass communities (e.g. changes to patterns of water circulation and sedimentation[2], establishment of a different kind of benthic community, brant and wigeon, boating). HSU - 1

Our evaluation of the proposed mariculture plan on eelgrass must start by acknowledging that the oyster dredging in the bay, which ceased ~1996, must have been much more disturbing to the eelgrass beds than the currently used long lines. Also, the variability in abundance of eelgrass at sites formerly used for bottom culture (but no long lines at time of study) is not correlated to the number of years since the site was last dredged (see attached 2003 letter by F. Shaughnessy), indicating that there are environmental factors that affect eelgrass abundance which have nothing to do with mariculture operations. However, seagrasses like eelgrass are in decline around the world,[3] and even long line systems can negatively affect eelgrass bed functions by shading the plants, and/or the plants get trampled during the course of operations. Therefore, based on the best available science inside and outside of Humboldt Bay, we feel that the proposal to increase the acreage for cultch and basket long lines[1] will negatively affect functions of the eelgrass bed. The degree of those affects, however, cannot be ascertained without a study that tests for the effects of current and future mariculture methods. A different type of benthic community that may include some eelgrass can become established on and under mariculture infrastructure, and it will provide its own ecosystem functions, but they will not be the same as those of undisturbed, natural eelgrass beds.

Seagrasses, like eelgrass, have multiple ecosystem functions, some of which are better known than others.

- **Trophic support**. Seagrass ecosystems are amongst the most productive of any aquatic or terrestrial ecosystem in the world.[4] Eelgrass photosynthesis fixes about half of the carbon in a given area of the bed and the balance is fixed by microalgae on the eelgrass leaves.[5] This carbon is either consumed directly or after it becomes detritus.[6] Both pathways ultimately support a diverse set of animals many of which are commercially valuable, like Dungeness crabs, rockfish, bivalves and Black Brant geese.[7] By grazing on the eelgrass and adding their fecal matter to the eelgrass beds,

Brant increase the rate of eelgrass growth[8] thereby enhancing all of the eelgrass ecosystem functions, including trophic support.

HSU - 1

- **Refuge**. The three dimensional structure provided by high shoot densities provides a refuge from predation for the juvenile stages of animals like the Dungeness crab and rockfish.[7,9] In South Bay the greatest numbers of juvenile Dungeness crab are found in the late spring when two conditions are met: close proximity to a channel, and high shoot densities.[10]

- **Nursery**. The microalgae along with the small invertebrates that live within seagrass bed sediments and on seagrass leaves are all sources of food for the juvenile stages of many larger fish, invertebrates and birds.[7]

- **Sediment stabilization & water clarity**. Below thresholds of hydrodynamic force created by tidal and wind waves, seagrasses slow water velocities enough to allow existing sediments to be stabilized, and new sediments to be added to the bed.[11]

- **Carbon sequestration**. Although the combination of mangrove swamps, salt marshes and seagrass beds account for less than 0.5% of the world's sea bottom, in combination these habitats capture 50 – 71% of all the carbon stored in the ocean.[12] Sequestration in these habitats occurs because the carbon that is not used for trophic support is stored underground where it resides for long periods of time.[13]

- **Saving oysters**? The acidification (lowering of pH) of the oceans due to increasing concentrations of aqueous CO_2 is a concern for all calcifying animals, including the oysters and clams grown in Humboldt Bay. We know from the local CeNCOOS data that some aspect(s) of Humboldt Bay is buffering the bay from acidic ocean water; when there is a large upwelling event in Trinidad as indicated by a significant drop in pH, the pH in the bay becomes more basic over the course of a few hours. Why? One hypothesis is that eelgrass is raising the pH of bay waters. Since eelgrass photosynthesis is CO_2 limited, it has the potential to reverse or buffer the drop in pH by removing the CO_2 from the water.[14,15] There have been two modeling studies on this possibility, one of which estimated that a tropical seagrass would locally raise pH values over a coral reef,[16] and a second study of eelgrass in Puget Sound which showed that eelgrass was unlikely to have much of a buffering effect except in shallower bays, like Padilla Bay – which is similar to Humboldt Bay.[17] Macroalgae should also have a fairly high buffering capacity, and to a lesser degree this is also the case for microalgae.[18] There are two other hypotheses that could explain how bay water becomes more basic so quickly. Temperature changes could alter the carbonate equilibrium, or re-suspension of calcite in sediments by tidal currents could be altering alkalinity.[19]

In Humboldt Bay, and in estuaries around the world, one of the biggest threats to these seagrass functions is the loss of light which, in Humboldt Bay, is due to suspended sediments and any kind of shading structure, like cultch and basket long lines, that reduce the quantity of light

reaching the plants below a critical threshold.[20,21] Eelgrass in northern Humboldt Bay is more light limited than in the southern bay as indicated by the fact that eelgrass maximum depths in North Bay are shallower than in the South Bay.[22] This is also part of the reason why eelgrass shoot densities are lower in North Bay than South Bay.[23] In addition to suspended sediments and shading structures, the light environment in all of Humboldt Bay is becoming more stressful because the land on which eelgrass is growing is sinking at the same time that the surface of the ocean is rising due to global sea level rise.[24] Lowered light and the trampling that occurs during mariculture operations would combine to negatively affect eelgrass bed functions to some presently unknown degree.

HSU - 1

A monitoring study could be designed to identify the degree to which eelgrass would be negatively affected by mariculture infrastructure and activities, but the previous study by Rumrill and Poulton (2004)[25] on mariculture effects on eelgrass and the eelgrass community in northern Humboldt Bay needs to be considered before a new monitoring study is initiated. We tentatively agree with their finding that more closely spaced long lines have the most negative effect on eelgrass cover and shoot density (Figs 7, 8); their results are consistent with the known effects of low light on seagrasses.[7] There are, however, limitations to this study that need to be rectified if a new study is undertaken. These include:

1. Replication of a particular treatment, such as the 5' spacing of long lines, did not occur. Twelve photoquadrats from the same treatment site do not constitute 12 replicates because they are not independent from each other (they are nested within site). There needs to be multiple sites of the same treatment.

2. Sampling within a site (treatment or control) was not designed to distinguish the eelgrass conditions directly below a long line versus between lines. It appears from the report[25] that the photoquadrats were on one transect that was placed through the site. The need to stratify this sampling is critical since it is unlikely that 600 acres of long line expansion will negatively affect 600 acres of eelgrass (but see other public input about brant and wigeon).

3. There were multiple issues with the use of control (i.e. reference) sites which, in this report,[25] meant 'without long lines'. Control sites included both beds that were formerly used for bottom culture as well as sites that had not experienced any kind of mariculture. The types of control sites used should be determined by the history of the sites where current lines occur and future lines could occur.

   The spatial placement of control sites across North Bay (1 close to the long line treatments, 5 others more widely scattered) would have maximized the variability of eelgrass metrics among the replicated control sites, potentially resulting in statistically nonsignificant differences between control and treatment sites when they actually exist. A choice needs to be made between two questions. Do we want to know the effect of a particular mariculture treatment that will occur in a certain area on the eelgrass *in that area*, or do we want know the effect of a mariculture treatment relative to the entire North Bay eelgrass population? If the former, then a paired design is more appropriate (i.e. each treatment replicate is paired to its own control replicate, which is situated very close to the treatment site so that the primary way that they differ is the treatment itself). The difference between each pair then becomes

a more powerful approach for detecting the level of a treatment effect against a background of eelgrass variability in North Bay resulting from differences among beds due to depth, wave energy, brant and wigeon use, and water quality.

HSU - 1

We recommend a monitoring study that is built to address the following hypotheses:

1. Eelgrass shoot densities underneath sets of existing long lines are lower than densities within paired reference sites.

2. Shoot densities in spaces between sets of existing long lines are lower than densities within paired reference sites. The combination of hypotheses 1 & 2 would identify the *degree* to which shoot densities were reduced, and would also allow for an estimate of the *spatial area* that was experiencing this reduction. The use of existing long line sites is important because, depending on the pattern of future long line placements, the present set of lines might serve as a predictor of future effects on eelgrass, and/or provide a basis for modifying future placements. While we accept that current long line culture is spaced more tightly than the new long lines will be, the data provided by surveying the effects of this much longer-term culture will be valuable. Since shading is one of the major direct impacts, the more closely spaced lines will almost certainly have a greater impact than the new aquaculture. Data on these effects will provide a very valuable upper limit on the expected long term impacts of long line culture.

3. Shoot densities underneath new pilot long line sites will be less than the densities that existed there before the new sites were established. This hypothesis could be divided into underneath and between sets of lines, like 1 & 2.

4. Shoot densities underneath new pilot long line sites will be less than densities within paired reference sites.

5. Over time the shoot densities within the new pilot sites will increase and approach, but remain lower than, shoot densities within paired reference sites.

6. Shoot densities within all the study sites (reference + pilot mariculture) will vary among years at the landscape scale. This effect could be detected by using all of the study sites in combination with remote sensing. The aerial extent of eelgrass and its shoot densities can show a lot of interannual variation due to changes in sea surface state as well as the effect of sea level rise on the amount of suitable habitat available for eelgrass.[24,26]

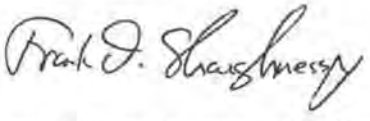
7. Brant and wigeon use of eelgrass in long line beds will be less than in paired control beds.

HSU - 1

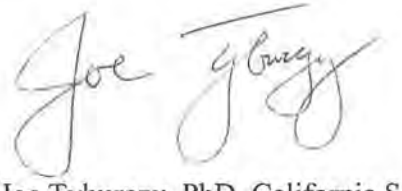
To ensure objectivity and transparency and avoid conflicts of interest, monitoring efforts that are part of this permitting process should be independent, financially and otherwise, of any of the parties involved in bay mariculture including the aquaculture companies as well as the Humboldt Bay Harbor Recreation & Conservation District.

Seagrass ecosystems around the world are in a state of decline for a variety of reasons, with habitat loss and factors degrading the light environment being two of the more prominent negative influences.[7] We have summarized the importance of the many functions of the eelgrass ecosystem, and we also want to emphasize that these functions have an economic value – albeit values that are difficult to quantify.[27] For example, very conservative estimates for specific seagrass fisheries range from as little as US \$8.00 · ha^{-1} · yr^{-1} to US \$2,500.00 · ha^{-1} · yr^{1}.[3,27,28] Monitoring data acquired before the full expansion of mariculture operations could enable the development of a culture plan that minimizes the impact on the ecological and economic values of the eelgrass ecosystem. The right time to conduct a well-designed study on potential impacts is before the establishment of new lines so the study can inform whether the community would support such a proposal.

Sincerely,



Frank J. Shaughnessy, PhD, Professor of Botany



Joe Tyburczy, PhD, California Sea Grant Extension, Adjunct Professor of Biology

Jeffrey M. Black, PhD, Professor of Wildlife Biology

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Section 2: Responses to Comments

Master Response 1

Since 2013, the Harbor District has been working to determine the ownership and lease status of tidelands within the project area. This assessment has involved mapping of existing leases and working with staff from the State Lands Commission to determine if tidelands are privately owned. At the time the DEIR was released, it was believed by District staff that valid private ownership within the project area was unlikely. However, since that time, land patents have been discovered that indicate a large portion of the project's intertidal area may be privately owned. Within this area, regulatory approvals for mariculture cannot be obtained unless agreements (e.g., leases) are established between the Harbor District and the private landowners. Establishing such agreements will take substantial time. Under CEQA, project alternatives are not considered feasible if they cannot be accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (CEQA Guidelines 15364). The Harbor District has determined that the Preferred Project and Alternative 2 (Intertidal Culture Only) are currently not feasible, because the timeframe for reaching agreements with the landowners will not allow the project to be completed in a reasonable period of time. The presence of private ownership could also result in substantial changes to the intertidal portion of the proposed project (e.g., areas where leases can't be established with private landowners could be removed from the project). Primarily due to the current infeasibility of the Preferred Project and Alternative 2 (Intertidal Culture Only), the District is adopting the environmentally superior alternative (Alternative 1: Subtidal Culture Only). As such, the Intertidal Sites are not being considered for adoption. Because future permitting and culture at the proposed intertidal sites is uncertain, many of the questions pertaining to the intertidal sites are not fully explored in this response to comments. Rather, the focus of this response to comments is Alternative 1, the alternative that is being considered for adoption.

Master Response 2

This group of comments requests more specifics regarding project design elements. As described in the DEIR, it is the project's intent to allow flexibility in methods, within the constraints established by the specific environmental thresholds identified (see DEIR Table 2) and with implementation of mitigation measures. Environmental effects can be adequately assessed based on these criteria/thresholds, without identifying more specific design features. Farming requires flexibility in methods, particularly when farming in new areas. Hence, requiring farmers to implement highly specific design features may not allow for successful farming and could result in not meeting project goals.

Response to Comment NMFS-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment NMFS-2

See Master Response 2

Response to Comment NMFS-3

Negotiations are ongoing between the Harbor District and potential lessees of the sites. The number and spatial configuration of leases is in flux. As such, the information requested is not known and cannot inform the environmental analysis. Basing the environmental analysis on the thresholds described (e.g., levels of activity, cultured shellfish biomass, etc.) is adequate.

Response to Comment NMFS-4

This comment is related exclusively to the project's Intertidal Sites, which are not being considered for adoption. See Master Response 1.

Response to Comment NMFS-5

See Master Response 2.

Response to Comment NMFS-6

No shading minimization measures are incorporated into the subtidal culture methods. The light does not penetrate deep enough to reach the bay bottom and support eelgrass growth at the locations where raft structures will be located. If the raft structures were to be placed over eelgrass then such minimization measures would help reduce effects to eelgrass. However, by not placing the rafts over eelgrass, such minimization measures are not considered useful.

Response to Comment NMFS-7

This calculates to 677 square feet or 78 square feet per acre (based on Subtidal Site 3 conceptual layout). This is less than the recommended threshold of 102 square feet per acre (Draft EIR, Table 6).

Response to Comment NMFS-8

No specific temporal restriction is placed on pile installation by the EIR. The number of piles per day and anticipated noise levels are not known, but a commitment is made that "A cumulative sound exposure level of 183 dB re: 1uPa2*sec and a peak sound pressure of 206 dB re: $1uPa_{peak}$ as measured 10 m from the source shall not be exceeded" (EIR, MITIGATION BIO-10). Achieving this may require limitations on piles installed per day or use of sound attenuation devices. EIR MITIGATION BIO-11 describes additional measures to reduce potential impacts. With these measures, potential sound disturbance to fish and wildlife is less than significant.

Response to Comment NMFS-9

Some impacts to eelgrass are anticipated. See EIR IMPACT BIO-12.

Response to Comment NMFS-10

This comment is related exclusively to the project's Intertidal Sites, which are not being considered for adoption. See Master Response 1.

Response to Comment NMFS-11

This comment is related exclusively to the project's Intertidal Sites, which are not being considered for adoption. See Master Response 1.

Response to Comment NMFS-12

As this relates to Intertidal Culture, see Master Response 1.

For Subtidal Culture, the calculations are as follows:

For Surface Area (DEIR Section 2.5.5.2): An assessment of Subtidal Site 3, which is 8.7 acres, revealed that the following culture equipment would be appropriate:

- Two floating walkways that are 538 ft x 10 ft each
  - Surface area for this component is 2*538*10 = 10,760 ft^2
- One floating walkway that is 214 ft x 10 ft
  - Surface area for this component is 1*214*10 = 2,140 ft^2
- 18 FLUPSYs that are 82 ft x 22 ft each
  - Surface area for this component is 18*82*22 = 32,472 ft^2
- Six FLUPSYs that are 45 ft x 25 ft each
  - Surface area for this component is 6*45*25 = 6,750 ft^2
- 10 culture rafts that are 12 ft x 24 ft each
  - Surface area for this component is 10*12*24 = 2,880 ft^2

The surface area for each component was summed, which equates to 55,002 ft^2. Because this is the surface area considered for an 8.7 acre site, it is standardized to what would be allowed per acre by dividing 55,002 by 8.7, which results in the proposed surface area threshold of 6,322 ft^2 per acre.

For Volume (DEIR Section 2.5.3.2): An assessment of Subtidal Site 3, which is 8.7 acres, revealed that the following culture equipment would be appropriate:

- 18 FLUPSYs that are 82 ft x 22 ft x 4 ft each
  - Volume for this component is 18 * 82 * 22 * 4 = 129,888 ft^3
- Six FLUPSYs that are 45 ft x 25 ft x 45 ft each
  - Volume for this component is 6 * 45 * 25 * 45 = 303,750 ft^3
- 10 Culture Rafts that are 12 ft x 24 ft x 4 ft each
  - Volume for this component is 10 * 12 * 24 * 4 = 11,520 ft^3

The volume for each component was summed, which equates to 168,408 ft^3. Because this is the surface area considered for an 8.7 acre site, it is standardized to what would be allowed per acre by dividing 168,408 by 8.7, which results in the proposed surface area threshold of 19,357 ft^3 per acre.

For Benthic Footprint (DEIR Section 2.5.4.2): An assessment of Subtidal Site 3, which is 8.7 acres, revealed that the following culture equipment would be appropriate:

- Three floating walkways each with four anchors that are 6 ft^2
  - Benthic footprint for this component is 3 * 4 * 6 ft^2 = 72 ft^2
- 24 FLUPSYs each with four anchors that are 6 ft^2
  - Benthic footprint for this component is 24 * 4 * 6 ft^2 = 576 ft^2
- 10 Culture Rafts each with four anchors that are 6 ft^2
  - Benthic footprint for this component is 10 * 4 * 6 ft^2 = 240 ft^2

The benthic footprint for each component was summed, which equates to 888 ft^3. Because this is the benthic footprint considered for an 8.7 acre site, it was standardized to what would be allowed per acre by dividing 888 by 8.7, which results in the proposed benthic footprint threshold of 102 ft^2 per acre.

Response to Comment NMFS-13

In response to this comment, the following underlined text was added to Section 1 of the EIR.

> Step 2. Before, during and immediately after installation of culture equipment, Harbor District staff will visit the culture sites to assess the proposed culture layouts and further ensure consistency with Lease requirements. Staff from all permitting agencies, agencies commenting

on this DEIR, and any other interested agency will be invited to attend the site visits to provide input.

Response to Comment NMFS-14

In response to this comment, the following underlined text was added to Section 1 of the EIR.

> Step 3. If it is determined that the proposed activity is consistent with Lease requirements, and any other Harbor District requirements, then the District will enter into a Lease with the Lessee, and the Lessee may implement their culture activities as proposed. When a lessee proposes a new culture method or an adaptation of the general culture methods, staff from all permitting agencies, agencies commenting on this DEIR, and any other interested agency will be invited to provide input regarding the appropriateness of the method.

Response to Comment NMFS-15

> In response to this comment, the following underlined text was added to Section 1 of the EIR.
> Step 5. Each Lessee will provide an annual report to the Harbor District. This report will describe the culture site's current status of operations, production, culture methods and relationship to the thresholds described below and all other lease requirements. The reports will include an assessment of the originally proposed culture operations versus existing ("as built") conditions (including a description of location, methods, equipment and any other pertinent information). The reports will also document the state of operations and upkeep on the site, including the presence of discarded, broken or abandoned tools, gear or equipment. Reports will also include representative site photographs. As requested, the Harbor District will provide copies of the annual reports to staff from all permitting agencies, agencies commenting on this EIR, and any other interested agency.

Response to Comment NMFS-16

MITIGATION BIO-3 will allow for avoidance of eelgrass plants. Further monitoring is not recommended because (1) only minor impacts (if any) are expected; and (2) high natural variation in eelgrass density coupled with the expectation for only minor (if any) impacts would make it impractical for monitoring to detect any level of impact.

Response to Comment NMFS-17

The DEIR does identify potential environmental effects and provide a thorough analysis to determine the significance of those effects.

Response to Comment NMFS-18

Regarding Intertidal Sites, see Master Response 1. For the Subtidal Sites, with the proposed 1 meter buffer, impacts to eelgrass are expected to be minor, if there are any at all, and undetectable. The statement that the California Eelgrass Mitigation Policy (CEMP) (NMFS 2014) recommends a 5 ft. buffer is inaccurate; the CEMP does not recommend this.

Response to Comment NMFS-19

The carrying capacity analysis is based on the peer reviewed and published work of Gibbs (2007). We reviewed a number of different models, including the FARM model (Ferreira et al. 2009) to determine which would be most suitable for the project. We selected the model based on Gibbs (2007) because 1) the model and results are more understandable and transparent than other models reviewed; 2) the model adequately addresses our

research questions; and 3) there is sound data available to populate the model. We are not aware of how the model has been used elsewhere. The model's metrics apply well to the proposed intertidal and subtidal shellfish culture because they are based on inlet volume, tidal exchange, shellfish clearance rate, shellfish biomass and phytoplankton production; all parameters that can be ascertained equally well for intertidal and subtidal culture. The depletion footprint was not calculated because it can only be calculated once the shellfish are actually in the bay and the purpose of this analysis was to determine potential project effects prior to planting the shellfish, in order to identify appropriate avoidance, minimization and mitigation measures.

Response to Comment NMFS-20

The biomass estimates in Tables 5 and 7 are unrealistically high. A more detailed analysis was conducted for the carrying capacity analysis, which included estimates of different shellfish age classes (sizes) that would be present in the bay at any given time. This substantially reduced the estimated biomass. Also, with adoption of Alternative 1 (this is the alternative being proposed for adoption, see Master Response 1), the project would only add approximately 3.29 metric tons (dry tissue weight) rather than the 84.44 metric tons considered in the Preferred Project. A revised carrying capacity analysis is included in FEIR Appendix C.

Response to Comment NMFS-21

The analysis does consider the tidal prism volume of Arcata Bay, as recommended in the comment.

Response to Comment NMFS-22

Uncertainty in residence times is common and is noted by Gibbs (2007). Whereas Gibbs (2007) used the mean value of reported residence times in an example analysis, we opted to present separate analysis for each reported residence time, including that reported in the publication by Bricker et al. (2007).

Response to Comment NMFS-23

As noted in the comment, Gibbs (2007) stated that bivalves can consume five times their biomass (5:1). We compared our shellfish carbon biomass calculations to our calculations of the amount of carbon consumed, resulting in an average 3.8:1 ratio at a clearance rate of 2.54 L/g/h and 7.1:1 at a clearance rate of 4.78. Hence, our estimates correspond well with Gibbs (2007) reported 5:1 ratio. See the revised carrying capacity analysis (EIR Appendix C) for further details.

Response to Comment NMFS-24

Seasonal information regarding phytoplankton production is not available to conduct the suggested analysis. The existing analysis, which is based on Gibbs (2007) is adequate to assess the pertinent questions related to the effects of shellfish culture on food resources and the food web.

Response to Comment NMFS-25

As described by Gibbs (2007), "no single indicator on its own will provide all the required information and hence multiple indicators are necessary". Our analysis and conclusions account for the information provided by all the indicators. Specifically, as described in the EIR and carrying capacity analysis (EIR Appendix C), indicators that don't take into account the highly productive waters of the north coast and Humboldt Bay are relatively high (i.e., indicate a "relatively high" impact to the food resources). However, indicators that account for the high productivity of the area indicate that food resources are abundant enough that wild species would not be significantly affected by changes in food availability resulting from the project. All assumptions in the analysis were conservative (i.e., where assumptions were needed, we consistently erred to assumptions that would result in the greatest impact to the food resources). In doing so, we substantially accounted for potential uncertainty in the data and likely overestimated impacts to food resources.

Response to Comment NMFS-26

As described above and in the revised carrying capacity analysis (EIR Appendix C), the model used, which is based on Gibbs (2007), is well fitted to the research questions being assessed. Comments from the NOS/CAPES Technical Review are responded to below. Further research, including field testing and modelling, would provide further information, but is not needed to determine the relation of the project to the established CEQA thresholds.

Response to Comment NMFS-27

This comment is related exclusively to the Project's Intertidal Sites, which are not being considered for adoption. See Master Response 1.

Response to Comment NMFS-28

Regarding the Intertidal Sites, see Master Response 1.

Regarding Subtidal Sites. These sites are in a channel where there is adjacent dredging and there has been substantial addition of fill on the channel margin, which has narrowed the channel. The result is relatively fast current. The likely result of adding shellfish culture equipment and shellfish at these sites is a slowing of currents, resulting in increased sedimentation and shallowing (shoaling) near the equipment. At some locations, shoaling may decrease water depth to a point where eelgrass may receive enough light to grow. This type of effect is already visible at Subtidal Site 3 where it is apparent that dock pilings have resulted in shoaling and eelgrass occurs in the shoaled areas. Increasing the abundance of eelgrass at the sites would be considered an environmental benefit.

Response to Comment NMFS-29

Regarding the Intertidal Sites, see Master Response 1.

Regarding the Subtidal Sites. The subtidal culture equipment is not expected to make the epibenthic or benthic infauna less accessible. Organisms can readily move among and/or around the culture equipment.

Response to Comment NMFS-30

This comment is related exclusively to the Project's Intertidal Sites, which are not being considered for adoption. See Master Response 1.

Response to Comment NMFS-31

The mitigation measure (MITIGATION BIO-1) referred to by the commenter (the "marine mammal procedures") are based on standard measures gleaned from other environmental documents, and professional opinion regarding reasonable measures to avoid impacts to marine mammals.

The commenter's statements pertaining to harbor seal locations in Arcata Bay and harbor seal pupping/haul out locations is related to the Project's Intertidal Sites, see Master Response 1 regarding these statements.

The behavioral disruption thresholds identified by the comment are incorporated in EIR MITIGATION BIO 10 and MITIGATION BIO 11.

Response to Comment NMFS-32

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment CAPES-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment CAPES-2

The commenter suggests that a different carrying capacity model should be considered for the analysis, citing the FARM model (see Ferreira et al. 2009) as an example. There is also concern suggested regarding the simplicity of the model that was used.

We contemplated the use of several different models, before settling on use of the Gibbs (2007) model. The models we considered are described in Shumway (2011). We consider the simplicity of the model developed by Gibbs (2007) is a positive factor. The model's simplicity makes it more transparent and understandable than the other models considered. Additionally, we found that the data needed to populate the Gibbs (2007) model is available, whereas data needed for other models is not. For example, the FARM model, which was suggested by the commenter, has data inputs for current speed, dissolved oxygen, particulate organic matter and suspended particles; acceptable data for these variables is not available. Certainly, each model may have pros and cons when compared to the other models, but the Gibbs (2007) model was adequate to assess the Projects environmental effects related to carrying capacity. Our conservative approach with data inputs (i.e., using assumptions that likely overestimate potential environmental impacts) combined with the transparency and ease of interpretation of model results makes us confident that this was a good model to apply to assess the established CEQA thresholds.

Response to Comment CAPES-3

Appropriately, the model (Gibbs 2007) is primarily based on annual averages of input parameters. Seasonal data (for example, for primary production) is not available to run the model with the suggested seasonal / temporal aspect.

Response to Comment CAPES-4

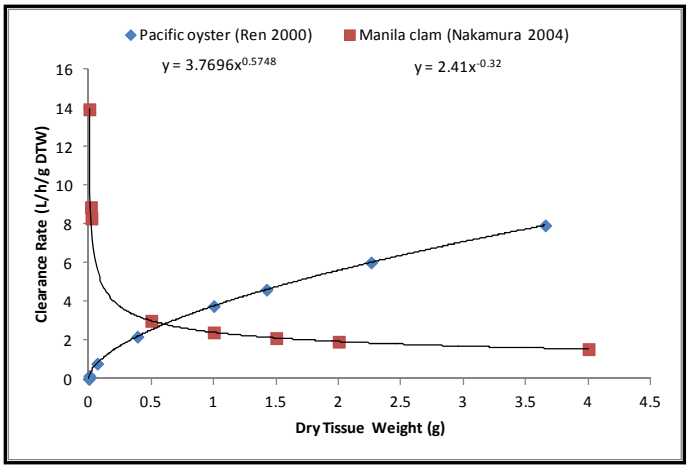
The project does not consider bottom culture, as suggested by the commenter; it only includes off-bottom intertidal culture and suspended subtidal culture. The model is appropriate, because the system and related parameters (e.g., feeding by shellfish, primary production, tidal flux) function essentially the same regardless of culture methods.

Response to Comment CAPES-5

The clearance rate used (2.54 liters of water cleared per gram of dry tissue weight per hour) is a reasonable assumption. Cranford et al. (2011) presents a mean clearance rate of 2.15 L/g/h for oysters consuming an algal-based diet and 4.78 L/g/h for a seston-based diet. Cranford goes on to note that studies utilizing an algal-based diet resulted in clearance rates of mussels, scallops, and cockles that were nearly two times higher than rates obtained utilizing a natural seston-based diet; but that the only exception was for oysters, where the sample size for seston diets was too sparse for an objective comparison. His final review and meta-analysis of oyster clearance rates, documented in 25 publications, yielded an average clearance rate of 2.54 L/g/h, with a standard error of ± 0.24. Cranford et al. (2011) states that, "The average rate for oysters feeding on both types of diets (2.54 L/g/h) is comparable with mussels, and cockles and scallops appear to have a relatively high rate of feeding."

An attempt was made to locate and utilize species-specific clearance rates for all species cultivated in Humboldt Bay (i.e. Pacific oysters, kumamoto oysters, and Manila clams). Clearance rate equations for Pacific oysters were published in Ren et al. (2000) but published clearance rates specifically for kumamoto oysters were not

located for the analysis and were not identified by the commenter. Clearance rate equations for Manila clams were presented in Nakamura (2004) but the organisms used in that study were not similar in size to cultured clams in Humboldt Bay. As a result, Nakamura's clearance rate equation for Manila clams yield spurious results when applied to the size-class produced in Humboldt Bay (e.g., 4mm [0.001 g]) (see figure below, indicating how for Manila clams the clearance rates become unrealistically high at low shellfish weights).



The lack of published clearance rate equations for kumamoto oysters in addition to Nakamura's equation producing questionable results for Manila clams leaves us with less confidence in utilizing a species-specific approach for clearance rates based on currently available information. As a result, we continue to utilize Cranford's average clearance rate of 2.54 L/g/h to calculate performance indicators in the carrying capacity analysis. Additionally, we present performance indicators based on the seston-based diet clearance rate (4.78 L/g/h) to present the higher range of possible impacts.

Response to Comment CAPES-6

A thorough review (such as Cranford et al. 2011) of polyploidy bivalve clearance rates was not located during a literature review. However, two previous studies that incorporated a comparison of diploid and triploid shellfish clearance rates did not detect a significant clearance rate difference for diploid or triploid animals (Kesarcodi-Watson et al. 2001; Guéguen et al . 2012). Hence, the values used in the existing model appear to be appropriate.

Response to Comment CAPES-7

Manila clam culture was considered in the carrying capacity analysis. In Humboldt Bay, current and proposed Manila clam culture is restricted to nursery production at subtidal areas.

Response to Comment CAPES-8

Correlations between chlorophyll concentration and tidal state was not included in the analysis of Gibb's performance indicators, but was presented in the report as a description of the ecosystem. Chlorophyll data were collected at the Central and Northern California Ocean Observing System (CeNCOOS) Dock B monitoring station. This site is located at a hydrographic/tidal bottle neck within Humboldt Bay and parcels of water present at this location are assumed to be representative of water that is tidally advected into and out of North Bay. Chlorophyll concentrations (µg/L) for incoming tides were calculated for each year by taking the average concentration during the period of time between one hour before and one hour after low tide for each tidal cycle. Concentrations for outgoing tides were calculated for each year by taking the average concentration during the period of time between one hour before and one hour after high tide. These incoming

and outgoing tide chlorophyll concentrations were then averaged for each year, and then years were averaged for an assessment of incoming and outgoing tide chlorophyll concentrations across years (see table below).

Year	Incoming Tide	Outgoing Tide
2003	2.5	1.9
2004	3.6	3.2
2005	3.0	2.7
2006	2.8	2.6
2007	3.1	2.7
2008	2.9	2.4
2009	4.5	3.5
2010	3.5	3.1
2011	2.9	2.4
Average	**3.2**	**2.7**

The lack of location specific information regarding seasonal variation in primary productivity of phytoplankton prevents accurate assessments of seasonal effects on the Filtration Pressure and Regulation Ratio performance indicators.

Response to Comment CAPES-9

No response is necessary because no concerns related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment CAPES-10

As described in the EIR and alluded to in comments CAPES 14 and 15; although the clearance efficiency is modelled to exceed the flushing rate under certain assumptions, this indicator does not take into consideration food availability in the bay. With food availability considered (the filtration pressure and regulation ratio indicators) the proposed aquaculture expansion is not expected to significantly impact food resources. The indicators need to be considered together to create a realistic understanding of potential impacts on food resources. Also note that Alternative 1 is being considered for adoption (see Master Response 1), which would only add approximately 3 metric tons dry weight of biomass to the bay versus approximately 22 metric tons under the Preferred Project.

Response to Comment CAPES-11

The analysis relies on published clearance rates. There is some uncertainty regarding clearance rates, but the available information is adequate to inform the analysis of potential impacts to food resources particularly with (1) the analysis in the revised Carrying Capacity model (Appendix A) that considers clearance rates based on a seston diet, and (2) the conservative nature of the analysis in erring to assumptions that would have the greatest impact on food resources. Overall, the analysis is most likely overestimating potential impacts. Also note that

Alternative 1 is being considered for adoption (see Master Response 1), which would only add approximately 3 metric tons dry weight of biomass to the bay versus approximately 22 metric tons under the Preferred Project.

Response to Comment CAPES-12

No response is necessary because no concerns related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment CAPES-13

There will always be benefits associated with further research and analysis. However, none of the comments received provide material evidence that the existing analysis is not adequate to assess the project's potential impacts to food resources. Additionally, as also described above, the suggested "dynamic modeling platform" has drawbacks including (1) lack of available data to populate the model; and (2) lack of the transparency that is gained with use of a more simplistic model such as the model employed for this analysis (i.e., Gibbs 2007).

Response to Comment PFC-1

It is not clear what thresholds the commenter is using as a basis for identifying a significant impact by the project on eelgrass and species dependent on eelgrass. As described in detail in the DEIR, the project is not expected to exceed the DEIR's established thresholds of significance.

Response to Comment PFC-2

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment PFC-3

These statements provide background regarding black brant. However, they don't specifically address the effects of the project, which are described in detail in the DEIR. These statements don't result in a change to the DEIRs analysis or conclusions.

Response to Comment PFC-4

Without any citations provided, it is not possible to know what type of structures black brant were avoiding in Gray Harbor or elsewhere. Observations in Humboldt Bay suggest that black brant do not avoid the aquaculture equipment that is currently present.

Response to Comment PFC-5

This may be true for the Intertidal Sites. However, culture of the Intertidal Sites in not currently feasible (see Master Response 1). There is no expected effect of boat traffic at the Subtidal Sites where there is not feeding by black brant. Additionally, boats don't traverse across black brant feeding areas in order to access the Subtidal Sites.

Response to Comment PFC-6

These statements provide background regarding black brant. However, they don't specifically address the effects of the project, which are described in detail in the DEIR. These statements don't result in a change to the DEIRs analysis or conclusions.

Response to Comment PFC-7

The extent that the commenter is requesting a decrease in the project footprint is not clear. By adopting Alternative 2 (see Master Response 1) the footprint is being reduced from 526 to 21 acres.

Response to Comment AUD-1

Some information contained in the comment is incorrect. Specifically, as described in the DEIR, there are approximately 300 acres of existing culture in Humboldt Bay, not 400 acres. Also, based on the detailed analysis in the DEIR, we disagree that the project would have significant, adverse effects on numerous habitats and species in Humboldt Bay.

Response to Comment AUD-2

We disagree. The DEIR provides a detailed analysis of potential environmental effects, none of which are found to be significant based on the established thresholds of significance. The DEIR also provides a detailed cumulative analysis of potential impacts from existing and foreseeable projects in the bay, including the two projects referenced in the comment (the Coast Seafoods Company Project and the Humboldt Bay Mariculture Pre-Permitting Project).

Response to Comment AUD-3

We disagree that any substantial expansion of mariculture operations would have significant, unavoidable impacts to the environment. Management decisions taken by the Harbor District in Humboldt Bay are guided by a marine spatial planning framework, which is informed by the Humboldt Bay Management Plan. The Pre-Permitting Project was developed during over 3 years of planning with substantial input from the public; trustee and responsible agencies; local elected boards and tribes. The project is designed to first avoid sensitive resources, particularly eelgrass and marine mammal haul outs, to the extent possible while meeting project goals. Furhter information regarding the project's site selection process is contained in the FEIR Appendix D.

Response to Comment AUD-4

The District has and will continue to work with responsible agencies, trustee agencies, stakeholders, the public and others regarding project design and appropriate mitigation measures.

Response to Comment AUD-5

No response is necessary because the comment is only providing background information regarding CEQA.

Response to Comment AUD-6

We disagree. However, it is worth noting that environmental analysis associated with projects involving activities such as shellfish culture are not as "black and white" as projects that, for example, involve activities like land development (e.g., building houses). Land development often removes all ecological values. However, as described in the DEIR, there are aspects of shellfish culture that have environmental benefits and aspects that have impacts. In the DEIR, the potential impacts are considered with respect to the established thresholds of significance.

Response to Comment AUD-7

No response is necessary because the comment is only providing background information regarding CEQA.

Response to Comment AUD-8

The DEIR analyses three alternatives. Alternatives 1 and 2 have different and reduced spatial footprints and methods than the proposed Project and Alternative 3 is the No Project Alternative. Alternatives 1 and 2 meet project objectives to a limited extent and with reduced environmental effects. Alternative 3 does not meet any project objectives. None of the alternatives have significant environmental effects based on the established thresholds of significance. The DEIR provides a detailed analysis of the environmental effects of each alternative. Alternative 1 was found to be the environmentally superior alternative and is being recommended for adoption.

Response to Comment AUD-9

No response is necessary because the comment is only providing background information regarding CEQA.

Response to Comment AUD-10

We disagree. As described in the DEIR, impacts are avoided to the extent possible by avoiding eelgrass beds and marine mammal haul out sites. Additionally, there are detailed and enforceable mitigation measures identified which will minimize effects. Also, as described in the DEIR, with mitigation no environmental effect is found to be significant based on the established thresholds of significance.

Response to Comment AUD-11

We disagree. This topic is further elaborated on in the responses below.

Response to Comment AUD-12

We disagree. As described in the DEIR, the future success of shellfish farming in Humboldt Bay requires that there is some flexibility in methods. The DEIR provides performance based thresholds for culture methods that are adequate to inform the environmental analysis. In every instance, the DEIR assumes a "worst case scenario" regarding potential environmental effects (i.e., the analysis assumes that methods with the greatest degree of environmental effect will be used, whereas in fact it is likely that methods with less effect will be implemented.)

Additionally, this comment relates only to intertidal culture (referenced in the comment as "Sites 1-4"), but only subtidal culture sites are being considered for adoption. See Master Response 1.

Response to Comment AUD-13

This comment relates only to intertidal culture. Subtidal culture is not expected to have any impacts to eelgrass and there is no information in the comments to the contrary. Only subtidal culture is being considered for adoption, see Master Response 1.

Response to Comment AUD-14

This comment is based on the fact that herring utilize eelgrass habitat within intertidal portions of the bay and the premise that the project's intertidal culture sites would significantly impact this use. However, the alternative being considered for adoption only includes the subtidal culture sites. See Master Response 1.

Response to Comment AUD-15

This comment primarily relates to the project's Intertidal Sites, which are not being proposed for adoption, see Master Response 1. Additionally, there is an unsupported statement that "Subtidal areas are also important".

There is no evidence or rationale that project operations at the subtidal sites would have a significant effect to waterfowl or shorebirds. This is particularly addressed in DEIR IMPACT BIO-5, IMPACT BIO-6, IMPACT BIO-8, and IMPACT BIO-11 and related mitigation measures.

Response to Comment AUD-16

This comment is related to project effects on black brant and shorebirds. There is no evidence or rationale that the subtidal sites, which are the only sites being considered for adoption, will have a significant effect on black brant or shorebirds. This is particularly addressed in DEIR IMPACT BIO-4, IMPACT BIO-6, IMPACT BIO-8, and IMPACT BIO-11 and related mitigation measures. See Master Response 1 with regards to the Intertidal Sites.

Response to Comment AUD-17

Each species listed in the comment is considered in the DEIR. As described in the DEIR, there is some potential effects to certain species. However, the effects are found to be less than significant based on the established CEQA thresholds. Continuing on the two examples cited in the comment. (1) The effect of overwater structure to salmonids was found to be less than significant, particularly because the overall area of overwater structure only represents 0.09% (cumulatively) of subtidal habitat in Arcata Bay (i.e., with the project, there would continue to be abundant subtidal habitat available for use by salmonids and the overwater structure created by the project is not expected to have a significant environmental effect). (2) The commenter is correct that "the reduction of planktonic food sources could directly affect smaller fish species and invertebrates as well as listed species that eat those small fish and invertebrates." However, based on comprehensive modelling, which considers all cumulative effects of shellfish culture on planktonic food sources and the food-web, the DEIR found that "…food resources are likely abundant enough that native species would not be significantly affected." This affect is determined to be less than significant and the comment does not bring forward any material new information to consider. However, it is worth noting that with adoption of Alternative 1 (see Master Response 1), the project would only add approximately 3.29 metric tons dry weight biomass rather than between 29.34-87.44 metric tons dry weight biomass under the preferred project.

Response to Comment AUD-18

As demonstrated in the DEIR, the relationship of shellfish culture, native species and habitats is complex and highly nuanced. The commenter's assertions that the project, and other projects, would degrade eelgrass habitat, disturb feeding shorebirds, affect essential fish habitat and adversely affect key forage species and species protected under the Endangered Species Act and California Endangered Species Act fail to recognize the complexities and nuances described in the DEIR. The DEIR, including the cumulative impact assessment, goes into great detail regarding the relationship of shellfish culture, native species and habitats and ultimately finds that although there are likely impacts, these impacts do not exceed the established thresholds of significance. The comment does not bring any material information forward to alter this finding.

Response to Comment AUD-19

The DEIR provides the information necessary for an informed determination on environmental impacts. Notably, this set of comments from Audubon Society does not bring any material new information forward for consideration. The comments attempt to undermine the credibility of the CEQA document with general statements, but don't provide any detailed information about what is lacking or inadequate. In some cases, the DEIR makes a presumption that another project with considerable cumulative effects ("the Coast Project") will utilize adaptive management and mitigation measures to minimize environmental effects. Based on our knowledge of the Coast Project at the time, this was reasonable to assume. These are cases in which we need to make our best predictions about how other projects will proceed in order to inform the cumulative effects

analysis, because we don't have full control over other projects. However, the District, as CEQA lead agency for the Coast Project, can and will impose such mitigation measures as needed.

Response to Comment AUD-20

Significant new information is not being added to the EIR. The most notable change is some expansion of the Carrying Capacity Analysis, which did not affect EIR conclusions and is not a significant or substantial change to that analysis.

Response to Comment AUD-21

A condition was included in the Harbor District's permit issued for Coast Seafood Company's existing tidelands culture (Permit 04-03). The mitigation measure (Mitigation 12) provided that, during the time of Coast Seafood Company's leases (noted to expire in 2015), "Aside from the 300-acre operational footprint established pursuant to the permit, Coast will not conduct oyster harvesting activities on any of its leased lands. This cessation of activity is intended to offset any perceived environmental impacts of Coast's operations on that 300-acre operational footprint." This measure was proposed by Coast for the Mitigated Negative Declaration associated with that project. The intent of the condition was to provide a conservative limit on production, given that the effects of the proposed cultivation, including the effects of longline culture, were not well known at the time. It was not intended to mitigate for any specific environmental impact. That condition was limited to the duration of the permit, and not intended to provide a permanent prohibition on the expansion of Coast's cultivated area or other culture. New information is now available, which informs the DEIR (e.g., Rumrill and Poulton 2004, HTH 2014, Connolly and Colwell 2005) and the prior mitigation measure is not necessarily needed to mitigate for identified environmental effects of the project or for other future projects.

Response to Comment AUD-22

The DEIR provides a comprehensive and detailed analysis which finds that the project would not have significant environmental effects based on the established CEQA thresholds. The project is designed to avoid impacts (by avoiding sensitive habitats (i.e., eelgrass) and species (e.g., marine mammals and species associated with eelgrass)), and minimize impacts through detailed and enforceable mitigation measures. The DEIR includes a science based assessment of all potential impacts, including cumulative impacts and consideration of alternatives. The environmentally superior alternative is being considered for certification. The DEIR is fully adequate and there is no reason for re-circulation.

Response to Comment Bates-1

This comment refers to habitat impacts associated with intertidal culture. However, the alternative being considered for adoption only includes the subtidal culture sites. See Master Response 1.

Response to Comment Bates-2

This comment primarily refers to loss of culture equipment associated with intertidal culture. The alternative being considered for adoption only includes the subtidal culture sites. See Master Response 1. However, there is some minor potential for equipment to be lost from the proposed subtidal culture operations. This would occur if equipment falls off of raft structures or boats. Mariculturists have financial incentive not to allow for equipment loss and for subtidal culture operations it is easy to protect equipment from loss (e.g., tie it down). Any loss is expected to be very minor. There is not potential for a significant impact associated with loss of equipment from subtidal culture operations.

Response to Comment BK-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment BK-2

With adoption of Alternative 1 (see Master Response 1) that only involves subtidal culture, no impacts to eelgrass can be expected and no eelgrass monitoring is proposed.

Response to Comment BK-3

Through MITIGATOIN BIO-4, which requires a 1 meter buffer around all eelgrass plants, dense eelgrass patches will be avoided as suggested by the comment.

Response to Comment BK-4

With adoption of Alternative 1 (see Master Response 1) impacts to recreational activities will be negligible. The project sites are adjacent, but not within, a deep water channel that is used for boating.

Response to Comment BK-5

With adoption of Alternative 1 (see Master Response 1) aesthetic impacts will be negligible. The project sites are adjacent to industrial land in areas with existing docks, pilings and other structures. As detailed in the DEIR, there is not expected to be a significant effect.

Response to Comment BK-6

With adoption of Alternative 1 (see Master Response 1) which only includes subtidal culture, the type of equipment used (e.g., rafts, trays, etc.) is not susceptible to equipment loss in the way that equipment associated with intertidal culture (e.g., rope, zip ties, etc.) is. Hence, loss of gear and debris is expected to be negligible and not significant. The project involves only minimal ground disturbance and therefore there is little risk of resuspension of dioxins.

Response to Comment BK-7

As noted in Section 2.2 of the DEIR, known marine mammal haul out areas are avoided by the project.

Response to Comment BK-8

The project is not sited near Sand Island or similar nesting habitat, no effects to nesting birds are anticipated.

Response to Comment BK-9

Shorebird use of the subtidal areas is minimal and this comment primarily relates to intertidal areas. With adoption of Alternative 1 (see Master Response 1) which only includes subtidal culture, shorebirds would not be affected by the project.

Response to Comment BK-10

The DEIR does analyze cumulative effects.

Response to Comment BK-11

No response is necessary because specific concerns or information related to the contents of the DEIR is not provided.

Response to Comment MB-1

The topics noted by the comment are addressed in detail in the DEIR and environmental effects were found to be less than significant based on the established thresholds of significance. The comment does not provide any material new information for consideration.

Response to Comment CCC-1

No response is necessary because specific concerns or information related to the contents of the DEIR is not provided.

Response to Comment CCC-2

The District manages many tideland leases as well as boat slips and storage areas in and adjacent to Humboldt Bay. While the District appreciates there could be benefits to having specific triggers for enforcement based on the type, magnitude and/or frequency of non-compliance with lease requirements, we have found that the nature of infractions is case specific and it would be difficult (if not impossible) to identify every type of infraction that might occur. Hence, as described in the EIR, the District will maintain broad discretion over the lease activities, including the right to revoke leases. This type of broad authority is adequate to ensure that lease and permit obligations are being met and to avoid significant environmental impacts as defined by the thresholds of significance in the DEIR.

Response to Comment CCC-3

For intertidal culture, which can occur over hundreds of acres, we agree that cleanup of culture equipment and related debris (shells, etc.) is labor and capital intensive. The examples referenced by the commenter are likely for intertidal culture, for example in Drakes Estero, California where many acres of culture was recently removed. However, the EIR alternative being considered for adoption (Alternative 1) only involves subtidal culture (see Master Response 1). Cleanup of subtidal culture equipment and debris is not trivial, but is much simpler than what is involved for intertidal culture. Cleanup for subtidal culture consists of removing any anchors, anchor lines and the raft structures, as well as any debris. Costing this would not require a quote from a salvage company as suggested in the comment. Indeed, most of what would be removed from the bay would have retained value and therefore the mariculturists would have motivation to remove it.

Response to Comment CCC-4

The District will assume ultimate responsibility for assuring clean up. To reflect this, the following underlined language was added to Section 1 of the EIR:

"In the event that a culture site is to be abandoned, all culture equipment, including broken equipment as well as cultured organisms (attached and dislodged) will be removed. To ensure there is funding for this to occur, prior to finalization of a lease, potential Lessees will be required to provide financial assurances for removal. Financial assurances can be provided in the form of performance bonds, letters of credit, or other financial instruments. The estimated cost of cleanup will be developed by the lessee and approved by the District. <u>The District will assume the ultimate responsibility for cleanup if financial assurances are not adequate or if the lessee is not otherwise fulfilling their obligation for the cleanup."</u>

Response to Comment CCC-5

To provide clarity regarding the extent of required cleanup, the following underlined language was added to Section 1 of the EIR:

"In the event that a culture site is to be abandoned, all culture equipment, including broken equipment as well as cultured organisms (attached and dislodged) will be removed. To help enforce cleanup of equipment that has become dislodged, it will be required that all culture equipment be labeled with the equipment owner's name, unless this cannot be reasonably done (e.g., it would not be reasonable to label a screw). Surveys for debris (including dislodged shells) will be required within all abandoned culture areas and within 100' of every abandoned culture area and all debris must be removed. An exception will be made for shells that are completely buried. The District (or a District contractor) will conduct a post clean up survey to ensure that cleanup was consistent with the requirements of this DEIR, with further cleanup and post clean up surveys implemented as necessary…"

Response to Comment CCC-6

Appendix D was added to the EIR, which describes the site selection process.

Response to Comment CCC-7

In response to this comment, the following underlined language was added to Section 1 of the EIR:

Each Lessee will provide an annual report to the Harbor District. This report will describe the culture site's current status of operations, production, culture methods and relationship to the thresholds described below and all other lease requirements. The reports will include an assessment of the originally proposed culture operations versus existing ("as built") conditions (including a description of location, methods, equipment and any other pertinent information). The reports will also document the state of operations and upkeep on the site, including the presence of discarded, broken or abandoned tools, gear or equipment. Reports will also include representative site photographs. As requested, the Harbor District will provide copies of the annual reports to staff from all permitting agencies, agencies commenting on this DEIR, and any other interested agency.

Response to Comment CCC-8

These comments are only related to intertidal culture sites, which are not being proposed for adoption. See Master Response 1.

Response to Comment CCC-9

Typically, farmers will want to use all the available space on rafts for culture, not storage of equipment. If they opt to store equipment on the permitted raft structures, that would not create a new potential environmental effect. However, long term (overnight) mooring of vessels or barges would increase over water cover created by the project and therefore needs to be accounted for in the environmental analysis. To account for this, the underlined text below was added to Section 3 of the EIR.

Table 1. Site Specific Culture Characteristic Thresholds for Subtidal Sites

Site	Acres	Allowed Surface Area (ft^2) of Water that Can be in Mariculture Production	Allowed Volume (ft^3) of Mariculture Equipment and Cultured Organisms	Allowed Benthic Footprint (ft^2)	Allowed Biomass of Shellfish (Dry weight kg)
Subtidal 1	3.9	24,656	75,493	398	383
Subtidal 2	8.6	54,370	166,472	878	845
Subtidal 3	8.7	55,002	168,408	887	855

Note: Boats or barges that will be moored over night at a site must be included in the calculation of surface area that is in "mariculture production". Such boats or barges must be itemized by size (surface area over water) in the site descriptions and leases described in Section 1. The surface area of boats or barges that are moored overnight combined with the surface area of all other structures cannot exceed the thresholds in this table.

Response to Comment CCC-10

See Master Response 2.

Response to Comment CCC-11

Yes, these tables are in reference to all types of proposed subtidal culture.

Response to Comment CCC-12

See Master Response 2.

Response to Comment CCC-13

Leases will only be granted to shellfish growers with demonstrated experience. Hence, the estimates for worker activity levels are expected to be applicable for all lessees.

Response to Comment CCC-14

This is not a discrepancy. The tables are simply depicting estimates for activity at individual culture units not groups of units (e.g., individual rafts not groups of rafts).

Response to Comment CCC-15

(a) Long term effects to benthic habitat are evaluated in DEIR IMPACT BIO-19. Notably, benthic habitat is displaced, but the extent of displacement is so small (i.e., all displacement by the project is less than .026% of Arcata Bay) that it is found to be less than significant.

(b) The DEIR does not select a specific mooring type. Rather, as described in DEIR Section 1 and Master Response 2, the project seeks to allow for flexibility in culture methods (including mooring) to allow for adaptation and innovation of the shellfish culture industry through time. To allow for this, the environmental analysis is largely based on thresholds for environmental impacts (e.g., maximum extent of benthic footprint).

(c)-(e) To incorporate the information requested in the comment, the text of MITIGATION BIO-10 and MITIGATION BIO-11 was replaced with the following underlined text:

"MITIGATION BIO-10: Sound threshold criteria. This mitigation measure will allow for consistency with noise criteria developed by the Fisheries Hydroacoustic Working Group (FHWG 2008) to protect fish from

injury. To achieve these criteria, vibratory pile installation, noise attenuation devices, limits on daily activity and other Project components will be used.

Criteria to protect fish from injury are as follows, these are the thresholds established for fish injury by the Fisheries Hydroacoustic Working Group (FHWG 2008):

- A cumulative sound exposure level of 183 dB re: 1uPa2*sec as measured 10 m from the source shall not be exceeded, and

- Peak sound pressure of 206 dB re: $1uPa_{peak}$ as measured 10 m from the source shall not be exceeded.

MITIGATION BIO-11: Biological monitor. A biological monitor shall be on-site during pile installation to determine if special status bird and/or marine mammal species are displaying avoidance behavior or other signs of being negatively affected by the pile installation activities. If this occurs then pile installation shall cease until the bird or marine mammal species are no longer in close enough proximity to the operations to be effected.

Additionally, to insure injury or harassment does not occur to marine mammals, hydroacoustic monitoring of the first five piles installed will be conducted to determine the distance from pile installation at which underwater sound levels caused by installation reach 120 dB_{rms} (if vibratory installation methods are used) or 160 dB_{rms} (if driving installation methods are used). These are the thresholds for disturbance to marine mammals established by NMFS (2012). A biological monitor will be onsite and if a marine mammal comes within the distance that would cause disturbance based on these thresholds, then pile installation will cease until the animal moves to a distance where disturbance would not occur.

Additionally, based on the work of Lucke (2009), harbor porpoises may have higher sensitivity to sound disturbance than other marine mammals. Lucke (2009) suggests that harbor porpoises may swim away from sound at lower levels than the thresholds described above. The implications of moving away from a sound differ depending on site specific information (e.g., location of food sources). For the project, a precautionary approach will be taken and pile installation activities will not occur while a harbor porpoise is in the line of sight of the biological monitor. However, further analysis is necessary to determine if this is an appropriate or necessary mitigation measure for other pile installation activities.

With these mitigation measures, any impacts to fish, birds or marine mammals are expected to be minimal and this impact is considered less than significant with mitigation."

(f) As described in the DEIR, MITIGATION BIO-10 requires that a biological monitor is onsite during pile installation and shall cease installation if special status birds show any sign of disturbance. This is adequate to reduce the potential effect to less than significant.

Response to Comment CCC-16

This comment refers only to the intertidal cultures sites, which are not being proposed for adoption. See Master Response 1.

Response to Comment CCC-17

We disagree that birds or marine mammals on the rafts would increase predatory risk to special status fish species. For this to occur, at least one of the following two conditions would need to exist:

(1) **Bird roosting or marine mammal haul out habitat in Humboldt Bay is limited and increasing these habitats increases the population of predatory birds or marine mammals.** There is no indication that this is the case and it is apparent that roosting and haul out habitat in the bay has already been increased by the presence of artificial structures in the bay (e.g., piles and docks).

(2) **The created bird roosting or marine mammal haul out habitat is in an area where the abundance of special status fish species is expected to be relatively high.** This is not the case. The nearest stream from the subtidal sites where salmonids and long-fin smelt spawn (Freshwater Creek) is approximately two miles away and further for a swimming fish given the location of islands between Freshwater Creek and the project sites. The deep water, high salinity habitat of the subtidal sites isn't considered an area where special status fish species would congregate.

Disturbance to marine mammals and other wildlife is addressed in DEIR IMPACT BIO-4 and found not to be significant. The comment does not provide new information to change this assessment.

Entanglement of marine mammals or other wildlife is unlikely, assuming that growers follow best management practices with regards to stowing gear and removing waste from sites. To help ensure this, the following underlined language was added to MITIGATION – BIO-1: Educational Meetings

"During these meetings, farmers will also be directed to properly stow any gear and remove any trash or debris from the bay (including on raft structures) so as to avoid potential entanglement of fish or marine mammal species that may be on or near culture equipment."

Response to Comment CCC-18

Most work will occur during daytime hours. However, under some circumstances, evening work would occur. For example, to satisfy near term product orders or to repair equipment. This is not expected to have a significant environmental effect with inclusion of MITIGATION BIO-2.

Response to Comment CCC-19

This comment primarily relates to intertidal culture which would occur in areas with relatively abundant eelgrass. However, Alternative 1 is being adopted, which only involves subtidal culture (see Master Response 1). The subtidal culture will occur in areas too deep to support eelgrass. Similarly, boating associated with the subtidal culture will occur in areas too deep to support eelgrass.

Response to Comment CCC-20

In response to this comment, the following underlined language was added to Mitigation BIO-6 in the EIR:

1. Approach velocity shall not exceed 0.2 ft per second for self-cleaning screens or 0.05 ft per second for non-self-cleaning screens. Self cleaning screens must achieve full clearance of the entire screen at least once every five minutes.

Response to Comment CCC-21

This comment only relates to intertidal culture. Subtidal culture areas are already too deep for eelgrass to grow and so sea level rise will only make them less suitable for eelgrass growth. The alternative being considered for adoption only includes subtidal culture (See Master Response 1).

Response to Comment CCC-22

This comment primarily relates to intertidal culture which was proposed in close proximity to known herring spawning areas. However, the alternative being considered for adoption only includes subtidal culture (See Master Response 1). It is possible that herring would spawn on the subtidal culture equipment. However, because of the relatively small surface area of this equipment and its location away from known herring spawning areas, the effect on herring is negligible and less than significant.

Response to Comment CCC-23

The alternative being considered for adoption only includes subtidal culture (See Master Response 1). Sub-tidal culture will only consist of nurseries (maturation of shellfish seed) and will not grow shellfish to a reproductive size / age. Hence, the increased risk of naturalization created by the alternative being considered is negligible and less than significant.

Response to Comment CCC-24

This comment primarily refers to loss of culture equipment associated with intertidal culture. The alternative being considered for adoption only includes the subtidal culture sites. See Master Response 1. However, there is some minor potential for equipment to be lost from the proposed subtidal culture operations. This would occur if equipment falls off of raft structures or boats. Mariculturists have financial incentive not to allow for equipment loss and for subtidal culture operations it is easy to protect equipment from loss (e.g., tie it down). Any loss is expected to be very minor. There is not potential for a significant impact associated with loss of equipment from subtidal culture operations.

Response to Comment CCC-25

The direct effects to water oriented recreation are not direct effects to the environment and don't require analysis under CEQA. In some cases, a project's effects on recreation can have indirect effects to the environment and these effects must be analyzed. No such effects were identified in the DEIR or in this comment.

Response to Comment CCC-26

The proposed pile driving is in an industrial area away from any sensitive receptors. No restrictions on pile installation are needed to address noise effects to humans. Other information regarding sound generation of pile installation is included in EIR IMPACT BIO-19. MITIGATION BIO-10 AND MITIGATION BIO-11.

Response to Comment CCC-27

The alternative being considered for adoption only includes subtidal culture (See Master Response 1). The subtidal culture is proposed adjacent to existing docks, piles and other infrastructure and land that is zoned for industrial uses, some of which has current industrial uses and some which does not. No further analysis is needed to determine that the thresholds of significance are not exceeded.

Response to Comment CCC-28

The comment suggests the analysis of three specific alternatives:

1) Alternatives to the use of industrial rubber bands.
    a. Response: The industrial rubber bands would be used for intertidal culture equipment. However, the alternative being considered for adoption only involves subtidal cutlure (See Master Response 1). Hence, this part of the comment does not pertain to the project being considered for adoption.
2) Reconfiguration of project sites to avoid mapped dense eelgrass.
    a. Response: The alternative being considered for adoption (See Master Response 1) does avoid all mapped dense eelgrass.
3) A mooring alternative that would avoid the proposed permanent placement of piles by pile driving.
    a. Response: As described in Alternative 2, the project is attempting to maintain flexibility for private shellfish growers that would lease the sites. As such, final decisions regarding mooring systems have not been made. If multiple lessees are at Subtidal Site 3 then the use

of piles could reduce the overall mooring footprint, because more equipment could be attached to individual piles than individual anchors (for example). This would reduce environmental effects associated with the size of the benthic footprint, but there would be temporary environmental effects associated with pile installation. These tradeoffs will need to be considered during the development and implementation of culture descriptions (see EIR Section 1).

Response to Comment DFW-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment DFW-2

The comment states that the mitigation measures do not adequately reduce impacts to less than significant. However, there is not an indication of the specific impact the Department believes is significant or what CEQA threshold of significance would be exceeded. Similarly, the comment states that cumulative impacts were not adequately addressed, but does not state any specific analysis that is missing or inadequate. Without the specific information described above, it is not possible to develop a detailed response to this comment. We believe that the findings in the DEIR are founded.

Response to Comment DFW-3

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment DFW-4

We disagree that the project would impact 10% of the dense eelgrass in north Humboldt Bay. Although this amount of eelgrass may fall within project boundaries, there are mitigation measures in the DEIR (particularly MITIGATION BIO 3-5) that will result in avoidance and minimization of impacts.

Response to Comment DFW-5

The comment references policies that are related to no net loss of wetlands. However, the project's minor impacts to eelgrass plants don't equate to a loss of wetlands. As described throughout the DEIR, some of the wetland functions will change (e.g., some species will benefit from the addition of shellfish culture and some will be impacted), however no impact was found to be significant with mitigation.

Response to Comment DFW-6

The District has not formed a formal multi-agency working group, but has consulted with each of the agencies referenced. Formation of a formal working group is not necessary to reduce potential project impacts to less than significant.

Response to Comment DFW-7

The comment does not provide any justification as to why a 10 ft buffer should be applied between eelgrass plants and aquaculture gear. With such a buffer, very little of the existing shellfish culture in the bay could continue and expansion would likely be infeasible. The EIR's described buffer of 1 m will substantially avoid and minimize eelgrass impacts and allow for attainment of project goals.

Response to Comment DFW-8

In response to this comment, the following underlined language was added to MITIGATION BIO-4.

MITIGATION BIO-4: Eelgrass avoidance of culture equipment. Prior to placement of shellfish culture equipment, eelgrass will be mapped and a 1-meter buffer will be placed around eelgrass plants. Shellfish culture will not occur within these areas. At intertidal sites, aquaculture equipment will only be placed in un-vegetated areas during the months of July and August, when eelgrass is at its maximum extent to ensure avoidance of eelgrass habitat. Equipment placed at the subtidal sites will be placed to ensure eelgrass is not directly impacted or shaded. Designs to avoid eelgrass will be submitted to the Department prior to placing equipment.

With the incorporated mitigation measures, impacts to eelgrass are expected to be minimal and less than significant and therefore no ongoing monitoring is proposed.

Response to Comment DFW-9

Zostera japonica is limited to intertidal areas of the project. However, only the subtidal parts of the project are being considered for adoption (see Master Response 1). Hence, the spread of this non-native plant species is not expected to occur as a result of the project.

Response to Comment DFW-10

Only the subtidal sites are being considered for adoption (see Master Response 1). These sites are not important for black brant feeding, loafing or gritting. Additionally, boat movement to access the subtidal sites would not be in close proximity to areas utilized by black brant. Potential impacts to black brant are less than significant.

Response to Comment DFW-11

This comment is referencing intertidal areas, however only the subtidal sites are being considered for adoption (see Master Response 1). No impacts to mudflats are expected.

Response to Comment DFW-12

Shorebird use as described in the comment is primarily within intertidal areas. However, only subtidal sites are being considered for adoption (see Master Response 1). Any potential impacts to shorebirds are expected to be negligible and insignificant.

Response to Comment DFW-13

The comment does not present any new impact that was not considered in the DEIR. Additionally, the comment does not describe any flaw in the DEIR's reasoning nor recommend any different analysis. The comment vaguely states that further avoidance, minimization and mitigation measures should be developed. However, it is not described why such measures are needed to reduce impacts to less than significant. With existing described mitigation measures the project is expected to have a less than significant impact.

Response to Comment DFW-14

As described in the DEIR, the project could create 1.9 acres of overwater structure, which is only .09% of the subtidal area in Arcata Bay. The docks are adjacent to a dredged channel with strong current action in an industrial part of the bay. The comment suggests reducing the project footprint to reduce impacts to less than significant, but there is no suggestion of what size footprint would be less than significant or why. As detailed in the DEIR, the proposed footprint would have less than significant impacts; a revised footprint is not proposed.

Response to Comment DFW-15

This type of potential impact was analyzed in the DEIR Carrying Capacity Analysis (see Appendix A, note that the analysis was updated in the FEIR) and found not to be a significant impact. The comment doesn't provide any information to the contrary.

Response to Comment DFW-16

The comment's interpretation of the carrying capacity model used in the analysis (Gibbs 2007) is inaccurate. The *Clearance Efficiency* indicator does not consider abundance of phytoplankton. Additionally, as described by Gibbs (2007) "…no single indicator on its own will provide all the required information and hence multiple indicators are necessary". As described in the project's carrying capacity analysis (Appendix A), when considered together the conclusion is that Humboldt Bay is highly productive for its size and this productivity can withstand a substantial cultured shellfish density without affecting food resources available for other organisms in the bay.

Response to Comment DFW-17

Appropriately, the Gibbs (2007) model is based on annual averages of input parameters. Seasonal data (for example, for primary production) is not available to run the model with the suggested seasonal / temporal aspect.

Response to Comment DFW-18

It is unknown how carrying capacity will change as the result of climate change. Most permits associated with the project are for 10 years or less and carrying capacity may need to be reassessed at those times. Also, there is not a specific method for estimating error for the Gibbs (2007) indicators. The best available information is input into the model and the results are useful for assessing potential project effects on carrying capacity. We were not able to develop specific quantitative thresholds of significance for the indicators, particularly because all indicators must be taken into account collectively, along with our other knowledge of the bay, to develop an overall understanding of potential impacts to carrying capacity.

Response to Comment DFW-19

This comment is only related to the project's intertidal sites, but only the subtidal sites are being considered for adoption (see Master Response 1).

Response to Comment DFW-20

Such studies would be beneficial, but are not necessary to make the required CEQA findings, as detailed in the EIR.

Response to Comment DFW-21

Macroalgae culture would be a subtidal method that would only take place at the identified subtidal sites (i.e., Subtidal Site 1, 2 and/or 3).

Also, in response to the comment, the following underlined language was added to Table 1 of the EIR, which depicts the agencies expected to use this DEIR in their decision making processes and the related environmental laws, approvals, permits and/or consultations.

California Department of Fish and Wildlife	California Endangered Species Act and California Fish and Game Code Section 1802	Primarily through consultation with the California Coastal Commission
	California Fish and Game Code Macroalgae Harvesting License	For collection of macroalgae for culture at the subtidal sites

Response to Comment DFW-22

The DEIR does consider all reasonably foreseeable aquaculture projects in Humboldt Bay.

As described in the DEIR, there are over 900 acres of underutilized land adjacent to Humboldt Bay that are zoned appropriately for mariculture uses (Coastal Dependent Industrial zoning). These lands are public and private. The project would provide in-bay opportunities for private shellfish growers, but the growers have options beyond the District's control regarding any upland component of their operations. Because so much upland area was developed and abandoned by the wood product industry, there is ample infrastructure (e.g., roads, water, buildings, etc.) to accommodate growth in the mariculture industry. Certainly, the industry will require some minor infrastructure changes, but the specific types and location of these changes cannot be predicted at this time. As such, the potential environmental effects of these uses cannot be fully analyzed. Because areas are already developed (e.g., have roads, buildings, etc.) and increased mariculture activities are not expected to reach the levels of intensity (e.g., numbers of people, truck trips, etc.) that they were historically, environmental effects are expected to be minor.

Response to Comment DFW-23

Potential effects to shorebirds, sturgeon and longfin smelt are assessed in the DEIR and found to be less than significant. The comment indicates that cumulative impacts need to be more thoroughly evaluated, but does not provide any indication of how the evaluation could be improved or what is lacking in the current evaluation. The existing evaluation in the EIR is adequate.

Response to Comment DFW-24

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment CE-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment Frazer-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment Frazer-2

A need for avian monitoring was not identified in the DEIR, because there is existing information to support the DEIR's conclusions. However, notably, with adoption of Alternative 1, which only includes the project's subtidal sites (see Master Response 1) any potential effects would be substantially less than those evaluated in the DEIR and less than significant.

Response to Comment Frazer-3

The DEIR does include a cumulative environmental analysis of all reasonably foreseeable projects, including the referenced Coast Seafoods Co. project.

Response to Comment Frazer-4

The maximum potential for mariculture in Humboldt Bay has not been determined and this determination is not needed in order to evaluate the potential environmental effects of the project and other reasonably foreseeable projects.

As noted in the comment, sea level rise may change the location and extent of eelgrass and other habitats. Alternative 1, which only includes the project's subtidal sites, is being considered for adoption (see Master Response 1). These subtidal sites are expected to get deeper, but they are already too deep for eelgrass to grow or for significant light to penetrate to the bay floor, so any habitat change at these sites is expected to be minor.

Response to Comment Frazer-5

This comment is in reference to the project's intertidal sites. However, only the subtidal sites are being considered for adoption (see Master Response 1).

Response to Comment Grantham-1

This comment is in reference to recreational use of intertidal parts of the proposed project. However, only subtidal sites are being proposed for adoption (see Master Response 1).

Response to Comment HIOC-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment HIOC-2

As noted in the DEIR, MITIGATION BIO-9 is only proposed as a precautionary measure. The DEIR's mitigation measures do not apply to other projects.

Response to Comment LEE-1

Yes, this is particularly addressed in DEIR IMPACT BIO-8 and Appendix C.

Response to Comment PO-1

This comment is related to intertidal sites in Humboldt Bay that are important to black brant and other recreationally important species. However, only the subtidal sites of the project are being considered for adoption (see Master Response 1).

Response to Comment Peters-1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to Comment Peters-2

Expanding tidelands would be beneficial. These statements don't raise concern or questions about the specific analysis in the DEIR.

Response to Comment Peters-3

No response is necessary because the comment does not provide specific enough information to inform or improve the EIR's environmental analysis.

Response to Comment Peters-4

This comment is related to intertidal sites in Humboldt Bay that are important to black brant and other recreationally important species. However, only the subtidal sites of the project are being considered for adoption (see Master Response 1).

Response to Comment Peters-5

Impacts on primary and secondary production in the bay are considered in EIR IMPACT BIO-8 and Appendix C (Carrying Capacity Analysis). Impacts were found to be less than significant. The comment does not provide specific enough information to inform or improve the EIR's environmental analysis.

Response to Comment Peters-6

No response is necessary because the comment does not provide specific enough information to inform or improve the EIR's environmental analysis.

Response to Comment Romo - 1

No response is necessary because the comment does not provide specific enough information to inform or improve the EIR's environmental analysis.

Response to CDPH - 1

No response is necessary because no issues related to the adequacy of the environmental impact analysis in the DEIR were raised.

Response to CDPH - 2

Only the subtidal sites of the project are being considered for adoption (see Master Response 1). The subtidal sites would provide a nursery area for the maturation of seed. The seed would be grown to market size in other parts of Humboldt Bay or in entirely different water bodies. It is primarily shellfish growth at these later stages of development ("grow-out") that would affect the potential for contaminants in the shellfish meat. Additionally, the entities conducting the grow-out assume responsibility for ensuring that the product is safe for human consumption. Hence, the project, as proposed for adoption, is not considered to create a human health risk through potential contamination of shellfish meat.

Response to Comment Todoroff - 1

The comment is related to project effects in intertidal areas, particularly to eelgrass and black brant. The project, as proposed for adoption, only includes subtidal sites (see Master Response 1). Hence, potential impacts referenced by the comment are not expected to occur.

Response to Comment Allen - 1

This comment is related to intertidal sites. However, only the subtidal sites of the project are being considered for adoption (see Master Response 1). Hence, no response is necessary.

Response to Comment HSU - 1

This comment is related to intertidal sites. However, only the subtidal sites of the project are being considered for adoption (see Master Response 1). Hence, no response is necessary.

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Section 3 Mitigation Monitoring and Reporting Program

Mitigation Monitoring / Reporting Program

(MMRP)

HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT

This Mitigation Monitoring/Reporting Program (MMRP) has been prepared for the project described below in conformance with Section 21081.6 of the California Environmental Quality Act (CEQA) and Section 15097 of the CEQA Guidelines and was adopted by the Humboldt Bay Harbor, Recreation and Conservation District Board of Commissioners on _____.

PROJECT TITLE: Humboldt Bay Mariculture Pre-Permitting Project

STATE CLEARINGHOUSE NUMBER: 2013062068

LEAD AGENCY: Humboldt Bay Harbor, Recreation and Conservation District (HBHRCD), 601 Startare Drive, Eureka, CA 95501

PROJECT LOCATION: Humboldt Bay, California.

GENERAL PLAN LAND USE DESIGNATION: Industrial / Coastal Dependent

ZONING: Industrial / Coastal Dependent (Combining Zone: Archaeological Resource Area)

PROJECT DESCRIPTION: The Project's objective and purpose is to allow for an expansion of commercial mariculture activities in Humboldt Bay, to create jobs and improve the local economy, while also increasing local and sustainable seafood production. The adopted Project consists of three subtidal sites where culture of Kumamoto oysters (*Crassostrea sikamea*), Pacific oysters (*C. gigas*) and Manila clams (*Tapes philippinarum*) could occur. Additionally, at the subtidal sites, culture of native red macroalgae (Rhodophyta) could occur (for example, culture of *Chondracanthus*, *Gracilaria*, *Palmaria* and *Porphyra*).

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INTRODUCTION: The purpose of this MMRP is to ensure that the mitigation measures adopted in connection with project approval are effectively implemented. This MMRP establishes the framework that HBHRCD and others will use to implement the adopted migration measures and the monitoring and/or reporting of such implementation.

ENFORCEMENT: In accordance with CEQA, the primary responsibility for making a determination with respect to potential environmental effects rests with HBHRCD. As such, HBHRCD is identified as the primary enforcement agency for this MMRP. The District shall ensure that language assuring compliance shall be incorporated into design and contract documents prepared for the project.

PROGRAM MODIFICATION: After adoption of this MMRP, minor changes to this MMRP are permitted but can only be made by HBHRCD. The Harbor District Planner, after consultation with affected Departments or Agencies, may make minor modifications to this MMRP. If, for any reason, any mitigation measure specified in this MMRP cannot be implemented due to factors beyond the control of HBHRCD, at a

noticed public hearing before the HBHRCD Board of Commissioners substitution of another mitigation measure may be approved. In no case shall deviations from this MMRP be permitted unless this MMRP continues to satisfy the requirements of Section 21081.6 of CEQA, as determined by HBHRCD.

MMRP IMPLEMENTATION TABLE: To assure that this MMRP is effectively implemented the table on the following pages establishes the framework that HBHRCD and others will use to implement the adopted migration measures and the monitoring and/or reporting of such implementation.

Mitigation Measure	Responsibility for Implementation	Timing of Implementation	Responsibility for Confirming Completion
AQ-1: Compliance with air quality regulations. Lessees shall consult with AQMD with respect to the requirements of adopted AQMD regulatory plans and shall comply with the requirements of all adopted air quality plans, including plans covering particulate emissions, and shall implement all actions required by AQMD. This mitigation measure will be incorporated into the District's lease requirements for Lessees.	Lessee	Duration of project	HBHRCD
BIO-1: Educational meetings. The District will require farmers to hold annual educational meetings with their personnel (which will be described in annual reports) where the following procedures relating to marine mammals will be described. These meetings will describe that when marine mammals are encountered, personnel shall: • Reduce speed and remain at least 100 yards from the animal(s), whether it is on land or in the water. • Provide a safe path of travel for marine mammals that avoids encirclement or entrapment of the animal(s) between the vessel and the shore. • If approached closely by a marine mammal while underway, the operator shall reduce speed, place the vessel in neutral and wait until the animal is observed clear of the vessel before making way. • Avoid sudden direction or speed changes when near marine mammals. • Never approach, touch or feed a marine mammal. During these meetings, farmers will also be directed to properly stow any gear and remove any trash or debris from the bay (including on raft structures) so as to avoid potential entanglement of fish or marine mammal species that may be on or near culture equipment.	Lessee	Duration of project	HBHRCD
BIO-2: Shielding of light fixtures. Only lighting fixtures that are fully shielded and designed to minimize off site glare and avoid on water light spillage will be utilized at night. Motion-sensing lighting will be used to the extent feasible to reduce the amount of time lights are on. Where motion-sensing lighting is not feasible but lights do not need to be on continuously, timers will be installed to	Lessee	Duration of project	HBHRCD

Mitigation Measure	Responsibility for Implementation	Timing of Implementation	Responsibility for Confirming Completion
reduce the amount of unnecessary lighting.			
BIO-3: **Eelgrass avoidance by boats.** Boat traffic will be routed around eelgrass beds to minimize the potential for damage to eelgrass from propellers and hulls. Site descriptions will be prepared for each culture site and will describe boat routes that shellfish farm workers will use to avoid eelgrass.	Lessee	Duration of project	HBHRCD
BIO-4: Eelgrass avoidance of culture equipment. Prior to placement of shellfish culture equipment, eelgrass will be mapped and a 1-meter buffer will be placed around eelgrass plants. Shellfish culture will not occur within these areas. Aquaculture gear will only be placed in un-vegetated areas during the months of July and August, when eelgrass is at its maximum extent to ensure avoidance of eelgrass habitat.	Lessee	Duration of project	HBHRCD
BIO-5: **Deposition of shells.** Shellfish farm operators will not intentionally deposit shells or any other material on the bay floor. Natural deposition of shells and other materials will be minimized to the maximum extent feasible.	Lessee	Duration of project	HBHRCD
BIO-6: Screening criteria. CDFW has developed screening criteria to protect juvenile longfin smelt in bays and estuaries from impingement or entrainment by water intakes. These criteria also allow for protection of juvenile salmonids, as based on criteria developed by NMFS (2008). These criteria, which all water intakes under the Project will maintain, are as follows: 1. Round or square (measured diagonally) openings in intake screens shall not exceed 2.38 millimeters (mm) (3/32 in). 2. Slotted opening in the screen shall not exceed 1.75 mm (0.0689 in). 3. Approach velocity shall not exceed 0.2 ft per second for self-cleaning screens or 0.05 ft per second for non-self-cleaning screens. Self cleaning screens must achieve full clearance of the entire screen at least once every five minutes. 4. Overall screen porosity shall be a minimum of 27%.	Lessee	Duration of project	HBHRCD

Mitigation Measure	Responsibility for Implementation	Timing of Implementation	Responsibility for Confirming Completion
BIO-7: Spawning herring avoidance. During the herring spawning season (December, January and February) shellfish farmers will visually inspect shellfish culture equipment to be worked on prior to harvesting, planting or maintenance to determine if herring have spawned. If herring spawning has occurred then the harvesting, planting or maintenance will be postponed for two weeks on the beds where spawning occurred in order to allow for successful reproduction.	Lessee	Duration of project	HBHRCD
BIO-8: Discard clam culls outside of bay. During washing of seed and equipment, screens will be used to contain all clams regardless of size and any culls will be discarded in locations where they cannot reach coastal waters.	Lessee	Duration of project	HBHRCD
BIO-9: Remove mature clams from bay. All clam seed will be removed from Humboldt Bay prior to reaching 12 mm shell size, at which size they are not yet sexually mature.	Lessee	Duration of project	HBHRCD
BIO-10: Sound threshold criteria. This mitigation measure will allow for consistency with noise criteria developed by the Fisheries Hydroacoustic Working Group (FHWG 2008) to protect fish from injury. To achieve these criteria, vibratory pile installation, noise attenuation devices, limits on daily activity and other Project components will be used. Criteria to protect fish from injury are as follows, these are the thresholds established for fish injury by the Fisheries Hydroacoustic Working Group (FHWG 2008): • A cumulative sound exposure level of 183 dB re: 1uPa2*sec as measured 10 m from the source shall not be exceeded, and • Peak sound pressure of 206 dB re: 1uPapeak as measured 10 m from the source shall not be exceeded.	HBHRCD/Lessee	During construction	HBHRCD
BIO-11: Biological monitor. A biological monitor shall be on-site during pile installation to determine if special status bird and/or marine mammal species are displaying avoidance behavior or other signs of	Qualified biologist hired	During construction	HBHRCD

Mitigation Measure	Responsibility for Implementation	Timing of Implementation	Responsibility for Confirming Completion
being negatively affected by the pile installation activities. If this occurs then pile installation shall cease until the bird or marine mammal species are no longer in close enough proximity to the operations to be effected. Additionally, to insure injury or harassment does not occur to marine mammals, hydroacoustic monitoring of the first five piles installed will be conducted to determine the distance from pile installation at which underwater sound levels caused by installation reach 120 dBrms (if vibratory installation methods are used) or 160 dBrms (if driving installation methods are used). These are the thresholds for disturbance to marine mammals established by NMFS (2012). A biological monitor will be onsite and if a marine mammal comes within the distance that would cause disturbance based on these thresholds, then pile installation will cease until the animal moves to a distance where disturbance would not occur. Additionally, based on the work of Lucke (2009), harbor porpoises may have higher sensitivity to sound disturbance than other marine mammals. Lucke (2009) suggests that harbor porpoises may swim away from sound at lower levels than the thresholds described above. The implications of moving away from a sound differ depending on site specific information (e.g., location of food sources). For the Project, a precautionary approach will be taken and pile installation activities will not occur while a harbor porpoise is in the line of sight of the biological monitor. However, further analysis is necessary to determine if this is an appropriate or necessary mitigation measure for other pile installation activities.	by HBHRCD		
BIO-12: Bio-fouling organism removal. All bio-fouling organism removal operations shall be carried out onshore or on a vessel. All bio-fouling organisms removed during these cleaning operations shall be disposed of at an appropriate upland facility.	Lessee	Duration of project	HBHRCD
CR-1: Protocols for inadvertent discovery of any cultural or archeological resource. The following protocol shall be implemented if a cultural or archeological resource is discovered.	HBHRCD/Lessee	Duration of project	HBHRCD

Mitigation Measure	Responsibility for Implementation	Timing of Implementation	Responsibility for Confirming Completion
1. The party who made the discovery shall be responsible for immediately contacting by telephone the District. 2. Ground-disturbing activities shall be immediately stopped at the find locality if potentially significant historic or archaeological materials are discovered. Examples include, but are not limited to, concentrations of historic artifacts (e.g., bottles, ceramics) or prehistoric artifacts (chipped chert or obsidian, arrow points, groundstone mortars and pestles), culturally altered ash-stained midden soils associated with pre-contact Native American habitation sites, concentrations of fire-altered rock and/or burned or charred organic materials, and historic structure remains such as stone-lined building foundations, wells or privy pits. Ground-disturbing Project activities may continue in other areas that are outside the discovery locale. 3. An "exclusion zone" where unauthorized equipment and personnel are not permitted shall be established (e.g., taped off) around the discovery area plus a reasonable buffer zone by the District, or party who made the discovery. 4. The discovery locale shall be secured (e.g., 24-hour surveillance) as directed by the District if considered prudent to avoid further disturbances. 5. Upon learning about a discovery, the District shall be responsible for immediately contacting by telephone the contacts listed below to initiate the consultation process for its treatment and disposition: a. Tribal Historic Preservation Officers (THPOs) with Blue Lake Rancheria, Bear River Band and Wiyot Tribe; and b. Other applicable agencies involved in Project permitting (e.g., U.S. Army Corps of Engineers [USACE], California Coastal Commission, etc.). 6. In cases where a known or suspected Native American burial or human remains are uncovered, the Humboldt County Coroner (707-445-7242) shall also be notified immediately. 7. Ground-disturbing Project work at the find locality shall be suspended temporarily while the District, THPOs, a consulting archaeologist and other applicable parties consult about appropriate treatment and disposition of the find. Ideally, a treatment plan may be decided within three working days of discovery notification and the field phase of a treatment plan may be accomplished within five days after its approval, however, circumstances may require			

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longer periods for data recovery. Where a project can be modified to avoid disturbing the find, this may be the preferred option. 8. Any and all inadvertent discoveries shall be considered strictly confidential, with information about their location and nature being disclosed only to those with a need to know. The District shall be responsible for coordinating any requests by or contacts to the media about a discovery. 9. Ground-disturbing work at a discovery locale may not be resumed until authorized in writing by the District. 10. Final disposition of all collected archaeological materials shall be documented in a data recovery report and its disposition decided in consultation with Tribal representatives. These protocols shall be requirements contained within District leases to Lessees.			
CR-2. Protocols for inadvertent discovery of Native American remains and grave goods. In the event of a discovery of Native American remains or grave goods, the following protocol would be followed, in addition to the protocol described under Mitigation CR-1. 1. If human remains are encountered, they shall be treated with dignity and respect. Discovery of Native American remains is a very sensitive issue and serious concern of affiliated Native Americans. Information about such a discovery shall be held in confidence by all Project personnel on a need-to-know basis. The rights of Native Americans to practice ceremonial observances on sites, in labs and around artifacts shall be upheld. The preference of the Wiyot area tribes is to leave ancestral burials and remains in situ, and that no photographs or analyses will be made. 2. The Coroner has two working days to examine the remains after being notified of the discovery. If the remains are Native American, the Coroner has 24 hours to notify the NAHC at (916) 653-4082. 3. The NAHC is responsible for identifying and immediately notifying the most likely descendant (MLD) of the deceased Native American. 4. Within 48 hours of their notification by the NAHC, the MLD may recommend the means for	HBHRCD/Lessee	Duration of project	HBHRCD

Mitigation Measure	Responsibility for Implementation	Timing of Implementation	Responsibility for Confirming Completion
treating or disposing, with appropriate dignity, the human remains and any associated grave goods. The recommendation may include the scientific removal and non-destructive or destructive analysis of human remains and items associated with Native American burials. Only those osteological analyses (if any) recommended by the MLD may be considered and carried out. 5. Whenever the NAHC is unable to identify a MLD, or the MLD identified fails to make a recommendation, or the District rejects the recommendation of the MLD and mediation between the parties by NAHC fails to provide measures acceptable to the District, the District shall cause the re-burial of the human remains and associated grave offerings with appropriate dignity at an appropriate nearby location not subject to further subsurface disturbance. 6. These protocols shall be requirements contained within District leases to Lessees.			
CR-3. Training for Lessees operating at Intertidal Sites 3 and 4. Intertidal Sites 3 and 4 have the greatest possibility for inadvertent discovery of archeological and historic resources. Hence, prior to initiating culture at these sites, Lessees will meet with the Wiyot Tribe THPO in order to gain an understanding of the resources that may be disturbed and practical steps for minimizing disturbance.	Lessees/HBHRCD	Prior to initiating culture activities	HBHRCD
WQ-1: Minimize fuel and petroleum spill risks. As part of the District's lease requirements, Lessees will be required to ensure equipment is appropriately maintained to minimize the potential for spills and to be prepared to manage spills, including by maintaining cleanup materials (e.g., absorbent pads) on all vessels. The District will reserve the right to inspect the vessels to ensure compliance with this mitigation measure.	Lessee	Duration of project	HBHRCD

References

[FHWG] Fisheries Hydroacoustic Working Group. 2008. Agreement in Principal for Interim Criteria for Injury to Fish from Pile Driving Activities. Memorandum of Agreement between NOAA Fisheries' Northwest and Soutwest Regions; USFWS Regions 1 and 8; California, Washington and Oregon Departments of Transportation; California Department of Fish and Game; and Federal Highways Administration. 12 June 2008.

Lucke. 2009. Temporary shift in masked hearing thresholds in a harbor porpoise (Phocoena phocoena) after exposure to seismic airgun stimuli. Journal of the Acoustic Society of America 125(6).

[NMFS] National Marine Fisheries Service. 2008. Anadromous Passage Facility Design Criteria. National Marine Fisheries Service, Northwest Region.

[NMFS] National Marine Fisheries Service. 2012. Guidance Document: Sound Propagation Modeling to Characterize Pile Driving Sounds Relevant to Marine Mammals. Memorandum: NMFS Northwest Fisheries Science Center–Conservation Biology Division and Northwest Regional Office–Protected Resources Division. 31 January 2012.