Humboldt Bay
Harbor, Recreation and Conservation District
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Eureka, California 95502-1030

NOTICE OF PREPARATION
OF DRAFT ENVIRONMENTAL IMPACT REPORT FOR REVISED PROJECT
SCH #2017032068

DATE: January 31, 2019

PROJECT TITLE: Humboldt Bay Intertidal Mariculture Pre-Permitting Project and Yeung Oyster Farm

PROJECT LOCATION: North Humboldt Bay, Humboldt County, California

LEAD AGENCY: Humboldt Bay Harbor, Recreation and Conservation District

This notice announces that a Draft Environmental Impact Report (DEIR) is being prepared for the Humboldt Bay Intertidal Mariculture Pre-Permitting Project (Intertidal Pre-Permitting Project) and Yeung Oyster Farm (SCH#2017032068). The two projects will be evaluated in one EIR because they have many similarities including proposed timing, location, shellfish culture methods, culture species, and potential environmental effects. Both projects are within intertidal areas of north Humboldt Bay. The DEIR will identify, evaluate and disclose possible environmental effects of these projects. The Humboldt Bay Harbor, Recreation and Conservation District (Harbor District) is the project proponent for the Intertidal Pre-Permitting Project and Mr. Jerry Yeung is the project proponent for the Yeung Oyster Farm. The Harbor District is the California Environmental Quality Act (CEQA) Lead Agency.

Background: This project has been through several iterations in the past several years, and the current scope is similar in many ways to previous proposals. The largest difference between the current proposed project and the project described in the March 2017 NOP and subsequent Scoping Report (December 2017) are the revised project areas and addition of proposed cultivation area HBHD - 5 (shown on Project Description Figures 1 and 7); other project elements remain similar. The purpose of this notice is to provide interested parties an opportunity to provide responses to scope and content of the EIR as it relates to the revised project. See Attachment A - Project Description for more detailed information on project sites and shellfish culture methods. The 13 comments received in response to the March 2017 NOP and documented in the December 2017 Scoping Report will be considered during Draft EIR preparation and do not need to be resubmitted. An abbreviated project timeline is included below.

January- April 2017: The Harbor District circulated a draft Initial Study / Mitigated Negative Declaration for the Yeung Oyster Farm (SCH#2016122066) but based on public comments the Harbor District determined that an EIR was more appropriate for this project. Hence, the Harbor District determined it is appropriate to develop one EIR for the Intertidal Mariculture Pre-Permitting Project and Yeung Oyster Farm. An NOP was released for this project on March 23, 2017 to solicit DEIR scope input and comments. The District received written comments from 13 entities including three agencies, local interest groups, residents, and non-governmental organizations. The District held a public scoping meeting on April 18, 2017 to hear public comments, and also met with stakeholders and regulatory agency staff. Among other comments, the District received feedback that more detailed mapping of eelgrass (*Zostera marina)* should be completed at the project sites and that project alternatives should be considered which better avoid eelgrass.

May 2017: Detailed eelgrass mapping of the sites was conducted, and project designs were modified to avoid the mapped eelgrass. The mapping results and proposed new lease areas have been incorporated into the Scoping Report, released December 2017, and the revised project description that is now being released.

December 2017: The Harbor District released a scoping report outlining the changes made to the project sites based on public feedback, describing the District's EIR scoping process, and containing comments received on the proposed project during the scoping period.

January 2019: The proposed project has been revised to include updated project areas and a new proposed cultivation area (HBHD-5, shown on Project Description Figures 1 and 7), other project elements remain similar. The 13 comments received in response to the March 2017 NOP will be considered during Draft EIR preparation and do not need to be resubmitted.

Project Summary:
This project is comprised of proposed activities that are described in two separate District permit applications: one for the Humboldt Bay Mariculture Pre-Permitting Project (Pre-Permitting Project) and one for the Yeung Oyster Farm. Although these are separate projects, they have the same goals/objectives and propose oyster farming in Humboldt Bay using similar (or potentially the same) methods. The goal and purpose of both projects is to allow for an expansion of commercial mariculture activities in Humboldt Bay, create jobs and improve the local economy, while also increasing local and sustainable seafood production.

The projects will use the same culture methods and culture the same species (Kumamoto oysters [*Crassostrea sikamea*] and Pacific oysters [*C. Gigas*]). Both of these species are currently cultured in Humboldt Bay. Proposed methods and sites are included in the attached project description. After receiving regulatory approvals for Intertidal Mariculture Pre-Permitting Project sites, the Harbor District will grant leases to private shellfish growers ("Lessees") for discrete portions of these sites. Mr. Yeung will culture oysters on his property and may also lease portions of his property to other growers.

Possible environmental effects:
Because of the potential for significant impacts to the environment, the Harbor District has decided to prepare an EIR. The purpose of an EIR is to inform decision-makers and the general public of the environmental effects of a proposed project. The EIR process is intended to provide information sufficient to evaluate a proposed project and its potential to cause significant effects on the environment; examine methods of reducing adverse environmental impacts; and identify and evaluate alternatives to the proposed project.

Pursuant to Section 15064 of the CEQA Guidelines, the discussion of potential project effects on the environment in the EIR will concentrate on those impacts that the Harbor District has determined may be potentially significant. Based on research by the Harbor District and comments received during circulation of the subtidal Pre-Permitting Project EIR, Yeung Oyster Farm IS/MND, the March 2017 NOP, and other resources, the following environmental resources could potentially be affected by the project:

- Aesthetics
- Air quality
- Biological resources
- Cultural resources
- Hydrology and water quality
- Recreation

Comments on the Notice of Preparation (NOP) must be received no later than 5:00 p.m. Monday, March 4, 2019 (or, if applicable, within 30 days after receipt of the NOP as indicated by certified mail). As stated above, comments received on the March 2017 NOP will be considered during EIR preparation and do not need to be resubmitted.

The NOP and related project documents are available for public review at the Humboldt Bay Harbor, Recreation and Conservation District, 601 Startare Drive, Eureka, CA 95501 and online at: http://humboldtbay.org

Comments regarding the forthcoming EIR must be written and submitted to:

George Williamson, District Planner
601 Startare Drive, Eureka, CA 95501
Telephone: (707) 443-0801
Facsimile: (707) 443-0800
Email: districtplanner@humboldtbay.org

DATE: January 31, 2019

SIGNATURE: 

Attachment A

Project Description including Proposed Sites and Methods for the Intertidal Mariculture Pre-Permitting Project and Yeung Oyster Farm

Project Description

The DEIR will assess potential environmental effects of proposed activities that are described in two separate District permit applications: one for the Humboldt Bay Mariculture Pre-Permitting Project (Pre-Permitting Project) and one for the Yeung Oyster Farm. Although these are separate projects, they have the same goals/objectives and propose oyster farming in Humboldt Bay using similar (or potentially the same) methods. These projects are described below. Collectively, the Pre-Permitting Project and Yeung Oyster Farm Project are referred to as the "Project".

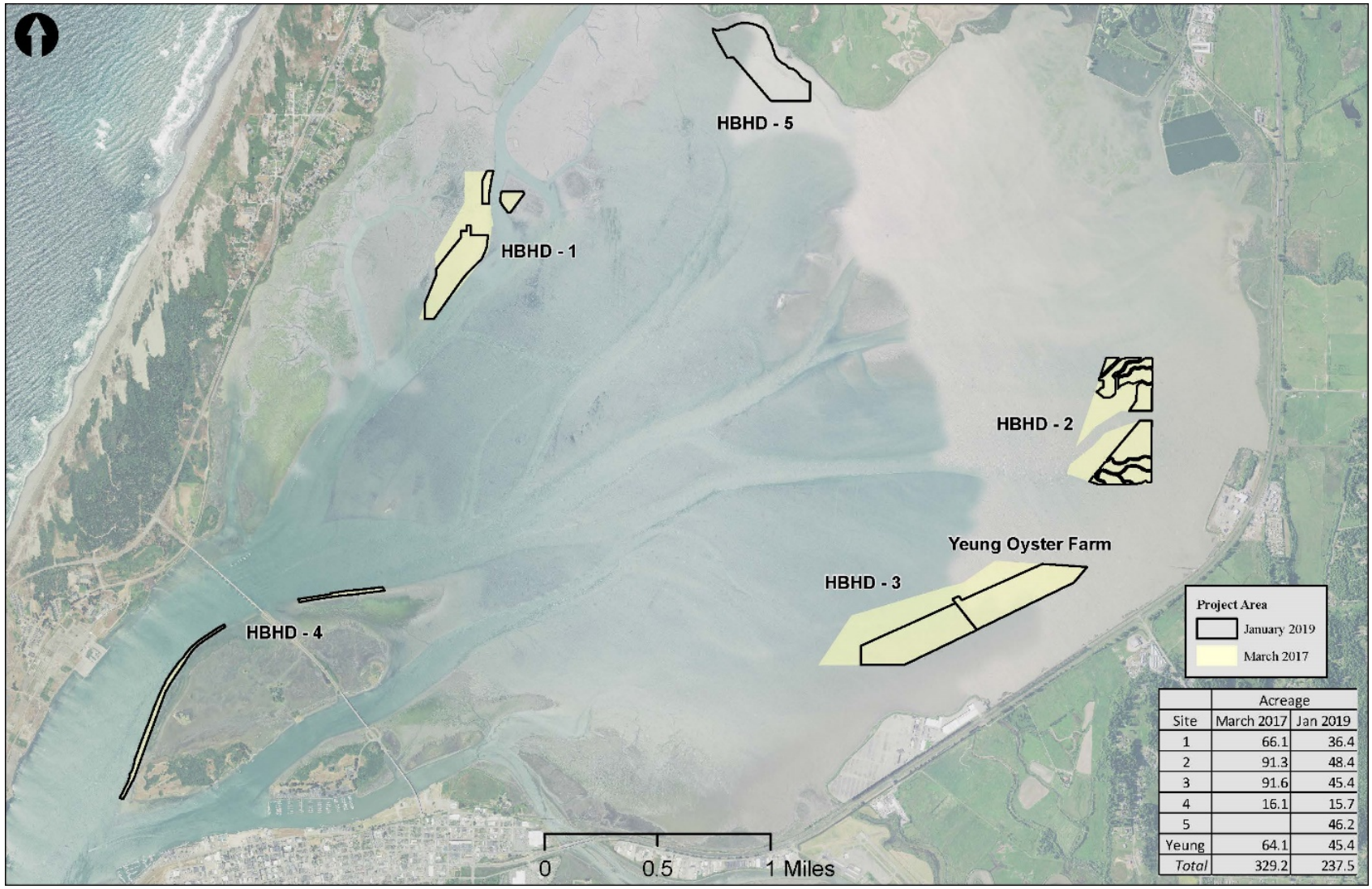
Project Goals and Objectives

The overall Project goal 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 Project is guided by the following objectives that will aid decision makers in their review of the Project and associated environmental impacts:

- To expand mariculture opportunities to meet the increasing demand for these products and regain Humboldt Bay production to compensate for past footprint reductions of mariculture growing areas.
- To create additional job opportunities and sustainable economic development for Humboldt Bay and local jurisdictions.
- To enhance a source of local sustainable seafood and reduce Humboldt County and California's reliance on imported seafood.
- To allow flexible farming plans that can adapt to specific grower operational and management needs, environmental conditions, and site conditions.
- To locate oyster beds in areas with optimal growing conditions to maximize efficiency, while maintaining areas for habitat and recreational uses.

Project Sites

The Project consists of six intertidal sites where culture of Kumamoto oysters (*Crassostrea sikamea*) and/or Pacific oysters (*C. gigas*) could occur. The proposed sites are depicted in Figures 1-7. The area of each individual site of the current project compared to the March 2017 project is shown in the table below, the total area of all sites is approximately 238 acres.



	Acreage	
Site	March 2017	Jan 2019
1	66.1	36.4
2	91.3	48.4
3	91.6	45.4
4	16.1	15.7
5		46.2
Yeung	64.1	45.4
Total	329.2	237.5

Figure 1. Proposed Culture Sites (current project areas compared to March 2017 project areas)

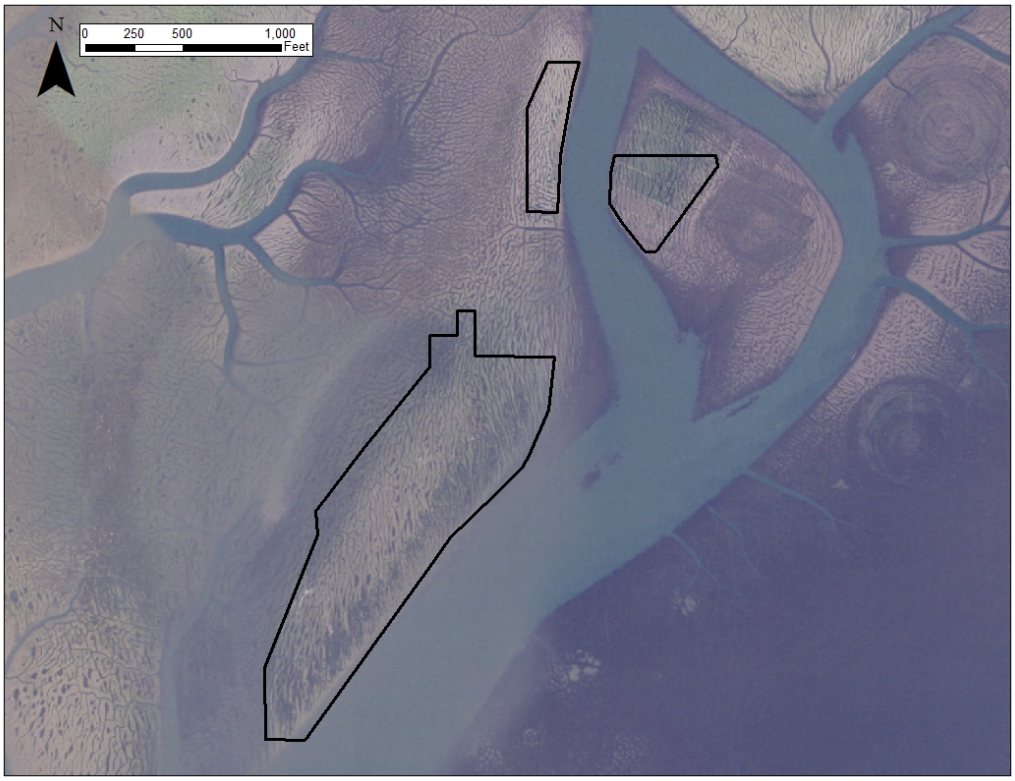


Figure 2. **HBHD 1 Culture Area: approximately 36.4 acres (reduced from 66.1 acres)**

Figure 3. **HBHD 2 Culture Area: approximately 48.4 acres (reduced from 91.3 acres).**

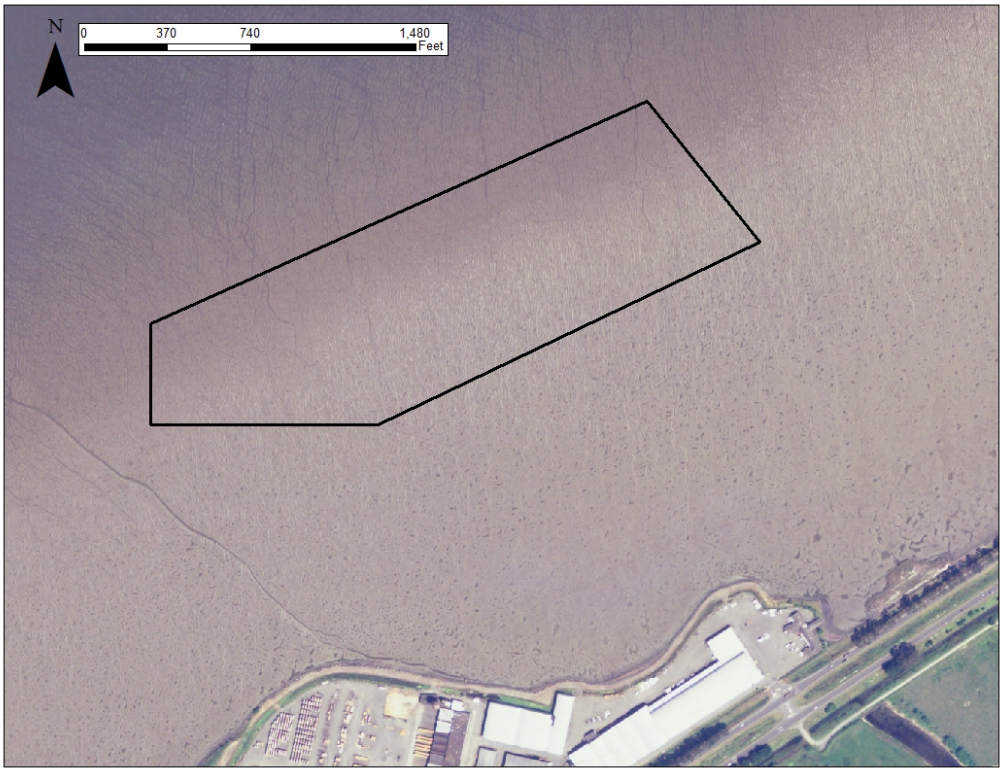


Figure 4. **HBHD 3 Culture Area: approximately 45.4 acres (reduced from 91.6 acres).**

Figure 5. **HBHD 4 Culture Area: approximately 15.7 acres (reduced from 16.1 acres).**

Figure 6. **Yeung Oyster Farm Culture Area: approximately 45.4 acres (reduced from 64.1 acres).**

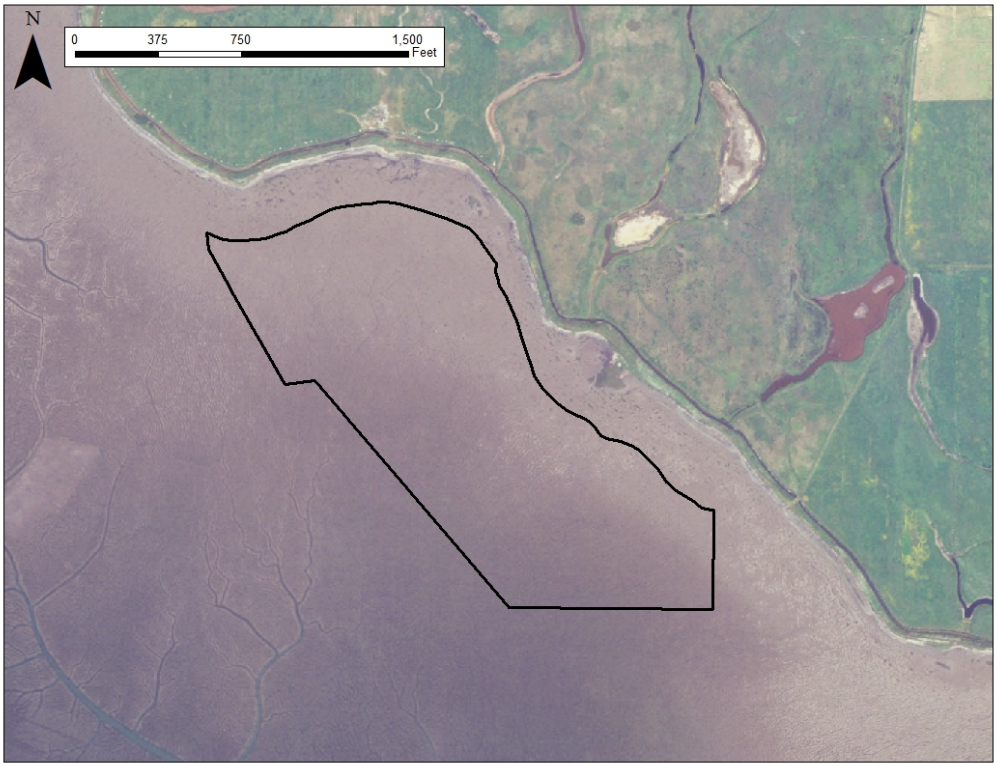


Figure 7. **HBHD 5 Culture Area: approximately 46.2 acres (newly proposed area).**

Methods

The continued success of mariculture in Humboldt Bay will require adaptation of culture methods as new technologies are developed. New methods can result in higher production, improved product quality, and reduced environmental effects. To allow for adaptation of culture methods, the following process was used to develop the Project description:

1. A general Project layout was developed based on the following culture methods. These methods represent the general types of culture that would occur under the Project.
    a. Rack-and-Bag
    b. Cultch-on-Longline
    c. Basket-on-Longline

2. The following culture characteristics were assessed. These culture characteristics are related to specific environmental effects of mariculture (Table 1).
    a. Levels of activity by farm workers
    b. Water surface area occupied by culture equipment and cultured organisms
    c. Volume of culture equipment and cultured organisms
    d. Area of culture equipment in contact with bay bottom (benthic footprint)
    e. Maximum biomass of shellfish soft tissue that could be present at any given time

3. Based on the culture characteristics of each method, thresholds were established for the Projects. Under the Projects, culture can occur within each site as long as it:
    a. Does not exceed these culture characteristic thresholds,
    b. Follows other terms and conditions established by the Project's regulatory approvals including the EIR, and
    c. Does not result in any environmental effects that were not considered under the Project.

If there are environmental effects that were not considered under the Project, then additional regulatory approvals may be required.

Table 1. Culture Characteristics and Related Potential Environmental Effects

Culture Characteristics	Potential Environmental Effect
Levels of activity by farm workers	Environmental effects by farm workers (e.g., trampling, wildlife disturbance)
Water surface area occupied by culture equipment and cultured organisms	Increased shading and overwater cover
Volume of culture equipment under the water line	Effects on currents and sedimentation
Benthic footprint	Reduction in habitat for benthic organisms
Biomass of cultured shellfish	Reduced particulate organic matter as a result of consumption by cultured shellfish

Example Culture Methods

The Project is designed to allow for some flexibility in culture methods. The following culture methods were used to evaluate the potential environmental effects of mariculture and to establish thresholds for certain mariculture characteristics.

Shellfish Culture Rack-and-Bag Method

This description was adapted from Coast Seafoods Company (CSC) (2007)[1]. Rack-and-bag culture is used for growing Kumamoto oysters and Pacific oysters. The oysters are grown as "singles", meaning they are not attached to any structure such as shells or to each-other (they are "loose" in the bags). Rack-and-bag culture uses polyethylene mesh bags and rebar frames. Each rebar frame is 3 feet (ft) x 12 ft and supports 3–6 bags attached to the frame via industrial rubber bands (see Appendix B). Each bag is initially seeded with oysters and placed in intertidal areas. It takes 1–2 years for the seed to grow into oysters of market size, depending on tidal height and primary productivity, and then the bags of oysters are harvested by hand (lifted from the racks into a skiff), processed and brought to market.

Shellfish Culture Cultch-on-Longline Method

This description was adapted from CSC (2007). Cultch-on-longline culture is used for growing Kumamoto oysters and Pacific oysters. Prior to planting in the bay, oyster seed is attached to shells, which are attached to longlines. Planting is accomplished by placing seeded longlines on notched PVC stakes that are arranged in rows on the mudflats. The longlines are strung through notches on top of the PVC stakes, suspending the oyster seed approximately one ft above the bay bottom (see Appendix B).

Longline beds are harvested when they have oysters of a harvestable size and market conditions are right. It usually takes 1.5–3 years for oysters to reach a harvestable size. One of two methods is used to harvest longlines. The first, hand picking, involves placing around 20 bushel tubs on the bed at high tide using an oyster scow. The tubs are then filled at low tide by hand. The picking crew cuts the longline into manageable single clusters and places them in the picking tub. A floating ball is attached to each tub, and at high tide an oyster scow is used to pull the tub out of the water. The oysters are dumped on the deck of the scow, and the tub is placed back on the bed to be refilled.

The second method of harvest, the longline harvester, involves positioning a scow over the longline bed at high tide. Individual lines are then pulled onto the floating scow either by hand or by means of a hydraulically operated roller. If the lines are pulled by hand then the lines need to be cut into individual clusters, usually at the plant. If the lines are pulled mechanically they run through a breaker that strips the clusters from the line. The longline harvester does not come in contact with the bottom while harvesting longlines.

Shellfish Culture Basket-on-Longline Method

Basket-on-longline culture is used to grow Kumamoto oysters and Pacific oysters as singles. This method utilizes baskets that hang off a monofilament line suspended off the bottom using 2 inches (in) schedule 80 PVC pipe. The monofilament line is 5 mm in diameter and protected by a 3/8 in

[1] Coast Seafoods Company. 2007. Coast Seafoods Application for Continued Mariculture Operations in Humboldt Bay, California. Draft Mitigated Negative Declaration. Prepared for Humboldt Bay Harbor, Recreation and Conservation District.

polyethylene sleeve that the monofilament is slid inside (see Appendix B). The baskets are approximately 24 in x 10 in x 6 in and are held on the line with plastic clips. A float, which is approximately 2.5 in diameter and 5.5 in long, is often attached to the baskets so that the baskets float up during high tides. Once the oysters reach a harvestable size, in approximately 1.5–2 years, the baskets are removed from the water, and the oysters are accessed through end caps on the baskets.

Determination of Culture Characteristics

The following processes and assumptions were used to develop an understanding of mariculture characteristics, upon which thresholds for mariculture operations were based.

Environmental Effects by Farmworkers

Farmworkers may have environmental effects when they are working at the culture sites, for example by trampling vegetation or disturbing wildlife. Mr. Greg Dale (CSC operations manager) and Mr. Ted Kuiper (retired shellfish culturist) were interviewed to determine the type and number of visits for each method.

Surface Area

Cultured organisms and associated equipment can affect eelgrass and other habitat features by increasing shade over these features. Overwater structure can also provide habitat for organisms, including plants, birds, fish and invertebrates. The water surface area per acre (ac) occupied by culture equipment and cultured organisms was calculated based on the following assumptions (also see Appendix B):

For rack-and-bag culture:

- Racks are 12 ft x 3 ft and are elevated by six 5/8-inch rebar posts
- Racks are set in groups of 9, with a distance of 3 ft between subgroups of three racks
- Each group of nine racks is 10 ft apart from each other group of nine racks

For cultch-on-longline culture:

- Area is based on measurements of sampled cultch-on-longlines in 2012
- Lines are in groups of 5, with a distance of 2.5 ft between each line
- Each group of five lines is separated by 5 ft within a given row
- Rows are 10 ft apart
- Lines are a maximum of 100 ft, but areas where a 100 ft line won't fit are filled by partial lines
- Lines are elevated by 2-inch PVC posts every 2.5 ft

For basket-on-longline culture:

- Baskets are 24 in x 10 in
- Basket floats are 2.5 in diameter and 5.5 in long
- Lines are in groups of 3, with a distance of 3 ft between each line
- Each group of three lines is separated by 20 ft on all sides
- Lines are a maximum of 100 ft, but areas where a 100 ft line won't fit are filled by partial lines

- Lines are elevated with 2-inch PVC posts every four baskets and line ends are anchored with 1.5 in x 2 in wide galvanized fence posts

Volume

Cultured organisms and associated equipment can alter water currents and sedimentation rates. The overall volume of cultured organisms and associated equipment is a reasonable metric for assessing effects on currents and sedimentation. The volume of each culture method per acre was assessed based on the following assumptions (also see Appendix B).

For rack-and-bag culture:

- Rack dimensions are 12 ft x 3 ft x 0.7 ft
- Racks are set in groups of 9, with a distance of 3 ft between subgroups of three racks
- Each group of nine racks is 10 ft apart from each other group of nine racks

For cultch-on-longline culture:

- Volume of individual lines and associated shellfish is based on measurements taken in 2012
- Lines are in groups of 5, with a distance of 2.5 ft between each line
- Each group of five lines is separated by 5 ft within a given row
- Rows are 10 ft apart
- Lines are a maximum of 100 ft, but areas where a 100 ft line won't fit are filled by partial lines

For basket-on-longline culture:

- Basket dimensions are 24 in x 10 in x 6 in
- Floats are 2.5 in diameter and 5.5 in long
- Lines are in groups of 3, with a distance of 3 ft between each line
- Each group of three lines is separated by 20 ft
- Lines are a maximum of 100 ft, but areas where a 100 ft line won't fit are filled by partial lines

Benthic Footprint

The area of culture equipment in contact with the bay bottom was calculated based on the following:

For rack-and-bag culture:

- Racks are 12 ft x 3 ft and are elevated by six 5/8-inch diameter rebar posts
- Racks are set in groups of 9, with a distance of 3 ft between subgroups of three racks
- Each group of nine racks is 10 ft apart from each other group of 9 racks

For cultch-on-longline culture:

- Lines are elevated by 2-inch PVC posts every 2.5 ft
- Lines are in groups of 5, with a distance of 2.5 ft between each line
- Each group of five lines is separated by 5 ft within a given row
- Rows are 10 ft apart

For basket-on-longline culture:

- Each line holds 40 baskets
- Lines are in groups of 3, with a distance of 3 ft between each line
- Each group of three lines is separated by 20 ft
- Lines are a maximum of 100 ft, but areas where a 100 ft line won't fit are filled by partial lines
- Lines are elevated with 2-inch PVC posts every four baskets and line ends are anchored with 1.5 in x 2 in wide galvanized fence posts

Biomass of Cultured Shellfish

Phytoplankton consumption by cultured shellfish is proportional to the number of shellfish cultured. The shellfish biomass calculations are based on the following:

For rack-and-bag culture:

- Each Rack-and-Bag unit contains six bags per rack, with 2 liters (L) of seed added per bag and periodic subsequent division of that stock into more bags
- Racks are set in groups of 9, with a distance of 3 ft between subgroups of three racks
- Each group of nine racks is 10 ft apart from each other group of nine racks

For cultch-on-longline culture:

- Each 100-ft longline contains 40-100 dozen oysters
- Lines are in groups of 5, with a distance of 2.5 ft between each line
- Each group of five lines is separated by 5 ft within a given row
- Rows are 10 ft apart

For basket-on-longline culture:

- Each basket is planted with 2 L of seed with periodic subsequent division of that stock into more baskets. Each line holds 40 baskets
- Lines are in groups of 3, with a distance of 3 ft between each line
- Each group of three lines is separated by 20 ft
- Lines are a maximum of 100 ft, but areas where a 100 ft line won't fit are filled by partial lines

Results and Thresholds

Based on the information described above, culture characteristics are depicted in Tables 2–3.

Table 2. Type and Number of Visits by Farmworkers to Different Types of Intertidal Mariculture Operations

Method	Type of Visit	# Visits per Year	Note
Rack-and-Bag	Place racks	0.2	Once every 5 years
	Inspections	104	Range of 1–3 times per week, assumed average of twice per week
	Flip bags	26	Bags flipped on average every two weeks
	Grade oysters	6.4	Every 6–8 weeks in summer (Feb to Oct) and every 8–12 weeks in winter (Nov to Jan)
	Plant and harvest	1	Plant and harvest once per 2 years
Cultch-on-Longline	Staking lines	0.2	Once every 5 years
	Monthly inspection	12	
	Plant and Harvest	1	Plant and harvest once every two years
Basket-on-Longline	Stake lines	0.2	Once every 5 years
	Grade oysters	6.4	Every 6–8 weeks in summer (Feb to Oct) and every 8–12 weeks in winter (Nov to Jan)
	Plant and harvest	1	Plant and harvest once per 2 years

- "Shaded cells" depict the maximum values for each culture characteristic. These values represent the maximum level of effort that generally occurs for the various mariculture methods.

* The information provided is for individual culture units (i.e., a single bag, longline, or basket). A group of units would generally be visited more frequently.

Table 3. Culture Characteristics of Example Intertidal Culture Methods

Method	Water Surface Area (ft^2) in Culture per Acre	Volume (ft^3) of Shellfish Culture Equipment and Cultured Organisms per Acre	Benthic Footprint (ft^2) per Acre	Biomass (kg) of Shellfish Dry Weight per Acre (6% of Live Weight)
Rack-and-Bag	13,068 (30%)	8,736	4.36	253
Cultch-on-Longline	4,792 (11%)	1,947	118.07	97
Basket-on-Longline	3,484 (8%)	1,623	11.80	207

- "Shaded cells" represent the maximum values for each culture characteristic. Under the Project, these maximum values are the culture characteristic thresholds that cannot be exceeded by shellfish culture operations.

Site Specific Thresholds

Farmworker activity at the sites must not exceed the general activity levels described for rack-and-bag culture (Tables 2). Additionally, the thresholds identified in Table 3 cannot be exceeded. Site specific thresholds were determined by scaling the thresholds to the size of each site (i.e., multiplying each site's area suitable for culture by the relevant threshold values) (Table 4).

Table 4. Site Specific Culture Characteristic Thresholds

Culture Area	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)
HBHD 1	36	476,261	318,382	4,303	9,221
HBHD 2	48	632,912	423,104	5,718	12,253
HBHD 3	45	593,129	396,509	5,359	11,483
HBHD 4	16	205,245	137,207	1,845	3,974
HBHD 5	46	601,128	401,856	5.431	11,638
Yeung	45	593,791	396,951	5,365	11,496
Total	238	3,104,675	2,075,485	28,051	60,107