INITIAL STUDY

Prepared Pursuant to the California Environmental Quality Act

PROJECT: COAST SEAFOODS COMPANY, HUMBOLDT BAY SHELLFISH CULTURE PERMIT RENEWAL AND EXPANSION PROJECT

LEAD AGENCY: HUMBOLDT BAY HARBOR, RECREATION AND CONSERVATION DISTRICT

DRAFT

January 20, 2015

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Section 1.0 Introduction

1.1 Purpose of this Document

This initial study (IS) assesses the environmental effects of expanding the shellfish culture operations conducted by Coast Seafoods Company in Humboldt Bay, California. The name of the project is "Coast Seafoods Company, Humboldt Bay Shellfish Culture: Permit Renewal and Expansion Project" (the Project). This IS was prepared pursuant to the requirements of the California Environmental Quality Act (CEQA) and in compliance with the State CEQA Guidelines (Title 14, California Administrative Code, Section 1400 et seq.).

The Humboldt Bay Harbor, Recreation and Conservation District (District) is the lead agency under CEQA. The District must evaluate the environmental impacts of the Project prior to considering Project approval. The IS serves as an informational document to be used in local planning and decision-making, and does not recommend approval or denial of the Project.

1.2 Scope of this Document

This document evaluates the Project's potential impacts related to the following topics:

- aesthetics
- agricultural resources
- air quality
- biological resources
- cultural resources
- geology and soils
- greenhouse gas emissions
- hazards and hazardous materials
- hydrology and water quality
- land use planning
- mineral resources
- noise
- population and housing
- public services
- recreation
- transportation/traffic
- utilities and service systems
- mandatory findings of significance

1.3 Impact Terminology

The following general terms are used in this IS to describe the significance of impacts that could result from the Project:

- The Project is considered to have *no impact* if the analysis concludes that the Project could not affect a particular resource topic.
- An impact is considered *less than significant* if the analysis concludes that the Project would cause no substantial adverse change to the environment and that impacts would not require mitigation.

- An impact is considered *less than significant with mitigation* if the analysis concludes that the proposed Project would cause no substantial adverse change to the environment with the inclusion of mitigation measures identified by the lead agency.
- An impact is considered *environmentally significant* if the analysis concludes that the proposed Project would cause substantial adverse change to the environment that could not be reduced to less-than significant levels by the inclusion of identified mitigation measures.

PROJECT TITLE: Coast Seafoods Company, Humboldt Bay Shellfish Culture: Permit Renewal and Expansion Project

LEAD AGENCY/CONTACT NAME AND ADDRESS: Humboldt Bay Harbor, Recreation and Conservation District, P.O. Box 1030, Eureka, CA 95502-1030. Jack Crider, Executive Director (707) 443-0801

PROJECT LOCATION: Tidelands in Humboldt Bay, CA

GENERAL PLAN DESIGNATION: Natural Resources

ZONING: Natural Resources/Water

Section 2.0 Environmental Setting and Existing Shellfish Culture

Humboldt Bay encompasses roughly 62.4 square kilometers (about 15,400 acres) at mean high tide in three geographic segments: South Bay, Entrance Bay, and Arcata Bay (or "North Bay"). As California's second-largest natural bay and the largest estuary on the Pacific Coast between San Francisco Bay and Oregon's Coos Bay, Humboldt Bay is a complex ecosystem and valuable resource for California and the nation because of its natural resources, aesthetic appeal and recreational opportunities, ecological services, economic benefits, and vital transportation links. Visitors and Humboldt County residents value Humboldt Bay for its natural and anthropogenic attributes. Humboldt Bay biota is diverse and ecologically important locally and globally, with both local fisheries, including oyster farms, and habitat for long-distance shorebird and waterfowl migrants. The Humboldt Bay area hosts more than 400 plant species, 300 invertebrate species, 100 fish species, and 260 bird species, including those that rely on the bay as they travel the Pacific Flyway. Humboldt Bay is also important in the life cycles of commercially and recreationally important fish species, including shellfish, crustaceans, and finfish. Portions of the diked former tidelands around Humboldt Bay, particularly in the Arcata Bottoms, are used for agriculture, primarily livestock grazing. The largest nearby urban concentrations are in Arcata (population approximately 16,651) and Eureka (population approximately 25,866).

During the late nineteenth and early twentieth centuries, the bay was diked and filled, reducing salt marshes from an estimated 9,000 acres to the 900 acres present today. Habitat has been further impacted by discharges of agricultural and urban runoff, industrial and recreational activities, sedimentation from the bay's watershed and other sources, colonization by the invasive grass, *Spartina*, and other stressors.

The oyster and clam culture industry in the bay produces about 70% of the oysters grown in California. Three species of mollusk are cultured in Humboldt Bay: Kumamoto oysters (*Crassostrea sikamea*), Pacific oysters (*C. gigas*) and Manila clams (*Tapes philippinarum*). There are five companies currently farming shellfish in the bay, using various methods to culture clams in subtidal areas and oysters in both subtidal and intertidal areas. There are approximately 70 raft type structures culturing shellfish in subtidal areas, 35 of which are managed by Coast Seafoods Company (Coast). Additionally, there are approximately 301 acres of intertidal areas cultured, of which approximately 293 acres are managed by Coast. Historically, Coast farmed on as many as 1,000 intertidal acres using on-bottom culture methods. However, in the late 1990's Coast adopted off-bottom (suspended) methods (Coast 2007). Coast's current and proposed culture operations are described in detail below.

There are several other permitting efforts underway in Humboldt Bay that may also allow for expanded shellfish culture operations. The District's Humboldt Bay Mariculture Pre-permitting Project (Pre-Permitting Project) would result in approximately 54 new culture rafts to mature Kumamoto oyster, Manila clam, and Pacific oyster seed and intertidal culture of Kumamoto and Pacific oysters on up to 527 acres. Additionally, Taylor Mariculture and Hog Island Oyster Company are implementing efforts that would collectively add a total of 21 culture rafts (15 floating upwelling systems (FLUPSY) and 6 nursery rafts). Some of these permits may already be obtained, with culture currently being implemented. Coast currently leases approximately 3,394 acres for shellfish culture and owns 530 acres in Humboldt Bay (Figure 1), but only farms on approximately 296 acres (3 subtidal acres and 293 intertidal acres) (Figures 2 and 3).

Figure 1. Coast Seafoods Company's shellfish culture leases and ownership in Humboldt Bay, California.

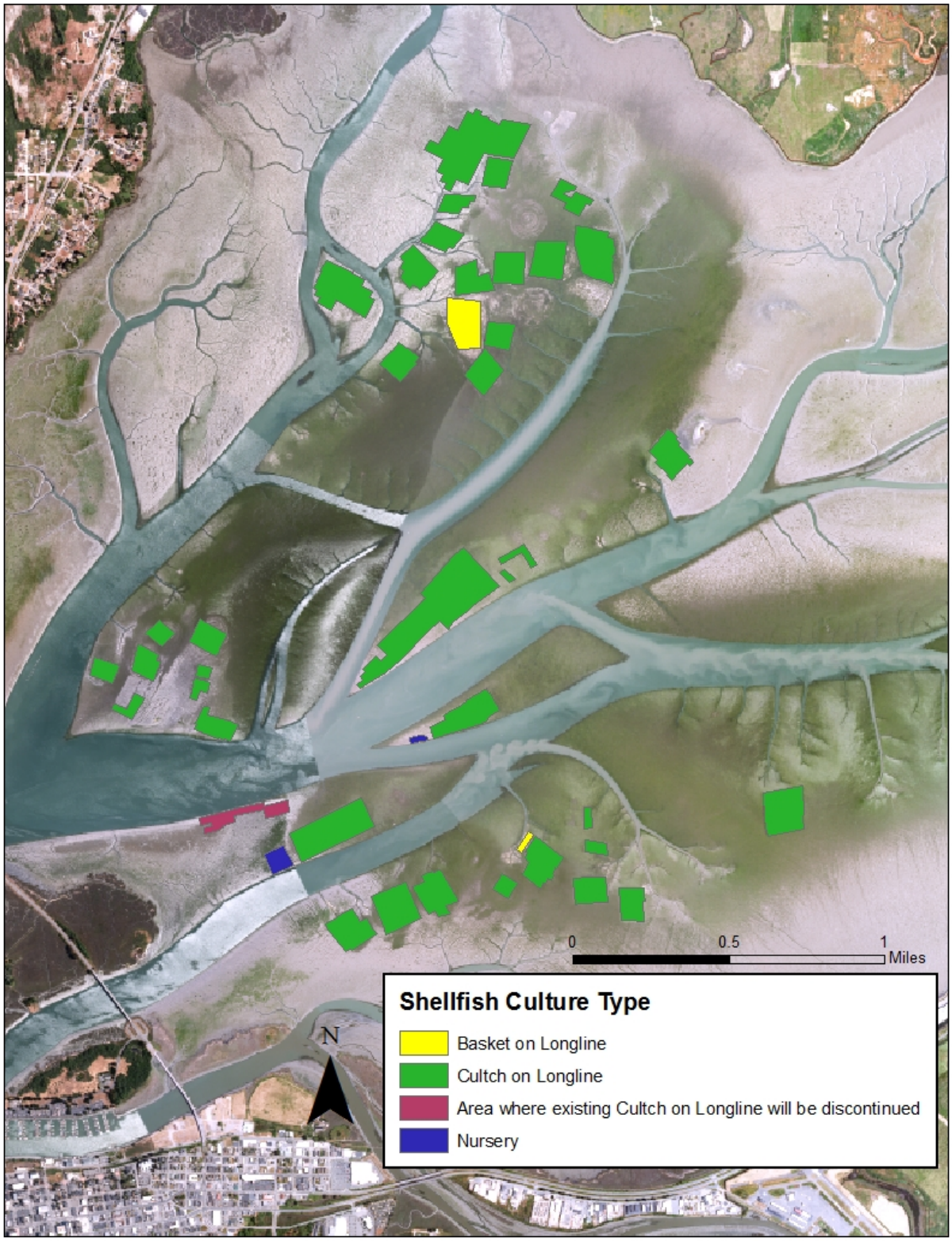

Figure 2. Coast Seafoods Company's existing intertidal shellfish culture footprint and methods, including a 6.6 acre area where existing culture will be discontinued. The methods referenced are described below.

Figure 3. Coast Seafoods Company's existing subtidal shellfish culture footprint and methods. The methods referenced are described below.

Section 3.0 Project Description

The Project consists of:

1) Extending regulatory approvals for Coast's existing 296 acres of shellfish culture, with the exception of a 6.6 acre area where farming will be discontinued (see Figures 2 and 3 regarding the spatial configuration of these operations and the section below titled "Existing Culture Methods" regarding Coast's culture methods),

2) Increasing shellfish culture within an already permitted FLUPSY by adding eight culture bins, and

3) Permitting an additional 622 acres of intertidal culture area.

The Project only involves culture of the same species that Coast currently cultures (i.e., Kumamoto oyster, Pacific oyster and Manila clam). Overall, the Project would result in a total of 910 acres cultured by Coast, 23% of the area they lease or own.

3.1 Existing Culture Methods

Only existing culture methods would be used. The following sections, which are based on Coast's existing permits, summarize these methods.

3.1.1 Intertidal Nurseries

Coast's operations within the nurseries (Figures 2 and 4) are described in their 2007 Initial Study for Humboldt Bay shellfish culture operations (Coast 2007). Within the nursery areas, Coast stacks Kumamoto oyster and Pacific oyster seed on pallets. The seed is removed from the nursery areas in approximately 2-3 months depending on seasonal conditions.

Figure 4. Bags of seed at a nursery (from Coast 2007).

3.1.2 Intertidal Cultch-on-Longline Culture

Kumamoto oysters and Pacific oysters are grown using the Cultch-on-Longline method (Figures 2, 5 and 6), as described in Coast's 2007 Initial Study (Coast 2007), but referred to as "long-line oyster culture" in that document. The method is as follows (Coast 2007). Seeded long-lines are placed on notched PVC stakes arranged in rows on the mudflats. The long-lines are strung through notches on top of the PVC stakes, suspending the oyster seed approximately 1 foot above the bay bottom. Long-line spacing varies, with most spaced 2.5 feet apart, with 10- feet between each group of five lines. Some beds have 2.5 foot spacing over the entire bed.

Long-lines are planted at tides low enough to allow for walking on the bed to be planted. Bags from the nursery are gathered with a skiff and a hook during a high tide, to plant during the subsequent low tide. Alternatively, the planting crew can pull the skiff into the nursery by hand when the tide is coming in but the water is only a foot or two deep and manually throw the bags into the skiff. Bags are then transported to the bed and placed along the edge of a row of empty long-line pipe. At low tide, the long-lines are cut and pulled out alongside the empty pipe. Each bag is clipped to the long-line on the notch of each pipe. This continues until all bags are planted.

Each planted bed is inspected monthly, with virtually no other activity occurring on the bed until harvest. A bed inspection involves walking on the bed at low tide to make sure that the lines are in the notches.

Oysters are harvested when they reach a harvestable size (18 to 36 months) subject to seasonal conditions and consumer demand. Two different long-line harvest methods are used. The first, hand picking, involves placing round 20-bushel tubs on the bed at high tide using an oyster scow. Tubs are

hand filled at low tide. Long-lines are cut into manageable single clusters and placed in the tub. A floating ball is attached to each tub, and at high tide tubs are placed in the oyster scow, unloaded then placed back on the bed to be refilled.

The long-line harvester method, involves pulling Individual lines onto a scow at high tide either by hand or with a hydraulically operated roller. Hand pulled lines are cut into individual clusters, usually at the plant. Mechanically pulled lines are run through a breaker that strips the clusters from the line.

Figure 5. Cultch-on-Longline oyster culture.

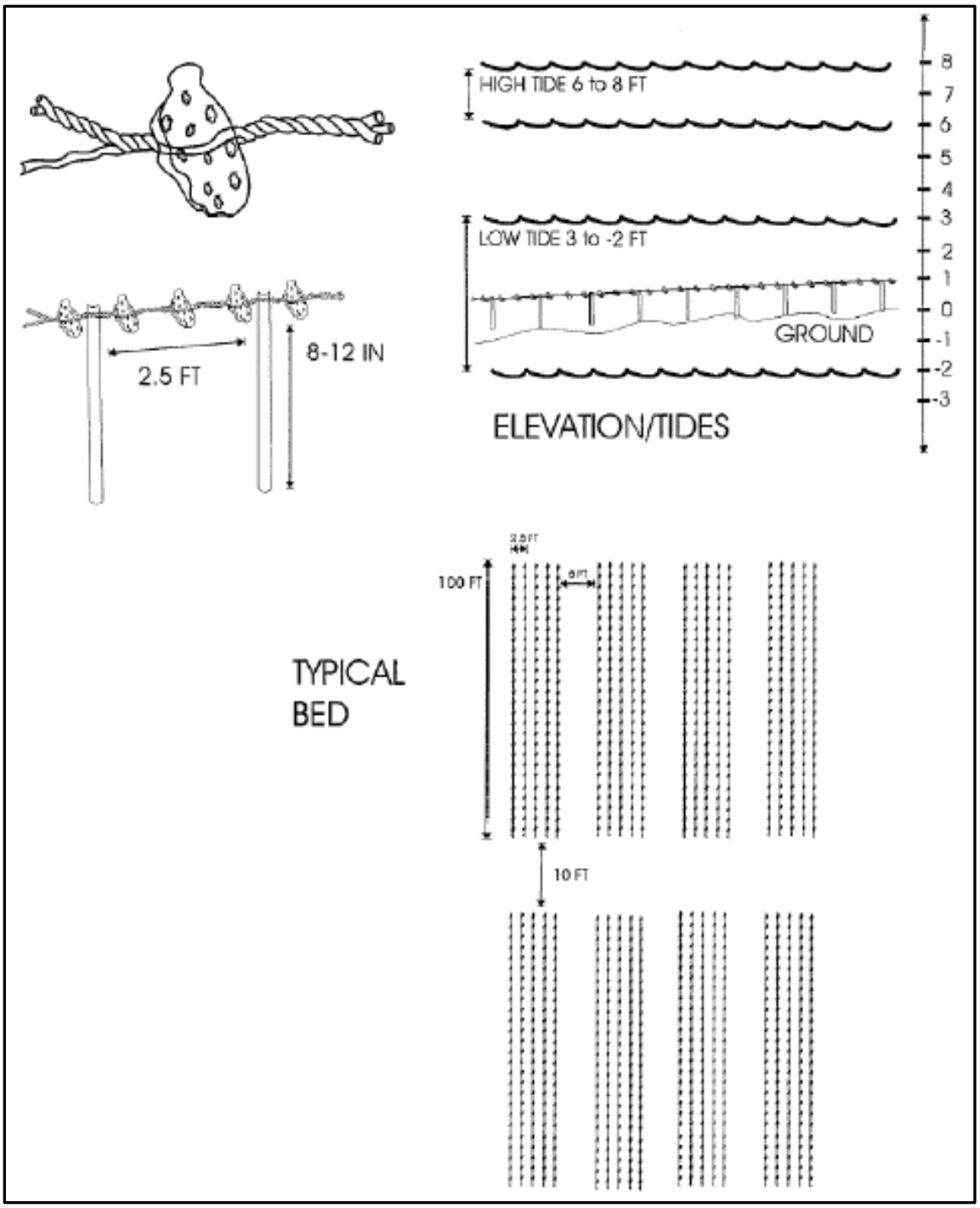

Figure 6. Example of existing configuration of Cultch-on-Longline oyster culture.[1]

[1] Longline spacing for Coast's existing longline culture will remain the same as currently planted. New longlines would be spaced as described in Section 3.3.

3.1.3 Intertidal Basket-on-Longline Culture

Kumamoto oysters are grown using the Basket-on-Longline culture method (Figures 2, 7 and 8) which utilizes baskets suspended on monofilament line that is tied between 2 inch diameter schedule 80 PVC pipes. The 5mm diameter monofilament line is encased in a 3/8" polyethylene sleeve.. The baskets are approximately 24"x10"x6" in size and are held on the line with plastic clips. A float, approximately 2.5" in diameter and 5.5" long, is often attached to the baskets so they float up during high tides. The line is positioned approximately 2.5' to 3.0' off the bottom so the baskets are roughly 1' from the bottom during low tides.

Figure 7. Basket-on-Longline culture.

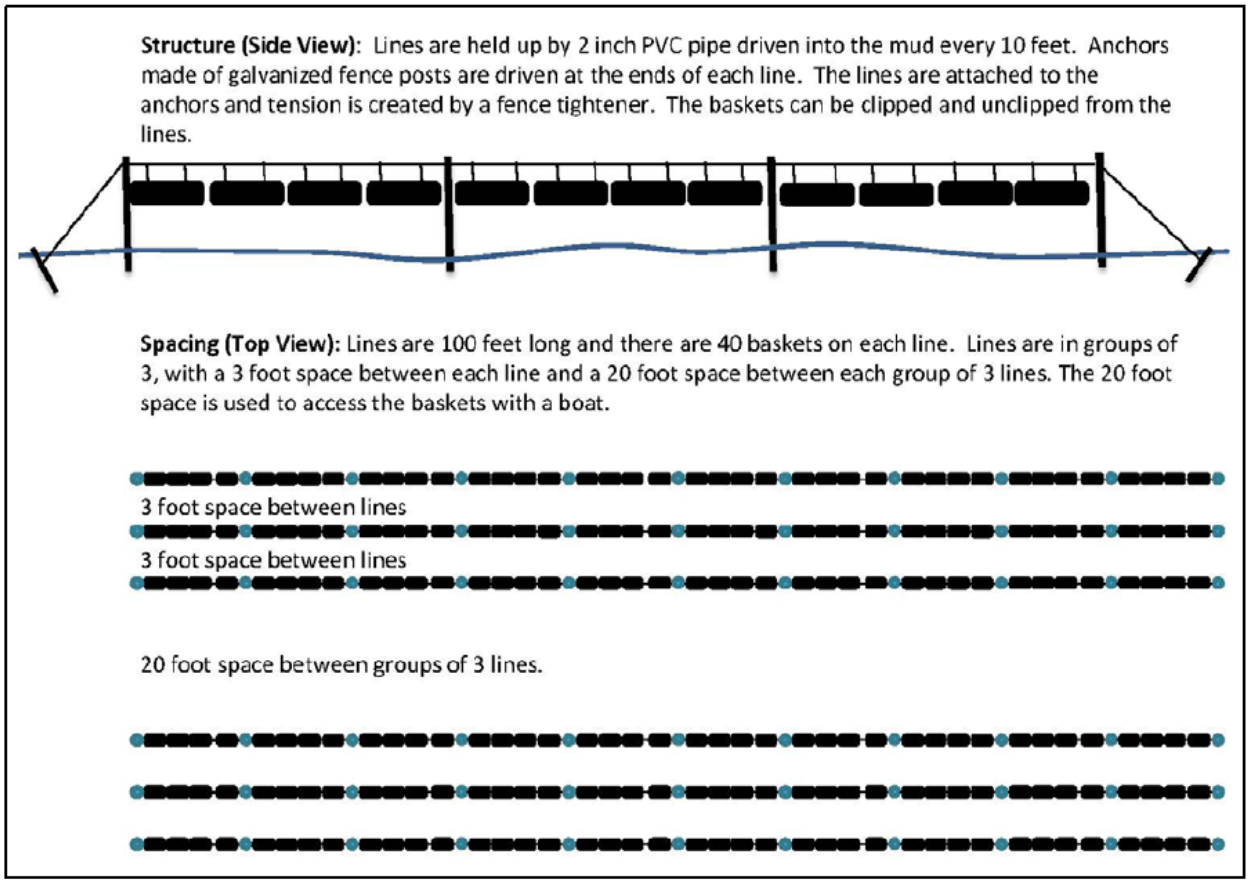

Figure 8. Configuration of Basket-on-Longline culture. Lines are a maximum of 100' long.

3.1.4 Intertidal Rack and Bag Culture

The following description was adapted from Coast Seafoods Company (2007). 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 ft x 12 ft and supports 3-6 bags attached to the frame via industrial rubber bands. Each bag is initially seeded with oysters and placed in intertidal areas. The bags are inspected up to three times per week and flipped approximately once every 2 weeks. 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. See Figures 2, 9 and 10.

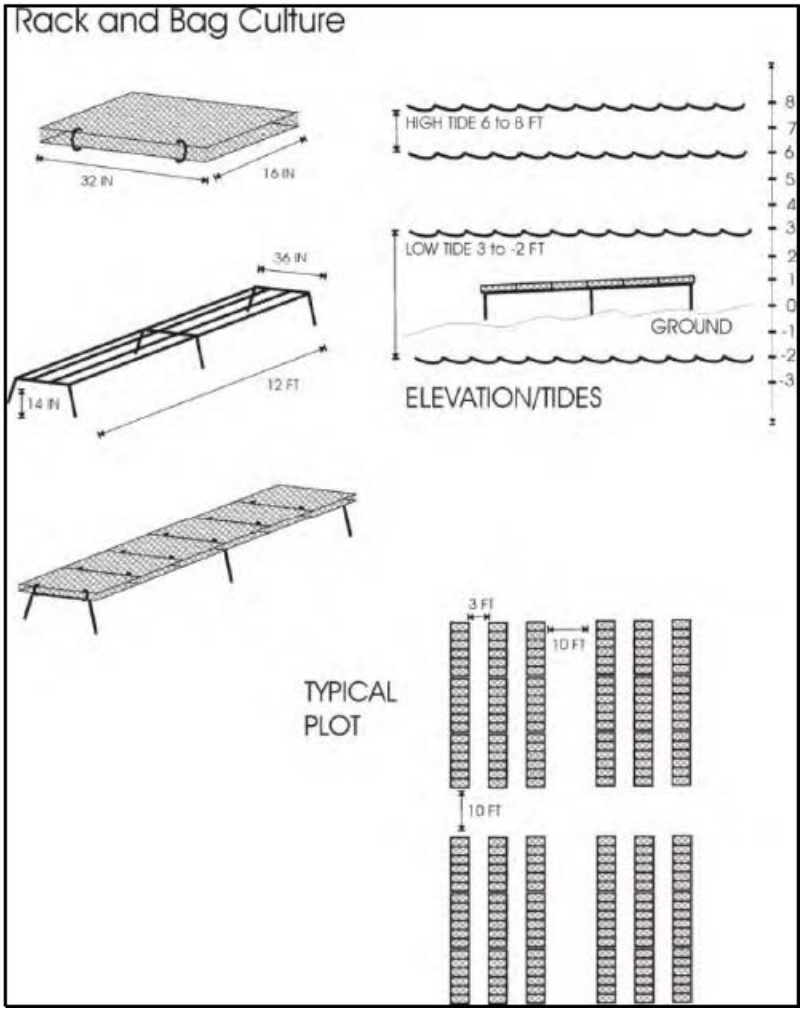

Figure 9. Rack-and-bag equipment dimensions and layout.

Figure 10. Rack-and-bag culture in Humboldt Bay.

3.1.5 Subtidal Clam Rafts

Manila clam seed is matured in clam rafts (Figures 3 and 11). The methods are described in two of Coast's Initial Studies (Coast 2007, CEC and Plauché & Stock 2011). The rafts are attached to concrete anchors in approximately 20 feet of water and are accessed by skiff. There are 30 floating rafts, each 12 feet wide by 20 feet long. The rafts are constructed from aluminum and use polyethylene encapsulated Styrofoam for floatation. Each raft has 24 tray wells, which contain seed nursery trays in stacks of about 20 suspended in each well. The rafts only contain seed, which is shipped elsewhere for grow-out and harvest. The activities at the clam rafts include placing and removing stacks of trays daily, cleaning and routine maintenance. Twice each year anchors and ground tackle are examined and repaired as necessary by divers using scuba, skiffs and an oyster barge.

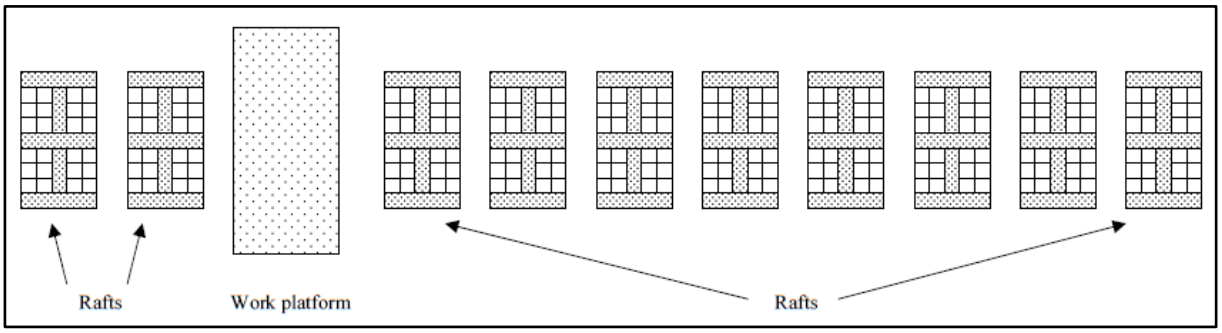

Figure 11. Subtidal clam raft configuration.

3.1.6 Subtidal Wet Storage Floats

Wet storage methods (Figures 3 and 12) are described in Coast's Initial Study (Coast 2007). The floats are anchored in approximately 20 feet of water in a series of four 20-foot by 20-foot square wooden frames. Bags of mature oysters recently harvested and ready for distribution to wholesalers are temporarily placed in the floats to maintain the oysters' fresh condition. Bags of oysters are placed and removed by hand and transported using a skiff.

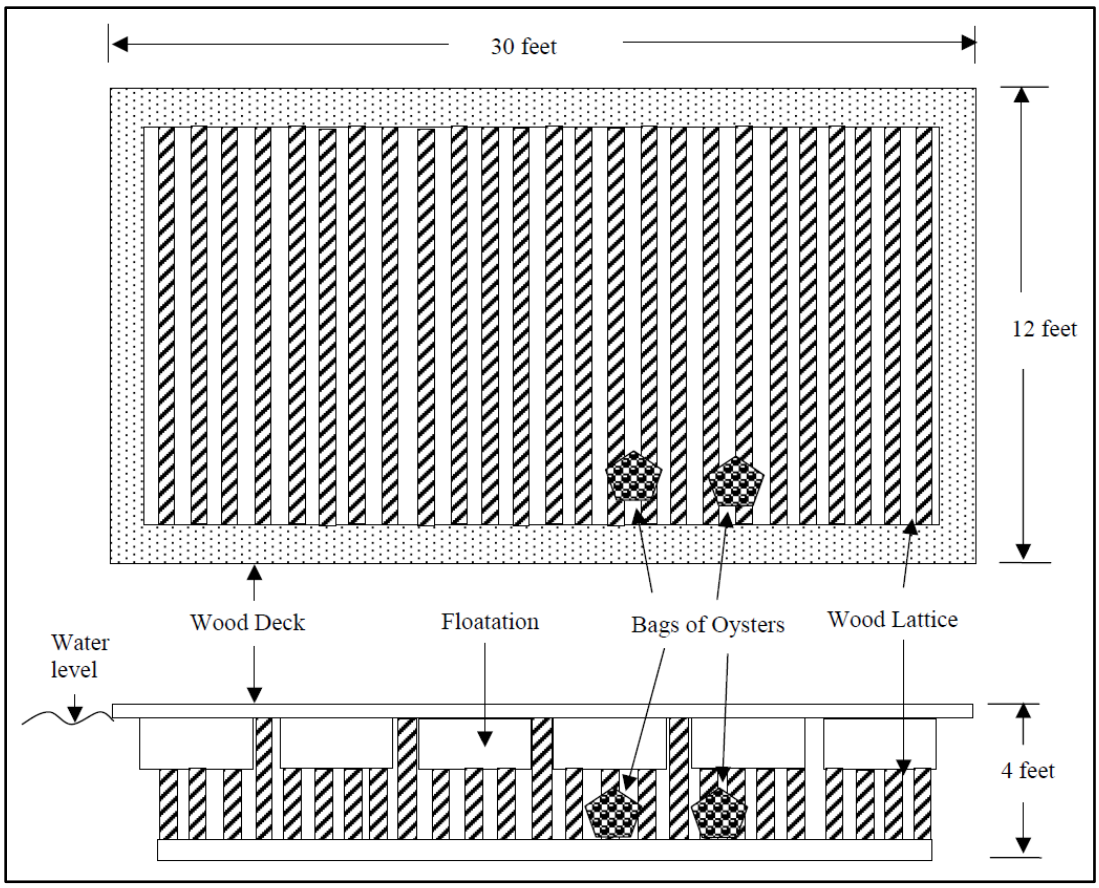

Figure 12. Configuration of wet storage floats (Coast 2007).

3.1.7 Subtidal Floating Upwelling System

Manila clam, Kumamoto oyster and Pacific oyster seed is matured in the FLUPSY (Figures 3 and 13). The method is described in Coast's Initial Study (Coast 2007). The FLUPSY is constructed of aluminum with poly-encapsulated floats for floatation and has a submerged trough containing a paddle wheel. This trough is surrounded by 16 open wells containing upwelling bins. The paddle wheel turns and moves the water out of the trough; in order for the trough to fill, the water must pass through the upwelling bins containing shellfish seed. The bins are removable for seed maintenance. The seed is about 1.4 mm long when it arrives and is matured to roughly 6 mm before being placed in bags. Activities on the FLUPSY include maintaining the seed by rinsing off bins with water, and grading seed based on size.

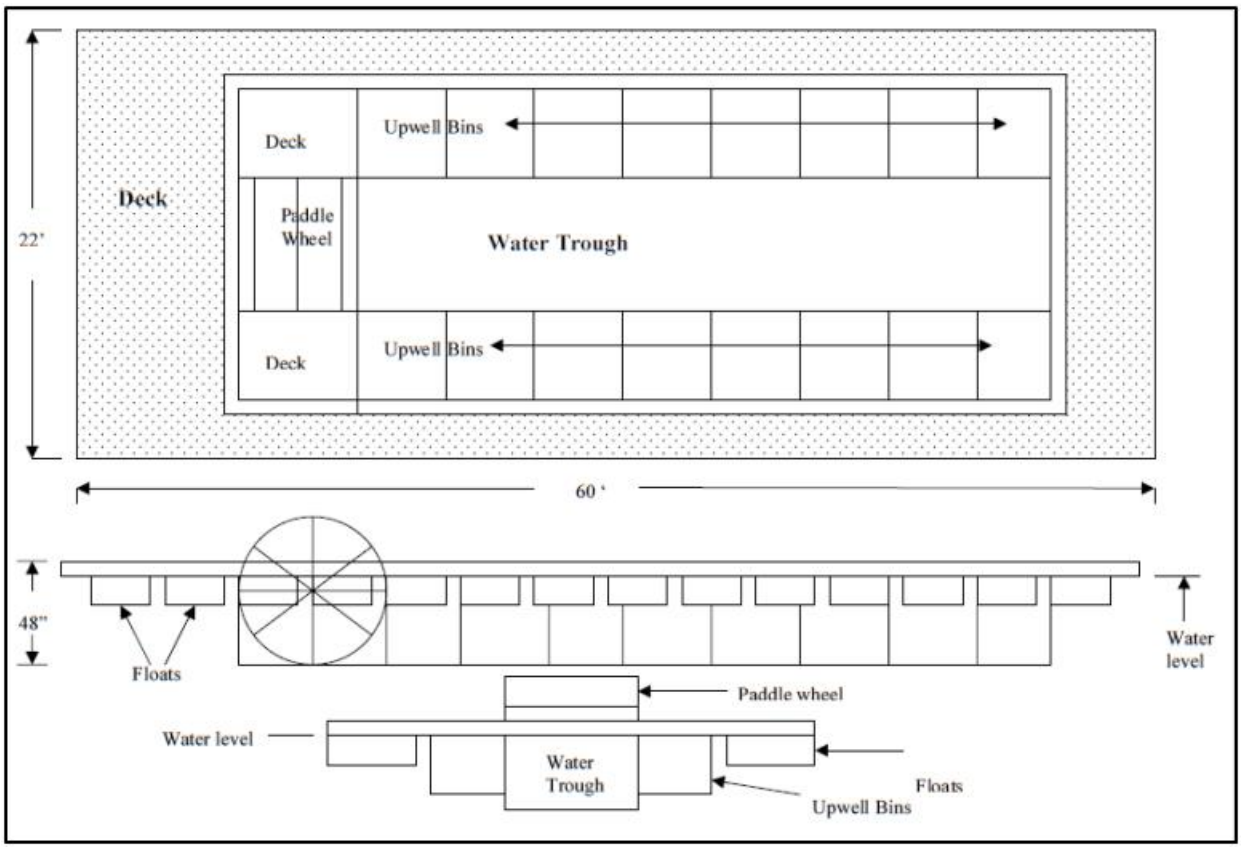

Figure 13. Configuration of floating upwelling system (Coast 2007).

3.2 Increased Shellfish Culture within the Floating Upwelling System

As part of the Project, eight upwell bins would be added to the FLUPSY described above. Each bin will be 3' long x 3' wide x 3' deep.

3.3 Intertidal Shellfish Culture Expansion

In addition to extending permits for the existing culture described above and adding eight bins to the previously permitted floating upwelling system, the Project includes an additional 622 acre intertidal culture area (Figure 14). This area corresponds with areas that Coast historically cultured. Within this area, the following methods would be used:

- Within a maximum of 522 acres, the Cultch-on-Longline method described above would be used. However, spacing between the lines would be four lines spaced 2.5 feet apart and an open row of 10 feet and then repeated (NMFS 2011). This spacing was recognized by the National Marine Fisheries Service as avoiding impacts to eelgrass in Washington State.
- Within a maximum of 100 acres, the Basket-on-Longline and/or Rack-and-Bag method described above would be used. Basket-on-longline culture would be used with three lines spaced 3 feet apart, with an open row of 20 feet, and then repeated. Rack-and-Bag culture would not be placed in eelgrass.

Figure 14. Areas proposed for continued and expanded shellfish culture.

3.4 Best Management Practices

To avoid and minimize potential environmental effects, Coast will implement the following best management practices.

BMP-1: Biofouling Organism Removal. All bio-fouling organism removal operations for the FLUPSY bins shall be carried out onshore. All bio-fouling organisms and biological materials removed during these cleaning operations shall be collected and disposed of at an appropriate upland facility. No discharge of untreated wash water or bio-fouling materials into Humboldt Bay shall occur during maintenance cleaning operations.

BMP-2: Boat Transit. During maintenance and harvesting of oysters, boat transit areas shall be limited to areas devoid of eelgrass as much as is practicable. To the extent practicable, Coast personnel shall use the same areas to moor their boats in order to minimize the amount of propeller scarring to eelgrass.

BMP-3: Shading from Longline Harvester. Where feasible, Coast will avoid contact between the long-line harvester vessel and the bay bottom. To avoid potential impacts to eelgrass from shading, Coast will not anchor the long-line harverster in such a way as to shade the same area of eelgrass for more than twelve hours.

BMP-4: Plot Abandonment. Within 30 days of harvest on any area that is being discontinued, or taken out of production for one year or more, Coast shall remove all shellfish culture apparatus from the area, including but not limited to stakes, racks, baskets and pallets.

BMP-5: Shell deposition. Coast will not intentionally deposit shells or any other material on the bay floor. Natural deposition of shells and other materials will be minimized.

BMP-6: Marine Mammal Education. At monthly staff meetings, Coast personnel shall review vessel procedures, including proper procedures relating to marine mammals. When marine mammals are encountered, Coast 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 boat operator shall reduce speed, place the vessel in nuetral 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.
- Should Coast's staff observe an injured marine mammal, they shall immdediately contact their supervisor and the California Department of Fish and Wildlife.

BMP-7: Discharges. Coast will not discharge feed, pesticides or chemicals (including antibiotics and hormones) into bay waters.

BMP-8: Equipment Maintenance. Coast shall continue to implement its equipment maintenance program for all vessels that are used in its mariculture activities, and shall consider the likelihood of release of fuels, lubricants, paints, solvents, or other potentially toxic materials that may be associated with these vessels as a result of accident, upset, or other unplanned event.

BMP-9: Herring Impacts. During the months of December, January, and February, Coast will visually survey the beds to be worked on each day prior to harvesting and/or planting, to determine whether herring has spawned on eelgrass, culture materials, or substrate. If herring spawning is observed, Coast will (a) postpone for two weeks harvesting and planting activities on those beds where spawning has occurred, and (b) notify the California Department of Fish and Wildlife's Eureka Marine Region within 24 hours.

3.5 Reporting

By December 1st of each year, Coast will produce and make available a report describing the areas cultured and specific methods used in those areas.

3.6 Public Agencies Whose Approval is Required

Agency	Permit Type
Humboldt County Harbor, Recreation & Conservation District	-Use Permit -Renewal of Tidelands Leases
City of Eureka	-Conditional Use Permit -Renewal of Tidelands Leases
United States Army Corps of Engineers	-Department of Army Permit (Section 10 Rivers and Harbors Act)
California Coastal Commission	-Coastal Development Permit and Coastal Zone Management Consistency Determination

Section 4.0 Checklist and Evaluation of Environmental Impacts

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- ❑ Aesthetics
- ❑ Biological Resources
- ❑ Greenhouse Gas Emissions
- ❑ Land Use/Planning
- ❑ Population/Housing
- ❑ Transportation/Traffic
- ❑ Mandatory Findings of Significance
- ❑ Agricultural Resources
- ❑ Cultural Resources
- ❑ Hazards/Hazardous Materials
- ❑ Mineral Resources
- ❑ Public Services
- ❑ Utilities/Service System
- ❑ Air Quality
- ❑ Geology/Soils
- ❑ Hydrology/Water Quality
- ❑ Noise
- ❑ Recreation

DETERMINATION: On the basis of this initial evaluation:

- ❑ I find that the proposed Project **could not** have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.

- ❑ I find that although the proposed Project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.

- ❑ I find that the proposed Project **may** have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT (EIR)** is required.

- ❑ I find that the proposed Project **may** have a "potentially significant impact" or 'potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **EIR** is required, but it must analyze only those effects that remain to be addressed.

- ❑ I find that although the proposed Project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

_____ _____

Date

Title
Humboldt Bay Harbor, Recreation and Conservation District

I. **AESTHETICS**. Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Have a substantial adverse effect on a scenic vista?			X	
B) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?				X
C) Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
D) Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?			X	

DISCUSSION

Aes-A: Scenic Vistas. State Highway 101, along the eastern shore of Arcata Bay, is eligible for designation as a State Scenic Highway and there are numerous scenic vistas from both the shores and surface waters of Humboldt Bay near the Project site.

The Project would increase mariculture operations in Humboldt Bay, thereby potentially increasing the visibility of the operations. The Project would also increase the presence of people (culturists) and boats in the bay. Mariculture operations would be located in intertidal and subtidal areas and would be visible from the shores of Arcata Bay and from the bay surface (e.g., from boats); however, existing mariculture equipment (including Coast's facilities) are an existing characteristic of the Bay's visual background. Further, the expanded cultivation would occur in the same general areas where Coast has existing shellfish operations (see Figure 14), minimizing its visual impact. The Humboldt County General Plan acknowledges that resource production areas add to the scenic value of Humboldt County (Policy SR-PX). No structures would be placed within 200 feet of a scenic road or viewpoint. Mariculture equipment also typically does not extend more than 2 feet above the water surface, with the most exposure occurring during low tides. Views of shellfish culture operations are common in Humboldt Bay and consistent with the current aesthetic character of the area. Hence, this potential impact is less than significant.

Aes-B: Scenic Resources. No scenic resources would be damaged. Hence, no impact is expected.

Aes-C: Visual Character. The Project would expand shellfish culture operations within Coast's existing leased footprint in and around areas that Coast already uses for shellfish cultivation. Where mariculture operations do not currently occur, the visual character would appear similar to current activities on the bay, including adjacent areas. The low profile of the equipment used in the operations and the fact that most of the equipment will often be submerged, minimizes the visual impact to the Project site and surrounding properties. Hence, this potential impact is considered less than significant.

Aes-D: Light or Glare. The Project would involve increased lighting from boats and workers to enable occasional work at night. This lighting could be viewed by people on the shores of the bay, but because the lights would be distant from these viewers, the effect would be negligible. People on the bay (i.e., boaters) would be exposed to the lights at a closer distance, but the increased lighting would generally improve boating safety, and views would not be adversely affected.
The Project would create new sources of light during night time operations; however, this new source

of light would not be substantial and would not adversely affect day or night time views in the area. Hence, this potential impact is considered less than significant.

II. AGRICULTURAL RESOURCES.	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
B) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
C) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

DISCUSSION

Ag-A through Ag-C: There is no agricultural land, forest land, or area zoned as agricultural or forest land immediately adjacent to the Project site, but there is agriculturally zoned land on the shores of Humboldt Bay. The Project would have a beneficial effect on agricultural resources by increasing the footprint of shellfish culture in Humboldt Bay. There would be no negative impacts on agricultural resources, and the proposed land use is consistent with existing zoning, including zones designated by the City of Eureka Municipal Code (Section 156.065) and County of Humboldt Code (Section 313-5.4). The use is also consistent with policies pertaining to this part of the bay that are described in the Humboldt Bay Management Plan (HBHRCD 2007) (Section 2.3.2). Hence, no impact is expected.

III. **AIR QUALITY**. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Conflict with or obstruct implementation of the applicable air quality plan?		X		
B) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
C) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors)?		X		
D) Expose sensitive receptors to substantial pollutant concentrations?				X
E) Create objectionable odors affecting a substantial number of people?				X

DISCUSSION

Air-A through Air-C: Air Quality Standards. The Project area is located in the North Coast Air Basin and is under the jurisdiction of the North Coast Unified Air Quality Management District (AQMD). The North Coast Air Basin is in attainment of all federal and State air quality standards except for particulate matter smaller than 10 microns in diameter (PM_{10}) under California regulations.

Small boats associated with mariculture operations have internal combustion engines that generate particulate matter. The proposed Project would involve the use of up to four such vessels. The vessel engines would contribute to a minor net increase in emissions of particulate matter. Given the small size and limited quantity of vessels, their contribution to PM_{10} levels in Humboldt Bay is likely negligible, even without mitigation.

Moreover, the District lacks direct jurisdiction over air quality, and thus lacks direct authority to require mitigation for potential air quality impacts. However, the AQMD regulates vessel engine emissions pursuant to several air quality plans. CEQA addresses circumstances such as this through reliance by lead agencies on the regulatory oversight of responsible agencies carrying out statewide policy. Specifically, State CEQA Guidelines Section 15064(h) establishes a procedure that allows lead agencies, including the District, to rely on the environmental standards promulgated by other regulatory agencies, such as the AQMD, with respect to pollutant regulation. The AQMD has adopted several air quality management plan elements, including a "PM_{10} Attainment Plan."

The District finds that Coast would not contribute to a cumulatively significant air quality impact if the company complies with the PM_{10} Attainment Plan adopted by the AQMD and all attendant regulations established thereto. This conclusion is incorporated into the following mitigation measure:

Mitigation Measure Air-1: Coast Seafoods Company shall consult with the AQMD with respect to the requirements of adopted AQMD regulatory plans. Coast Seafoods Company shall comply with the

requirements of all adopted air quality plans, including plans covering particulate emissions, and shall implement all actions required by the AQMD for Coast Seafoods Company's mariculture operations.

With implementation of this mitigation measure, potential air quality impacts would be less than significant.

Air-D and Air-E: Air Quality Effects on People. The Project would not create any substantial pollution concentrations or objectionable odors. Additionally, there are no sensitive receptors or a substantial number of people in the immediate vicinity of the Project site. Hence, no impact is expected.

IV. **BIOLOGICAL RESOURCES**. Would the Project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
B) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
C) Have a substantial adverse effect on Federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
D) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
E) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
F) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?				X

Bio-A: Effects on Candidate, Sensitive, or Special-status Species. The following species are identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife (CDFW) or U.S. Fish and Wildlife Service (USFWS).

Common Name	**Scientific Name**	**Status**[1]
Green sturgeon, southern DPS	*Acipenser medirostris*	FT/CSSC. Designated critical habitat in Humboldt Bay.
Coho salmon, southern Oregon, northern California ESU	*Oncorhynchus kisutch*	FT/ST
Steelhead, Northern California DPS	*Oncorhynchus mykiss*	FT

Chinook salmon, California coastal ESU	*Oncorhynchus tshawytscha*	FT
Coastal cutthroat trout	*Oncorhynchus clarki clarki*	CSSC
Pacific eulachon – southern DPS	*Thaleichthys pacificus*	FT
Longfin smelt	*Spirinchus thaleichthys*	ST
California brown pelican	*Pelecanus occidentalis californicus*	FP
Western snowy plover	*Charadrius nivosus nivosus*	FT/CSSC
Marbled murrelet	*Brachyramphus marmoratus*	FT/SE
Harbor seal	*Phoca vitulina*	Protected under the Marine Mammal Protection Act
Harbor porpoise	*Phocaena phocaena*	Protected under the Marine Mammal Protection Act
California sea lion	*Zalophus californiaus*	Protected under the Marine Mammal Protection Act

Notes: DPS = Distinct Population Segment; ESU = Evolutionarily Significant Unit.
[1] Status abbreviations: FT = Federally listed as threatened; ST = State-listed as threatened; CSSC = California Species of Special Concern; FP = Fully protected in California.

These species are described below.

Green Sturgeon
The green sturgeon is a long-lived, slow-growing fish species. Mature males range from 4.5 to 6.5 feet in fork length and they do not mature until they are at least 15 years old, whereas mature females range from 5 to 7 feet in fork length and do not mature until they are at least 17 years old (National Oceanic and Atmospheric Administration [NOAA] Fisheries 2012). The maximum ages of adult green sturgeon are likely to range from 60 to 70 years. This species is found along the west coast of Mexico, the United States, and Canada.

The life history of green sturgeon is typical of anadromous fish. They spend most of their lives in nearshore oceanic waters, bays (including Humboldt Bay), and estuaries. Spawning occurs in deep pools in large rivers. Currently, spawning is believed to occur in the Klamath River basin, the Sacramento River, and the South Fork of the Trinity River; however, the listed southern DPS is only known to spawn in the Sacramento River, but migrates northward to Canada along the coast and enters bays and estuaries. Spawning does not occur in creeks flowing into Humboldt Bay. Green sturgeon adults have been observed in channels within Humboldt Bay (Lindley et al. 2011) and Humboldt Bay is designated as critical habitat (74 FR 52300).

Coho and Chinook Salmon, Steelhead, and Coastal Cutthroat Trout (Salmonids)
Salmonid life history is characterized by periods of ocean/coastal pelagic conditions, adult upstream migration, spawning and egg development, fry and juvenile development and rearing, and smolt outmigration. Channels in marsh habitats may be of particular importance to subyearling salmonids because they contain abundant insect and invertebrate prey resources and may provide refuge from predators (Bottom et al. 2005). Pinnix et al. (2013) found that in Humboldt Bay, juvenile coho salmon utilize deep channels, channel margins and floating eelgrass mats as they migrate offshore as smolts to the ocean. Juvenile coho salmon were less likely to occur in shallow channels with large intertidal mudflats and eelgrass meadows in Humboldt Bay (Pinnix et al. 2013).

Pacific Eulachon – Southern DPS
The Pacific eulachon is a small, anadromous fish from the eastern Pacific Ocean (76 FR 65324). Eulachon spend 3–5 years at sea before returning to freshwater to spawn, from late winter to mid-spring. Eggs are fertilized in the water column, then sink and adhere to the river bottom of coarse sand and gravel. Most adults die after spawning. Eggs hatch in 20–40 days, and larvae are carried downstream and "dispersed by estuarine and ocean currents shortly after hatching" (76 FR 65324).

Eulachon have been documented in Humboldt Bay and spawn in nearby coastal rivers, such as Redwood Creek and the Mad River, although in local rivers, the species is thought to be extirpated (or nearly so). California Natural Diversity Database (CNDDB) records of the species contain no dates, specific locations, or other survey information. In 1996, the Yurok tribe supported a eulachon sampling effort on the Klamath River, of over 110 surveying hours, from early February to early May. No eulachon were observed.

Longfin Smelt
The longfin smelt is a short-lived species (generally living 2 years). Adults spawn in low-salinity or freshwater areas in the lower reaches of coastal rivers. The buoyant larvae are swept into more brackish waters, where they rear. Longfin smelt are known to occur in Humboldt Bay, but little is known regarding their distribution, abundance or life history there. Larval longfin smelt have been captured in the winter in bottom trawls in Humboldt Bay (Eldridge and Bryan 1972).

California Brown Pelican
The brown pelican was listed as endangered until 2009 when the California brown pelican population was determined to have sufficiently recovered to be delisted by both the federal (74 FR 59443) and state agencies (Fish and Game Commission 2009). Pelican populations were decimated by the effects of DDT and the species began to recover after the chemical was banned in 1972. The California brown pelican ranges along the Pacific Coast from California to Mexico. Established breeding colonies occur on West Anacapa Island, Santa Barbara Island, and at the Salton Sea; communal winter roosts occur throughout the range (Shields 2002). Preferred winter roost sites are comprised of estuaries, sand bars, spits, or beaches that are close to aquatic foraging grounds, allow the birds to dry off after foraging, and offer shelter from predators and the elements (Jacques et al 1996, Shields 2002). Pelicans forage in relatively warm brackish and ocean waters where fish are close enough to the surface to be captured by plunge-diving birds (Shields 2002). Non-breeding brown pelicans occur in Humboldt Bay, most commonly in the fall, and often roost on artificial structures, particularly in areas that are isolated from human disturbance.

Western Snowy Plover
The western snowy plover nests along the Pacific Coast from Damon Point, Washington to Bahia Magdalena, Baja California, Mexico (USFWS 2007). Degradation and use of habitat for human activities has been largely responsible for the decline in the snowy plover breeding population; other important threats to the snowy plover are mammalian and avian predators, and human disturbance (Page et al. 1995). In the Humboldt Bay region, western snowy plovers primarily breed and winter in ocean-fronting beaches (Brindock and Colwell 2011) although small numbers of plovers have been documented nesting in gravel bars of the Eel River (Colwell et al. 2011). Nonbreeding western snowy plovers occasionally occur in Humboldt Bay, but mostly in the South Bay on sandier substrates rather than on softer substrates associated with mudflats in Arcata Bay.

Marbled Murrelet
The marbled murrelet occurs along the Pacific coast from Alaska to California, foraging nearshore in marine subtidal and pelagic habitats for small fish and invertebrates (USFWS 2011). Breeding occurs in mature, coastal coniferous forest with nests built in tall trees. In California, breeding occurs primarily in Del Norte and Humboldt counties. The loss of old-growth forest is a primary reason for this species' decline (USFWS 1992). In California, marbled murrelets nest in redwoods that are older than 200 years (Nelson 1997). They are also vulnerable to oil spills along the coast. Marbled murrelets can occur in Humboldt Bay as foragers, and are expected to primarily occur in the entrance portion of the bay.

Harbor Seal
Harbor seals are widely distributed throughout the northern Atlantic and Pacific Oceans along coastal waters, river mouths, and bays (Burns 2008; Lowry et al. 2008). Harbor seals consume a variety of prey, but small fishes predominate in their diet (Tallman and Sullivan, 2004). In northern California, pupping peaks in June and lasts about 2 weeks; pups are weaned in 4 weeks (Burns 2008). Foraging occurs in a variety of habitats, from streams to bays to the open ocean, and harbor seals can dive to depths of almost 500 m (Eguchi and Harvey 2005). Harbor seals breed along the Humboldt County coast and inhabit the area throughout the year (Sullivan, 1980). Harbor seals use Humboldt Bay as a pupping and haul-out area; other nearby haul-out sites are located in Trinidad Bay and the mouths of the Mad and Eel Rivers.

Harbor Porpoise
Harbor porpoises are distributed throughout the coastal waters of the North Atlantic and North Pacific Oceans, and the Black Sea. In the North Pacific, they range from Point Conception, California, to as far north as Barrow, Alaska, and west to Russia and Japan (Angliss and Allen, 2009; Carretta et al., 2009; Gaskin, 1984). Harbor porpoises from California to the inland waters of Washington have been divided into six stocks (Carretta et al., 2009), with three additional stocks occurring in Alaskan waters (Angliss and Allen, 2009). Porpoises from Humboldt County are included in the northern California/southern Oregon stock that extends from Point Arena to Lincoln City, Oregon (Carretta et al., 2009). Harbor porpoises have been observed throughout the year at the entrance to and within Humboldt Bay, usually as single individuals but sometimes in groups, with a maximum size of 12 animals (Goetz, 1983). Abundance peaks between May and October, and porpoises are most abundant in Humboldt Bay during the flooding tide.

California Sea Lion
California sea lions are restricted to middle latitudes of the eastern North Pacific. There are three

recognized management stocks: (1) the U.S. stock from Canada to Mexico, (2) the western Baja California stock, and (3) the Gulf of California stock (Carretta et al., 2009; Lowry et al., 2008). Breeding colonies only occur on islands off southern California, along the western side of Baja California, and in the Gulf of California (Heath and Perrin, 2008). California sea lions feed on fish and cephalopods, some of which are commercially important species such as salmonids (*Oncorhynchus spp.*), Pacific sardines (*Sardinops sagax*), northern anchovy (*Engraulis mordax*), Pacific mackerel (*Scomber japonicus*), Pacific whiting (*Merluccius productus*), rockfish (*Sebastes spp.*), and market squid (*Loligo opalescens*) (Lowry and Carretta, 1999; Lowry and Forney, 2005; Lowry et al., 1991; Weise, 2000). California sea lions do not breed along the Humboldt County coast; however non-breeding or migrating individuals may occur in Humboldt Bay.

Following, potential Project-related impacts on these species are discussed.

Bio-A1: Reduction of Prey for Green Sturgeon. Tributaries to Humboldt Bay do not provide spawning habitat for green sturgeon. However, adult green sturgeon are known to temporarily reside in deeper channels in the bay (Lindley et al. 2011). Beamis and Kynard (1997) suggested that green sturgeon move into the estuaries of nonnatal rivers to feed; this is likely true for Humboldt Bay. Likely food sources for green sturgeon are small fishes and benthic invertebrates associated with silty/sandy substrates and benthic fauna. There are two potential processes by which the proposed mariculture operations could reduce these prey resources: by displacing prey and by causing ecosystem changes that result in reduced prey populations or availability. The first potential effect is discussed below. The second is discussed in Bio-A6, "Changes in the abundance of suspended organic matter and related effects on native species."

The proposed intertidal mariculture areas are only temporarily inundated with tidal waters. Small fish that may be prey for green sturgeon likely forage in these areas. However, there is ample space for prey fish species to forage among the mariculture equipment and cultured shellfish. Additionally, cultured shellfish and mariculture equipment can benefit small fish by providing habitat and food resources (see review by Dumbauld et al. 2009). Hence, the Project's proposed intertidal shellfish culture is not expected to negatively affect small fish. Additionally, benthic invertebrates have been shown to occur at higher densities in intertidal areas with cultured shellfish than in intertidal areas without cultured shellfish (see review by Dumbauld et al. 2009). Therefore, intertidal culture would not have an adverse impact on prey resources for green sturgeon. Also, the eight proposed upwelling bins would not displace sturgeon prey (small fish and benthic invertebrates) because sturgeon are principally benthic feeders (Billard and Lecointre 2001), and the proposed bins would be located on the water surface. Therefore, the Project is expected to have a less-than-significant effect on green sturgeon as a result of prey reduction; no mitigation measures are recommended.

Bio-A2: Entanglement of Green Sturgeon. As an anadromous species, sturgeon swim among diverse structures in rivers, embayments, and the ocean. They have the sensory ability to detect structures and the swimming ability to avoid them, making it unlikely that green sturgeon would collide or become entangled with mariculture equipment or cultured shellfish. Shellfish culture has occurred for decades in West Coast embayments where sturgeon occur, and there is no known record (anecdotal or otherwise) of a sturgeon ever becoming entangled in mariculture equipment. The Project would therefore pose a less-than-significant entanglement risk to green sturgeon.

Bio-A3: Impacts of Water Intakes on Aquatic Species. Coast's FLUPSY, which would be expanded by eight bins under the proposed Project, contains water intakes that could impinge or entrain small organisms, including special-status fish species (e.g., salmonids and longfin smelt). With implementation of Mitigation Measure Bio-1 below these species would be protected from impingement and entrainment and this impact is less than significant.

Bio-A4: Changes in the Distribution and Abundance of Predators of Native Fish. The Project would create fish habitat consisting of floating in-water structures (the FLUPSY bins) over sand or silt bottoms at subtidal sites, and various types of off-bottom mariculture equipment over sand or silt bottoms at intertidal sites.

Because the intertidal sites are only temporarily inundated with water, the mariculture equipment at these sites is unlikely to attract predatory fish species. At the subtidal sites, hook and line surveys of fish species associated with 30 floating clam rafts in Arcata Bay was conducted in August 2014 (HTH 2014). Species captured included walleye surfperch (*Hyperprosopon agenteum*), topsmelt (*Atherinops affinis*), jacksmelt (*A. californiensis*), sardine (*Sardinops sagax*), northern anchovy (*Engraulis mordax*), and juvenile rockfish (*Sebastes* spp). These species don't prey on juvenile longfin smelt, juvenile salmonids, or other special-status fish. According to Fritzsche and Collier (2001):
"…the diet of surfperches consists of isopods (e.g., rock lice), of all sizes, and gastropod mollusks (e.g., snails); various amphipods (e.g., skeleton shrimp), polychaete worms, brittle stars, and small crabs, also are included. Surfperches are usually bottom grazers, but apparently will feed mid-water when competitors are absent."

According to Love et al. (1990), newly recruited rockfish eat mostly crustaceans. Rockfish species that shift to substrate-associated prey begin feeding on larger algal-associated gammarid amphipods, shrimps, and isopods. Based on this information, the Project is unlikely to attract or encourage predators of special-status fish and the impact is considered less than significant without mitigation.

Bio-A5: Impacts of structures on fish species. The Project's FLUPSY bins would create new overwater structure in Humboldt Bay. Toft et al. (2007) researched fish use of overwater structure in Puget Sound Washington and determined that juvenile salmonids avoid swimming beneath overwater structures, whereas surfperch (Embiotocidae), crabs (Brachyura) and sculpins (Cottidae) were observed beneath or adjacent to pilings. During an acoustic telemetry study in Humboldt Bay, Pinnix et al. (2013) found coho salmon were most often associated with deep channels followed by channel margins, floating eelgrass mats and finally pilings/docks. Hook and line surveys of fish species associated with 30 floating clam rafts in Arcata Bay was conducted in August 2014 (HTH 2014). Species captured included walleye surfperch (*Hyperprosopon agenteum*), topsmelt (*Atherinops affinis*), jacksmelt (*A. californiensis*), sardine (*Sardinops sagax*), northern anchovy (*Engraulis mordax*), and juvenile rockfish (*Sebastes* spp). These species are all native to Humboldt Bay and may benefit from the structural habitat provided by the rafts, though this is uncertain. Regardless, no adverse impact is expected. Juvenile salmonids may avoid overwater structures, as suggested by Toft et al. (2007) and Pinnix et al. (2013). Typically, the structures noted in these studies include ones that extend from the intertidal into the subtidal habitat. The area of overwater water structure (eight 3'x3' bins) being added is discountable and is only located in subtidal waters. Therefore, additional structure provided by FLUPSY bins is not expected to have an adverse effect on fish species and this impact is considered less than significant without mitigation.

The project would also result in the placement of additional shellfish equipment in intertidal areas, in the form of longlines and rack-and-bag gear. Studies of off-bottom mariculture operations have shown higher abundances of some fishes and invertebrates in areas with shellfish culture than in nearby areas with eelgrass or unstructured open mudflat, although eelgrass does attract some unique species of fish. For example, Laffargue et al. (2006) demonstrated that the flatfish, *Solea solea*, displayed a strong affinity for oyster-rearing structures in the Bay of Biscay, France, when resting or seeking refuge during the day. Tallman and Forrester (2007) showed that oyster grow-out cages provided valuable habitat for economically valuable finfishes in Narragansett Bay, Rhode Island, and suggested that these structures be considered as part of future habitat restoration programs for exploited species. In Willapa Bay, Washington, juvenile Chinook salmon and English sole were found in association with all studied habitats (e.g., eelgrass, oyster aquaculture, and mudflats) without an apparent preference, while tubesnouts and smelt were clearly associated with eelgrass (Hosack et al. 2006, Dumbauld et al. 2009).

Pinnix et al. (2005) researched fish utilization between eelgrass, oyster culture, and mudflat habitats in North Bay. Although results varied depending on the type of sampling gear used, both shrimp and fyke net sampling resulted in fish abundance that was significantly higher in oyster culture habitat compared to the other two habitat types. When species diversity (which normalizes for abundance) was calculated, it was noted that oyster culture and eelgrass beds supported a similar diversity. Overall, it is evident that fish are attracted to structure, and shellfish aquaculture can provide a diversity of habitat. Therefore, the impact of longlines and rack-and-bag structure on fish populations is considered less than significant, with a beneficial impact for some fish species.

Bio-A6: Changes in the Abundance of Suspended Organic Matter and Related Effects on Native Species. Cultured shellfish consume natural food sources that are suspended in the water column, including phytoplankton and other organic matter and there is potential competition for this food source between cultured shellfish and other filter feeders. An analysis was conducted to assess the potential cumulative effect on organic matter food sources of the proposed Project, existing culture, and other planned culture in Humboldt Bay (Attachment B). The analysis, based on Gibbs' (2007) model, considered the inlet total volume, tidal exchange volume, the mean clearance rate of cultured shellfish, mean phytoplankton biomass, phytoplankton production, and cultured shellfish biomass to determine potential impacts. The analysis considered the Project, the Humboldt Bay Mariculture Pre-Permitting Project, a project proposed by the District (the "Pre-permitting Project") to expand shellfish aquaculture in Humboldt Bay, as well as existing and other proposed shellfish culture. The Pre-Permitting Project would include 526 acres of new intertidal shellfish culture leases and approximately 21.2 acres of new subtidal shellfish culture leases.

The analysis considered three different ways to evaluate the cumulative impact to organic particulate matter food resources: (1) the effectiveness of shellfish in processing bay water during feeding, as compared to tidal flushing (clearance efficiency); (2) consumption of phytoplankton-derived carbon by shellfish as compared to the total carbon generated by phytoplankton in the bay (filtration pressure); and how fast phytoplankton are turning over (doubling time) compared to their consumption by shellfish (regulation ratio). The study includes several conservative assumptions, such as assuming that the entire intertidal portion of the Pre-Permitting Project will consist of rack-and-bag operations (which relates to the highest biomass of cultured shellfish) and assuming that shellfish are constantly feeding. Additionally, nutrient recycling by the shellfish is not considered, where excreted inorganic nutrients can be taken up by phytoplankton directly or regenerated by bacteria into inorganic nutrients that can

stimulate phytoplankton growth.

While the clearance efficiency calculations indicate that shellfish filtration could exceed the bay's flushing rate if the most conservative flushing rate estimate is used, this does not evaluate the impact on carbon and phytoplankton within the bay. The filtration pressure and regulation ratio analyses, which take into account the impact on available phytoplankton, indicate that Humboldt Bay is highly productive and this productivity can withstand substantial cultivated shellfish density without significantly affecting food resources available to other organisms in the bay. The results of the study indicate that the Project and Pre-Permitting Project would have some cumulative effect on bay conditions, but that food resources are likely abundant enough that wild species would not be significantly affected. Therefore, this potential impact is considered less than significant.

Bio-A7: **Effects to Western Snowy Plover Foraging Habitat.**. In the Humboldt Bay region, western snowy plovers primarily breed and winter in ocean-fronting beaches (Brindock and Colwell 2011) although small numbers of plovers have been documented nesting in gravel bars of the Eel River (Colwell et al. 2011). Nonbreeding western snowy plovers are not expected to occur in intertidal habitats in Humboldt Bay; however individuals may occasionally forage in the bay, particularly in the South Bay where sandier substrates occur south of the bay entrance. Therefore aquaculture expansion areas represent habitats that will be used infrequently, if at all, by western snowy plovers, and those areas will mainly remain available to foraging shorebirds. Thus, the aquaculture expansion project is expected to have a less than significant impact on western snowy plovers. No critical habitat for western snowy plovers has been designated within the interior of Humboldt Bay (77 FR 36727) and thus the project will not affect critical habitat for this species and no impact is expected.

Bio-A8: **Effects to Roosting California Brown Pelicans.** California Brown pelicans (*Pelecanus occidentalis californicus*) and other waterbirds, including double-crested cormorants (*Phalacrocorax auritus*) and terns (*Sterna* spp.), use docks, rafts, and other structures in Humboldt Bay as roosting habitat. Brown pelicans and other species may occasionally use the FLUPSY, and other infrastructure associated with the project's aquaculture operations. During maintenance and harvesting, project personnel will access the structures causing roosting pelicans and other birds to abandon their roosts. These disturbances have energetic costs associated with flight while searching for alternative roost sites. However, roost sites are not limited in Humboldt Bay due to the abundance of docks and other structures that receive limited (or no) human disturbance. Therefore it is expected that birds will locate to alternative roost sites when flushed from aquaculture infrastructure and they will generally avoid areas that receive frequent (i.e., daily) human disturbance such as FLUPSYs. This impact is considered less than significant.

Bio-A9: Effects to Benthic Fauna. Shellfish culture may affect benthic species by altering sedimentation patterns and through benthic pelagic coupling. Hosack et al. (2006) found that structured habitats (both eelgrass and oyster aquaculture) supported more diverse and dense populations of epibenthic and benthic invertebrates. Similarly, a study completed by the Western Regional Aquaculture Center (Rumrill and Poulton 2004) in Arcata Bay found that the "overall similarity of the invertebrate communities among the oyster long line and eelgrass reference sites provides evidence that oyster long line culture activities are not particularly stressful to the benthic infaunal communities of Arcata Bay." Hence, this impact is considered less than significant.

Additionally, anchors and posts will displace benthic habitat used by animals, including polychaetes, crustaceans and mollusks. Benthic habitat that will be temporarily displaced by Project equipment is used for foraging by bird and fish species. Current shellfish culture equipment in Humboldt Bay covers approximately 0.76 acres of the bottom (the "benthic footprint") with post, anchors, etc. Structures in the bay not related to shellfish culture (e.g., docks and piles) have not been inventoried well and it is difficult to estimate the benthic footprint of these structures. However, these structures can be characterized as "scattered" along the shoreline and don't appear to occupy a substantial proportion of benthic area in the bay. The Project would allow for approximately 1.03 acres of additional benthic footprint, including posts and stakes associated with intertidal culture operations. Hence, the total benthic footprint of existing and proposed Project shellfish culture equipment would be approximately 1.79 acres (which is in addition to the unknown benthic footprint created by non-culture related structures). This represents approximately 0.02% of the 7,795 acres of Arcata Bay. Due to the relatively small spatial extent of this benthic footprint, this impact is considered less than significant without mitigation.

Bio-A10: Fouling Organisms and Nonnative Species. Coast is a participant in a disease prevention program, the Shellfish High Health Program, sponsored by the Pacific Coast Shellfish Growers Association (PCSGA). Coast conducts disease examination of all species cultured annually by a USDA certified Shellfish Pathologist. All import of bivalve larvae and seed to Humboldt Bay are done under a permit issued by CDFW, and exports are permitted by cooperating state or foreign governments. All species cultured will be mono-culture from a certified hatchery that cultures only species licensed by the California Department of Fish and Wildlife. Therefore, there is very little risk of new non-native species being introduced through the cultivation of seed.

The species to be cultivated, Pacific and Kumomoto oysters, are already cultivated by Coast on its existing footprint in the Bay and have been cultivated in Humboldt Bay for decades without evidence of invasive spread or propagation in the bay to the detriment of other species or habitat. They are the two species most commonly cultivated in California for commercial shellfish projects, and have been successfully grown and harvested in California for over a century. While both species are non-native, they are prevalent throughout California and the California Department of Fish and Wildlife does not consider them to be invasive non-native species.

The project has the potential to provide additional substrate for both native and non-native fouling organisms on the installed structures. To avoid the spread of such organisms on the FLUPSYs, the applicant has incorporated BMP-1 into the project design, which requires that all bio-fouling organism removal operations for the FLUSPY bins be carried out onshore and that all biological materials removed during cleaning operations will be disposed of at an upland facility. Daily washing of the FLUPSY trays and wells generally prevents their colonization by fouling organisms. The rafts themselves do not require regular maintenance to remove fouling organisms, although periodic maintenance on an annual or greater timeframe may be used, depending on site conditions.

While longlines provide less surface area for fouling organisms to accumulate, they will be checked during monthly inspections and any non-native fouling organisms will be removed during maintenance or harvest and deposited at an upland facility. The continuous movement and maintenance of rack-and-bag culture makes it unlikely that significant amounts of fouling organisms will accumulate on rack-and-bag equipment.

Boyle et al. (2006) evaluated the role of exotic species and larval settlement in Humboldt Bay. The study concluded that the initial phases of settlement of new surfaces were dominated by colonial and solitary ascidians, byrozoans and hydroids, almost all of which were introduced to Humboldt Bay. However, rainstorms, which brought fresh water and heavy sediment loads into the bay each winter, lead to the sudden disappearance of many of these invasive species and over time native species, such as mussels, sponges and tubiculous amphipods gradually increased in abundance, perhaps due to their tolerance to heavy sediment loads. Further, several studies have shown that there are numerous causes for the introduction of invasive species in the bay that are completely unrelated to shellfish culture, including international shipping (Barnhardt et al. 1992, Boyd et al. 2002). Based on the information above, the Project would have a less than significant impact regarding the introduction of non-native invasive species.

Bio-B: Effects to Habitats. Shellfish culture is proposed to occur within seven habitats (Table 1), as mapped by NOAA Coastal Services (2009).

Eelgrass (*Zostera marina*) forms a Federal Habitat Area of Particular Concern which is a subset of federal Essential Fish Habitat that provides important ecological functions and/or is especially vulnerable to degradation. Eelgrass beds are also recognized as a conservation concern by local and state agencies, including the California Department of Fish and Wildlife, California Coastal Commission, City of Eureka and the District. In 2009, Humboldt Bay contained 3,614 acres of continuous eelgrass beds and an additional 2,031 acres of patchy eelgrass beds (Schlosser and Eicher 2012). Although monitoring is sporadic for various locations throughout California, the eelgrass in Humboldt Bay represents up to 53% of California's eelgrass resource (Ramey, pers. comm., 2012). The majority of continuous eelgrass beds are located in South Bay (84% occupied) compared to North Bay (39% occupied)(Gilkerson (2008)). A variety of environmental factors limit eelgrass growth in the bay, including light and suspended sediments; wind and wave exposure; nutrients; sea surface temperature; space competition; and herbivory. Despite these limiting factors, observed eelgrass cover has remained relatively constant over the past several decades, although there is a significant degree of interannual variability from year to year. The prevalence of eelgrass in Humboldt Bay may indicate that it is reaching its carrying capacity, with limited opportunity for additional growth without some form of habitat modification.

As shown in Table 1, the Project includes cultivation within 531 acres mapped as dense eelgrass (≥85% eelgrass cover) and 68 acres mapped as patchy eelgrass (>10% to <85% eelgrass cover) by NOAA Coastal Services (2009).

The project incorporates best management practices (See BMP 2-5 in the Project Description above) to minimize eelgrass impacts. In addition to these BMPs, Coast Seafoods Company is committing to the following spacing of shellfish culture equipment and BMPs, which will further minimize eelgrass impacts:

- For Cultch-on-Longline equipment, spacing between the lines would be four lines spaced 2.5 feet apart and an open row of 10 feet and then repeated (NMFS 2011).
- For Basket-on-Longline equipment, groups of three lines would be spaced three feet apart, with a 20 foot space between each group.
- Rack-and-Bag equipment would not be placed in eelgrass.

Attachment A provides a thorough description of the known ecological functions of eelgrass and shellfish culture and the relationships between these two ecosystem components. Longlines and rack-and-bag culture placed in eelgrass has the potential to impact eelgrass, due to shading and spatial competition. However, as further described in Attachment A, studies of shellfish aquaculture in Willapa Bay, Washington, an estuary similar in many ways to Humboldt Bay, have shown a less than significant impact to eelgrass from shellfish aquaculture when analyzed at the landscape scale. Further, studies in both Willapa Bay and Humboldt Bay have indicated that 5-ft and 10-ft longline spacing has potentially beneficial effects to eelgrass, and at the very least minor negative effects. The Project will employ a spacing regime that several agencies, including the National Marine Fisheries Service and Washington Department of Natural Resources, have recommended as an appropriate conservation measure to minimize impacts to eelgrass, based on Rumrill and Poulton's (2004) work evaluating longline spacing in Humboldt Bay."

As described in Attachment A, to comply with the CEMP and ensure eelgrass impacts are minimized, Coast Seafoods Company would develop and implement an eelgrass monitoring and adaptive management plan (Mitigation Measure Bio-2). Through this plan, if effects occur beyond a set threshold, then they would be avoided or minimized to be less than significant for continued operations. The adaptive management plan will compare ecological functions as they relate to eelgrass and aquaculture to ensure that no net loss of ecological function results. Evidence of loss would result in either operational changes (e.g. change in longline spacing) or compensatory mitigation (e.g. restoration of habitat to allow eelgrass to expand). The concepts in the CEMP will be utilized in the adaptive management plan, including pre- and post-project surveys in comparison to reference areas.

With implementation of the above BMPs, equipment spacing and Mitigation Measure BIO-2, impacts to eelgrass and other habitats listed in Table 1 are considered less than significant.

Table 1. Acres of habitat where expanded intertidal shellfish culture will occur under the Project (habitat data based on mapping by NOAA Coastal Services (2009)).

Habitat Type	Acres
Eelgrass (≥85% cover)	531.2
Patchy Eelgrass (>10% to <85% cover)	67.8
Macroalgae	0.5
Unconsolidated Sediment	14.5
Subtidal*	7.6
Total	621.8

*Subtidal areas within the Project area consist of small channels extending into intertidal areas where culture is proposed.

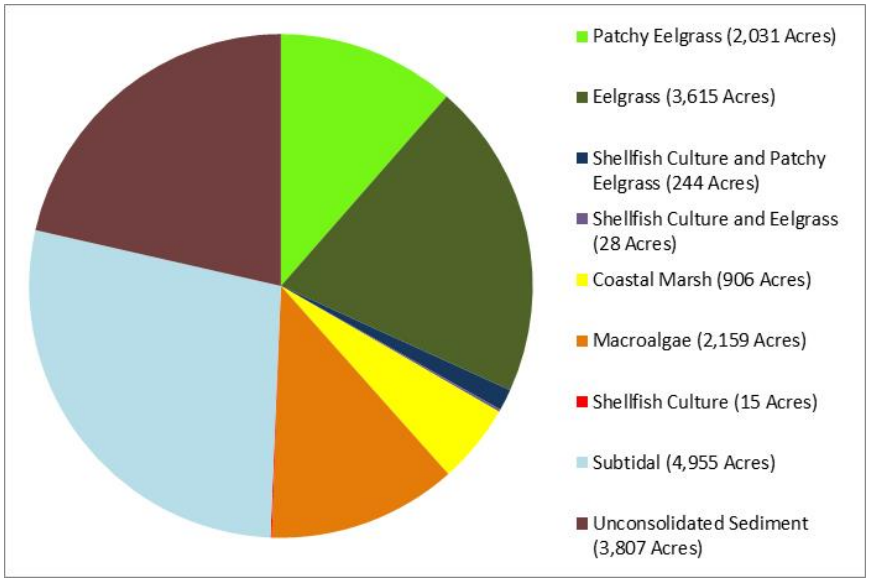

Figure 1. Acres of subtidal and intertidal habitats in Humboldt Bay, California (based on data from NOAA Coastal Services, 2009)

Bio-C: Effects to Wetlands. Wetlands, including in Humboldt Bay, provide numerous functions including primary production, flood protection, nutrient removal/transformation, wildlife habitat and recreational opportunities. With the addition of shellfish culture, all these functions continue. Cultured shellfish can actually contribute to water quality by removing/converting nutrients and other matter in the water column. Additionally, as described in other sections of this Initial Study, certain wildlife species benefit from the habitat provided by shellfish culture equipment and cultured shellfish. Also see Attachment A regarding the functions of eelgrass habitat. The Project does not include the removal of any wetlands, placement of fill, or any other interruption or impact to wetland areas other than as described in Attachment A regarding the placement of shellfish aquaculture structure in eelgrass habitat. Based on the information above and in Attachment A, the Project is not expected to have a significant impact on wetlands.

Bio-D1: Effects to Wintering and Migrating Shorebird Populations. Humboldt Bay is an important area for migrating and wintering shorebirds in the Pacific flyway, and the bay has been designated as an International site in the Western Hemisphere Shorebird Reserve Network. During bay-wide surveys, as many as 32 shorebird species and 83,647 individuals have been recorded during spring migration (April 1991) although shorebird counts conducted during the 1990's reflect a substantial decline relative to historic estimates (Colwell 1994). Aquaculture practices have the potential to reduce the amount of available foraging habitat for shorebirds through habitat degradation and human disturbance (Colwell 1994). For instance, a study on wintering shorebirds conducted in Tomales Bay suggests that some shorebird species will avoid aquaculture areas (Kelly et al. 1996). Foraging resources for waterbirds are altered in two primary ways by shellfish culture: (1) cultured animals and associated bio-fouling organisms can be a food source to birds (Caldow et al. 2007, Forrest et al. 2009), and (2) habitats and thus food resources below culture operations can be altered.

Connolly and Colwell (2005) compared waterbird abundance, diversity and composition between cultch-on-longline oyster plots and adjacent tidal flats in Humboldt Bay during low tides. The results indicate

greater bird species diversity on long-line oyster plots than on the tidal flats without oyster culture (i.e., control plots), although there was variation in species use of long-line and control plots. Where differences occurred, five species (willet (*Tringa semipalmata*), whimbrel (*Numenius phaeopus*), dowitchers (*Limnodromus griseus* and *L. scolopaceus*), small sandpipers (*Calidris* spp.), and black turnstone (*Arenaria melanocephala*)) were more abundant on longline plots than control plots during the study (Connolly and Colwell 2005). The authors suggest that increased abundance of these shorebirds on long-line plots was potentially related to increased foraging opportunities or an increase of prey density or diversity. However, one species (black-bellied plover (*Pluvialis squatarola*)) was more abundant on control plots. The authors suggest that greater use of control plots by black-bellied plovers may be a result of greater abundance of their principle prey items occurring on control plots, or factors related to reduced foraging efficiency related to their visual foraging methods. For instance, prey may be less available to black-bellied plovers, due to higher concentrations of shorebirds attracted to the long-lines, or prey may be less detectable due to visual obstructions in long-line plots.

Based on this study, the short-term effect of increased aquaculture will likely be negligible or possibly beneficial for most shorebird species, but some species (e.g., black-bellied plover) may avoid long-line areas. Of the available low-tide foraging habitat in Humboldt Bay for species such as black-bellied plovers, the 622 acres of aquaculture expansion represents a small proportion of available foraging habitat, as the majority of the expansion (i.e., 531 acres) will occur in areas of dense eelgrass (Table 1) in relatively low areas (i.e., approximately 1.5 ft MLLW) in the intertidal zone. These areas are available for a small (e.g., less than one quarter) period of each day and plovers and other shorebirds likely concentrate their foraging use along the edge of the receding or incoming waterline, where invertebrates are most exposed and foraging efficiency is likely highest. Therefore, the aquaculture expansion is unlikely to have a substantial adverse effect on shorebird populations and is considered less than significant.

Bio-D2: Effects to Pacific Herring. Pacific herring spawn on eelgrass in Humboldt Bay and can spawn on shellfish culture equipment. Maintenance of shellfish culture equipment has the potential to disturb spawning herring and herring eggs. Spawning Pacific herring will be avoided, as described in BMP-9 above, by postponing harvesting and planting activities for two weeks on beds where spawning has occurred (see project description). Hence, this effect is considered less than significant.

Bio-D3: Effects to Marine Mammals. As described above, harbor seals occur in Humboldt Bay and are known to haul out on mudflats in Arcata Bay. California sea lions also occur in Humboldt Bay and occasionally are observed loafing on artificial structures. These marine mammals are expected to primarily use channels for movement and foraging rather than the intertidal areas where long-lines will be placed, thus the placement of infrastructure is not expected to occur in areas important to their movement. Further, even if moving through intertidal areas during high tides, shellfish culture equipment is not expected to restrict movements of marine mammals, as these species would readily navigate among the equipment.

The Project also incorporates BMP-6, which requires the applicant to educate its workforce regarding marine mammal avoidance and implement procedures to avoid marine mammals when using boats in Humboldt Bay, including incorporating speed restrictions, avoidance techniques, and notification requirements should the crew observe an injured marine mammal. Therefore, impacts to the movement of marine mammals are expected to be less than significant.

Bio-D4: Effects to Black Brant. Humboldt Bay is an important wintering area and spring staging site for black brant (*Branta bernicla nigricans*) in the Pacific flyway. Based on peak use, Humboldt Bay is the most important spring staging site in California and the fourth most important site in the Pacific flyway (Moore et al. 2004). Annual estimates of total use-days ranged from 1 to 6 million use-days before 1954, but since have usually been less than 1 million and reached a low of 285,000 use-days in 1985 (Moore and Black 2006a). The total Pacific Flyway brant population is considered to be stable with approximately 120,000 individual birds (Pacific Flyway Council 2002). During a two-year study, Humboldt Bay was estimated to support 28% of the flyway population (37,600 birds) in 2000 and 58% (77,800 birds) in 2001 (Lee et al. 2007). Although "wintering" brant are generally considered winter residents of the Bay, the resident brant population in January and early February has not been shown to be static, with 3 to 8% turnover per week until 15 February (Lee et al. 2007). The mean stopover duration for all birds in winter and spring (January – April) was estimated to be 13 days (Lee et al. 2001). Thus in a given year a substantial proportion of the population relies on Humboldt Bay during migration.

Black brant feed almost exclusively on eelgrass (Ward et al. 1997, 2005; Moore et al. 2004) and a large proportion of the flyway population uses the bay likely due to high eelgrass abundance and its relative isolation from other suitable spring staging sites (Moore et al. 2004). The South Bay contains 78 to 95% of the total eelgrass biomass (Harding and Butler 1979, as cited in Moore and Black 2006b). The South Bay also contains gritting sites for brant, which are an essential habitat component for the species (Spragens et al. 2013). Based on 10 February brant counts conducted between 1976 and 2000, the mean number of brant occurring in the South Bay was 5,049, or 83% of the Humboldt Bay brant population, and the mean number in Arcata Bay was 1,322 (or 17%). Therefore the abundance of brant in each area appears to be correlated with eelgrass abundance (Moore et al. 2004). Based on comparisons with historical data (1931-1941), the relative proportions of brant using the South Bay and Arcata Bay have not changed (Moore et al. 2004), suggesting there has not been a significant shift in eelgrass distribution during that time (i.e., since the inception of the aquaculture industry).

Eelgrass varies in quantity and quality, and is unavailable during two high tides per day, making the achievement of energy demands challenging for the brant (Clausen 2000, Moore and Black 2006b). However, in most years there is no evidence that overall eelgrass abundance has been insufficient to support wintering and staging brant in Humboldt Bay. There is anecdotal evidence that in certain uncommon circumstances, brant have had limited access to eelgrass in Humboldt Bay and, although their non-breeding diet is restricted almost exclusively to eelgrass, brant have been observed in salt marshes and pastures in such years (Moore et al. 2004). Eelgrass shortages have been documented to occur in the winter spring of the years 1937/38, 1940/41, 1951/52, 1952/53, 1957/58, and 1997/98 (various sources as cited in Moore et al. 2004). The most recent circumstance (1997/98) where eelgrass was unavailable was hypothesized to be due to a long storm duration coupled with a tide cycle that did not allow for eelgrass exposure at low tide, as opposed to any reduction in eelgrass quantity or quality (G. Dale pers. comm.). However, there were no notable declines in brant use of Humboldt Bay in 1997/98 or other years where eelgrass was lacking in the bay (Moore et al. 2004). This may be because the estuary is relatively isolated from others in the Pacific Flyway and brant were thus required to meet their energetic needs prior to moving to another estuary (i.e., by using other food sources; Moore et al. 2005). Thus in most years, brant appear to meet their energetic requirements foraging on a relatively abundant and stable source of eelgrass, but in rare circumstances weather and tide conditions can

constrain foraging efforts. Overall, hunting pressure likely has a greater effect on brant use (and declines in population) in the bay than the overall quality or quantity of eelgrass (Moore and Black 2005).

During the past winter/spring, annual surveys conducted by the Humboldt Bay National Wildlife Refuge detected a substantial reduction in brant numbers in South Bay, where all surveys are focused (unpublished data, P. Gabriel pers. comm.). It is possible that brant may have shifted their distribution northward within Humboldt Bay to areas that are not surveyed (i.e., to Arcata Bay) in response to hunting pressure or other factors related to habitat quality. Although formal surveys were not conducted, larger than normal flocks of brant were observed in Arcata Bay last winter where substantially smaller flocks were observed in previous years (B. Leigh pers. comm.). It is also possible that fewer brant are relying on Humboldt Bay, as new habitats become available or habitat quality increases in other areas. For instance, winter brant numbers are increasing in Alaska, particularly in Izembek Lagoon, due to warming temperatures and fewer freezing days due to climate warming (Ward et al. 2009). Brant have been shown to shift their winter and spring distributions along the flyway previously, without substantial changes in their overall population levels (Moore and Black 2006a). Thus, the importance of Humboldt Bay to the brant population can change, and currently may be changing, due to factors of habitat quality outside the bay, in particular availability of eelgrass in northern portions of the flyway.

The Project's aquaculture expansion is proposed to occur on 622 acres of intertidal habitat in Arcata Bay. The majority of this expansion will involve increased off-bottom oyster culture on 531 acres of eelgrass habitat with dense (≥85%) cover, with approximately 68 acres occurring on patchy eelgrass (Table 1) (NOAA 2009). Off-bottom shellfish culture techniques allow for oyster culture to be held off of the substrate allowing for eelgrass to grow under culture equipment and between rows of culture. The Project will employ a spacing regime that several agencies, including the National Marine Fisheries Service and Washington Department of Natural Resources, have recommended as an appropriate conservation measure to minimize impacts to eelgrass, based on Rumrill and Poulton's (2004) work evaluating longline spacing in Humboldt Bay."(See Attachment A for further detail).

While there is no available literature on the subject, it is possible that brant may avoid areas with culture present (i.e., structures suspended over eelgrass) and increased human disturbance (i.e., the presence of culturists and boats), as brant are known to be sensitive to human disturbance as a hunted species. However, they may gradually adapt to the presence of aquaculture, particularly given that longlines, aquaculture gear, and other infrastructure are common existing structures in the bay. The likelihood of avoidance is less within the 10-foot rows spaced between every four longlines, which likely provides enough room for brant to take off and land. Brant may be wary of foraging under the more closely-spaced long-lines, but brant would continue to have access to those areas.

Even if brant are wary of foraging under longlines, there will remain an available food resource in aquaculture expansion areas and throughout Humboldt Bay (particularly in South Bay where no aquaculture expansion is planned). While brant may be required to expend additional energy to relocate to areas without aquaculture structure, no observed population declines has been observed relative to eelgrass abundance or distribution in the bay. Therefore, in most years the species' ability to achieve energetic demands by foraging on eelgrass is not expected to be impeded. In rare circumstances when eelgrass may be less abundant or available either due to poor water quality conditions or high water levels, the species' potential wariness to forage within the Project footprint may contribute to their

difficulty in achieving energetic demands for migration and breeding. In those conditions, brant may forage in other, less suitable habitats within the bay or to seek other estuaries for food. However, under such conditions it is likely that brant would forage in the Project footprint, even if wary of the infrastructure or occasionally flushed by culturists.

Overall, it is unlikely that the Project will limit brant foraging such that it would result in detectable population-level decreases due to foraging restrictions and related potential impacts. Therefore, with the implementation of the proposed spacing regime and Mitigation Measure Bio-2 (Develop and Implement an Eelgrass Monitoring and Adaptive Management Plan), which will minimize eelgrass impacts within the Project footprint, the Project's impact on brant is considered less than significant.

Further, the Pacific Flyway Management Plan for Pacific Brant includes management triggers to reduce hunting pressure if the population (which has remained stable) is reduced. For instance, if the population (based on a 3-year average) is reduced to 90,000 to 110,000 birds, a 50% reduction in harvest will be enacted, and if the population is reduced to less than 90,000 birds, the harvest will be restricted (Pacific Flyway Council 2002). Therefore, although the Project may contribute to cumulative effects to brant by potentially reducing foraging, population reductions in brant are expected to be avoided through monitoring and adaptive management by the Pacific Flyway Council.

Bio-E: Local Policies. In the vicinity of the Management Area, numerous riparian habitats and other sensitive natural communities have been identified by local governments, CDFW, and USFWS. These natural communities provide habitat for year-round and migrant species, recreation, environmental interpretation, and preservation of aesthetic resources. The City of Arcata's Marsh and Wildlife Sanctuary also provides wastewater treatment. Specific areas managed by local, state or federal entities protecting riparian habitats and other sensitive natural communities include:

- The Humboldt Bay National Wildlife Refuge Complex, owned and managed by the USFWS. http://www.fws.gov/humboldtbay/
- The Arcata Marsh and Wildlife Sanctuary, owned and managed by the City of Arcata. http://www.cityofarcata.org/departments/environmental-services/water__wastewater/wildlife-sanctuary
- CDFW Wildlife Areas, at the following locations http://www.dfg.ca.gov/lands/wa/region1/index.html: South Spit WA, Eel River WA, Fay Slough WA, Mad River Slough WA, Elk River WA

Plans protecting biological resources in the vicinity of the Project are Local Coastal Plans, the Open Space Element of the County General Plan, habitat conservation plans (HCPs), and recovery plans for listed species that are likely to occur within the Management Area.

Local Coastal Plans and other relevant documents include:

- City of Arcata Certified Local Coastal Program, http://www.cityofarcata.org/departments/building-planning/regulations/certified-local-coastal-program
- Humboldt Bay Area Plan of the Humboldt County Local Coastal Program, April 1995, http://co.humboldt.ca.us/planning/local_coastal_plans/hbap/hbap.pdf

- Eel River Area Plan of the Humboldt County Local Coastal Program, May 1995, http://co.humboldt.ca.us/planning/local_coastal_plans/erap/erap.pdf
- Local Coastal Plan Issue Identification Report, September 2003, http://co.humboldt.ca.us/planning/local_coastal_plans/pdf/issueidentificationreport/issue.pdf
- Humboldt Bay National Wildlife Refuge Comprehensive Conservation Plan 2009, http://www.fws.gov/humboldtbay/ccp.html

The County of Humboldt's Coastal plan policies call for providing maximum public access and recreational use of the coast; protecting wetlands, rare and endangered habitats, environmentally sensitive areas, tidepools, and stream channels; maintaining productive coastal agricultural lands; directing new development to already urbanized areas; protecting scenic beauty; and locating coastal energy facilities such that they have the least impact.

The County of Humboldt General Plan is currently being updated. The Biological Resources section of the Conservation and Open Space Elements describes the policies for preservation of natural resources, management of production of resources, outdoor recreation, and public health and safety.

In the general vicinity of the Management Area, HCPs, Natural Community Conservation Plans (NCCPs), and candidate conservation agreement and assurances plans have been written, but none geographically overlap the Project area.

The Project, with inclusion of best management practices, would not conflict with described policies. Hence, there would be no impact.

Bio-F: Conservation Plans. There are no adopted or planned Habitat Conservation Plans or Natural Community Conservation Plans for the Project Area. Hence, there would be no impact.

Mitigation Measure Bio-1, Water Intake Screening: The California Department of Fish and Wildlife has developed screening criteria to protect juvenile longfin smelt in bays and estuaries from impingement or entrainment by water intakes (Pers. Comm. Ms. Vicki Frey (CDFW Marine Region), email to Adam Wagschal (H. T. Harvey & Associates), March 18, 2014). These criteria also allow for protection of juvenile salmonids, as based on criteria developed by the NMFS (2008). These criteria, which will be followed by all water intakes under the Project, are as follows:

- Round or square (measured diagonally) openings in intake screens shall not exceed 2.38 mm (3/32 in).
- Slotted opening in the screen shall not exceed 1.75 mm (.0689 in).
- Approach velocity shall not exceed .2 feet per second for self-cleaning screens or .05 feet per second for non-self-cleaning screens.
- Overall screen porosity shall be a minimum of 27%.

Mitigation Measure Bio-2, Develop and Implement an Eelgrass Monitoring and Adaptive Management Program. Prior to installation of any additional shellfish aquaculture gear, the Harbor District shall approve an eelgrass monitoring plan, utilizing the concepts of the California Eelgrass Mitigation Policy, including pre- and post-project surveys in comparison to selected reference area(s). Baseline studies of eelgrass density and cover will be conducted prior to placement of new shellfish

culture equipment. In consultation with the resource agencies, thresholds will be set for project impacts to eelgrass ecological function. Eelgrass monitoring will occur during farming operations and if the established thresholds are exceeded then appropriate mitigation will be implemented. Mitigation measures may include alteration of the Project footprint; modification to aquaculture practices (possibly including alteration of culture spacing); creation of eelgrass habitat and/or establishment of conservation easements over eelgrass beds. Any such mitigation will be compliant with the CEMP, Army Corps of Engineers regulations regarding aquatic vegetation mitigation, and any regional eelgrass mitigation policy adopted by the Harbor District or other authorized regional entity.

V. CULTURAL RESOURCES. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?		X		
B) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		X		
C) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
D) Disturb any human remains, including those interred outside of formal cemeteries?		X		

DISCUSSION

CR-A through CR-D: **Cultural Resources.** Humboldt Bay is the ancestral heartland of the Wiyot Indians, whose native language is affiliated with the Algonquian language family and who had occupied the bay area for at least 2.000 years by the time the first European maritime explorers entered the bay and the first American towns were established in 1850. There are hundreds of known and undiscovered archaeological sites around Humboldt Bay that evidence Wiyot history and prehistory. Today, citizens of Wiyot ancestry are affiliated with three federally-recognized tribes located in the ancestral homeland: Blue Lake Rancheria; Bear River Band of the Rohnerville Rancheria; and the Wiyot Tribe at Table Bluff Reservation.

A number of State and Federal historic preservation laws, regulations and policies address the need to manage potentially significant and/or sensitive (e.g., human remains) archaeological and Native American resources discovered inadvertently and in "post-review" settings. These include:

- CEQA: Requires analysis by the Lead Agency, to determine if the proposed project will cause a significant impact to "historical resources" including archaeological and Native American sites.
- Section 106 of the National Historic Preservation Act (NHPA): Requires analysis by the Lead Federal Agency (that provides funding or a permit for the "undertaking") and consultation with the California State Historic Preservation Officer (SHPO), Advisory Council on Historic Preservation (ACHP), culturally affiliated Native American Tribes, and others, as appropriate, to "resolve adverse effects" on "historic properties" including archaeological and Native American sites.

Several laws and their implementing regulations spell out evaluation criteria to determine what constitutes a significant 'site' or a significant 'discovery' during construction:

- California Register of Historical Resources criteria (California Code of Regulations, Title 14, Chapter 3, Section 15064.5), for archaeological and Native American resources qualifying for consideration under CEQA.
- National Register of Historic Places criteria (36 CFR 63), qualifying for consideration under Section 106 review and NEPA.

State laws call for specific procedures and timelines to be followed in cases when human remains are discovered on private or non-Federal public land in California. It includes penalties (felony) for violating the rules for reporting discoveries, or for possessing or receiving Native American remains or grave goods:

- Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code (PRC) outline requirements for handling inadvertent discoveries of human remains, including those determined to be Native American and associated grave goods found on private or state lands (i.e., the Project area), and PRC 5097.99 (as amended by SB 447) specifies penalties for illegally possessing or obtaining Native American remains or associated grave goods.

Posts and stakes placed in the substrate to secure shellfish culture equipment could potentially disturb cultural and historical resources. Additionally, such resources could be discovered visually by culturists in the areas they work. Mitigation Measures CR-1 and CR-2 provide protocols for actions that will occur if cultural resources are discovered. With these mitigation measures the potential impacts to cultural and historic resources are less than significant.

Mitigation Measure 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.

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, Coast 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.
6. In cases where a known or suspected Native American burial or human remains are uncovered, the Humboldt County Coroner (707-445-7242) shall <u>also</u> be notified immediately.
7. Ground-disturbing project work at the find locality shall be suspended temporarily while Coast, 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 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.

Mitigation Measure 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 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.

VI. **GEOLOGY AND SOILS**. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X	
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?				X
B) Result in substantial soil erosion or the loss of topsoil?				X
C) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
D) Be located on expansive soil, as defined by the California Building Code (2007), creating substantial risks to life or property?				X
E) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X

DISCUSSION

Geo-A: Risks to People or Structures. There are numerous fault lines near the Project area, as well as the intersection of three tectonic plates. As such, the area is highly susceptible to seismic activity. However, the Project would not add any fixed structures to the landscape that would be susceptible to seismic damage, nor would it put existing structures at greater risk. The Project area is level and lacks structures that could become unstable and injure culturists. The soil could be subject to liquefaction, which would pose a minor risk to culturists; however, the risk is considered very low, given that (1) liquefaction of the type that would be a risk to culturists is uncommon, and there is no historical evidence of liquefaction in Humboldt Bay; (2) culturists would be at the Project sites only temporarily, and no people would inhabit the Project sites; and (3) culturists would be in or near boats and have safety equipment, including personal floatation devices. Hence, impacts related to seismic risks are expected to be less than significant.

Geo-B: Erosion. Through a study of sedimentation at shellfish culture sites in Humboldt Bay similar to the proposed Project sites and facilities (Rumrill and Poulton 2004) found that "fine sediments were deposited and eroded in an inconsistent manner." However, based on the study results, there appears to be a net increase in sediment accumulation, not a loss, at these mariculture operations. A minor amount of net sediment deposition, rather than erosion, is expected when shellfish culture equipment is placed in tidelands. Hence, no impact is expected.

Geo-C: Instability. The Project would not involve the construction of any permanent structures, and is not expected to affect the potential for onsite or offsite landslides, lateral spreading, subsidence, liquefaction, or collapse. Hence, no impact is expected.

Geo-D: Expansive Soils. There may be expansive soils in the Project area; however, the Project would not add enclosed or habitable structures (buildings) to the landscape; therefore, there would be no substantial risk to life or property from Project development. Hence, no impact is expected.

Geo-E: Wastewater Disposal. The Project does not involve the development of new waste water disposal systems. Culturists employed through the Project would use existing facilities (restrooms) at Coast Seafoods Company's processing plant, which has adequate waste water capacity. Hence, no impact is expected.

VII. **GREEN HOUSE GAS EMISSIONS**. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
B) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?				X

DISCUSSION

GHG-A: Greenhouse Gas Emissions. Greenhouse gas emissions would result from the use of small internal combustion engines associated with up to four boats that would be used for the Project. However, the amount of greenhouse gases generated by these activities would be less than significant.

GHG-B: Plans, Policies, or Regulations Regarding Greenhouse Gases. State of California legislation (Senate Bill 375 and Assembly Bill 32) seeks to reduce greenhouse gas emissions through the practice of smart-growth or mixed-use development. The Project does not include any upland construction or mobile sources (other than the four boats described above) that could be a potentially significant source of greenhouse gas emissions. Therefore, the Project would not conflict with plans, policies, or regulations on greenhouse gas emissions. Hence, no impact is expected.

VII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
B) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
C) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
D) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
E) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
F) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
G) Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
H) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized area or where residences are intermixed with wildlands?				X

DISCUSSION

Haz-A through Haz-C: Transport, Use, Release, or Emission of Hazardous Materials. The only hazardous materials that would be associated with the Project are boat fuel and lubricants. Use of these materials is common in Humboldt Bay and does not represent a significant hazard to the environment or people. Project personnel would follow all current and standard safety and cleanup protocols for fueling and lubricating engines. To further minimize the potential for spills, BMPs 7 and 8 (see Project Description above) will be followed. Hence, these impacts are less than significant.

Haz-D: Known Hazardous Sites. The Project area is not known to be on any list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Because the Project sites are intertidal and subtidal, it is unlikely that they supported historical uses that would have resulted in contamination. There are contaminated sites located on the margins of the bay, but hazardous materials are not expected to reach the Project sites at concentrations that would have any impact on the

Project's culturists. Hence, no impact is expected.

Haz-E and Haz-F: Aircraft/Airport-related Safety. The only nearby airport is Murray Field, which is a public airport approximately 0.9 miles from the nearest Project boundary. Airplanes landing and departing from this airport are not expected to be a hazard for the Project's culturists. Hence, no impact is expected.

Haz-G and Haz-H: Emergency Response and Fire Hazards. The Project would not have any effect on an adopted emergency response plan or emergency evacuation plan, because it would not impede emergency response or evacuation routes or procedures. Also, because the Project area is in intertidal and subtidal (aquatic) areas, there is no risk of wildfires. Hence, no impacts are expected.

VIII. HYDROLOGY AND WATER QUALITY. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Violate any water quality standards or waste discharge requirements?			X	
B) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
C) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on or off-site?			X	
D) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?				X
E) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
F) Otherwise substantially degrade water quality?			X	
G) Place housing within a 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary of Flood Insurance Rate Map or other flood hazard delineation map?				X
H) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows?				X
I) Expose people or structures to a significant risk or loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X	
J) Result in inundation by seiche, tsunami, or mudflow?				X

DISCUSSION

Hyd-A: Water Quality and Discharge Standards. The Project would not involve waste discharge. No additives, feed, or chemicals will be used in project operations (other than fuel for the boats). Changes to water quality would be minor, particularly with implementation of BMPs 7 and 8 (see project description above) and would not violate any water quality standards. Hence, the impact is considered less than significant.

Hyd-B: Groundwater. The Project would not involve the use of groundwater. Hence, no impact is expected.

Hyd-C: Erosion and Siltation. Oyster culture has a localized effect on sediment distribution and tidal

circulation. As water is slowed by frictional effects of the culture structure, sediment deposition and organic content increases (Rumrill and Poulton 2004). A study of sedimentation at cultch-on-longline sites in Humboldt Bay (Rumrill and Poulton 2004), which are similar to proposed Project sites, found that "fine sediments were deposited and eroded in an inconsistent manner." The greatest elevation change was an increase of 95 mm. Localized changes of this magnitude would not have an adverse effect on the environment. Hence, this impact is considered less than significant.

Hyd-D: Flooding. The Project will occur entirely in intertidal and subtidal areas of Humboldt Bay. Therefore, the Project will not result in any surface runoff or flooding. Hence, no impact is expected.

Hyd-E: Runoff. The Project would not create any runoff water. Hence, no impact is expected.

Hyd-F: Water Quality. Project activities will temporarily mobilize a minor amount of sediment. For example, when stakes are placed or a vessel comes in contact with the bay bottom, sediment may be mobilized. However, the amount of sediment mobilized during mariculture operations is likely very low compared to the quantities of sediment mobilized during stormy conditions (e.g., strong winds). There is also potential for release of hazardous materials from internal combustion engines. However, particularly with implementation of BMPs 7 and 8 (see project description above), water quality impacts are not expected to substantially degrade water quality. Furthermore, shellfish are filter feeders which have been found to have a positive impact on water quality. Ecosystem modeling and mesocosm studies indicate that restoring shellfish populations to even a modest fraction of their historic abundance could improve water quality and aid in the recovery of seagrasses (Newell and Koch 2004). While it is unknown if culture in Humboldt Bay is beneficial to water quality, the effect of culture on water quality is not adverse. Hence, the impact is considered less than significant.

Hyd-G and Hyd-H: 100-year Floods. The Project would not involve constructing housing or structures susceptible to flooding impacts, nor would the Project facilities (e.g., upwelling bins) impede floodflows. Hence, no impacts are expected.

Hyd-I: Risks to People from Flooding. The Project area is prone to tsunamis. The Project culturists working in the bay would be at greater risk of injury or death from a tsunami than people on land. However, the overall risk to the culturists is considered minor, because (1) tsunamis are infrequent, (2) culturists only temporarily work in the bay, and (3) there are warning systems in place in Humboldt County that would likely alert culturists of the potential for a tsunami so that they can evacuate the area. Hence, this impact is considered less than significant.

Hyd-J: Tsunamis. No activities associated with the Project would result in a seiche, tsunami, or mudflow. Hence, no impact is expected.

IX. LAND USE AND PLANNING. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Physically divide an established community?				X
B) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
C) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

DISCUSSION

Land-A: Division of Community. The Project involves expanding mariculture operations in Humboldt Bay. It would not divide a community. Hence, no impact is expected.

Land-B: Land Use Policy Conflicts. The Project area is zoned as follows:

- Portions of the Project area within unincorporated Humboldt County jurisdiction are zoned as Natural Resources with Coastal Wetlands (Humboldt County Code §§313-5.4, 313-38). Aquaculture is a conditionally permitted use within this zoning designation.
- Portions of the Project area within the City of Eureka's jurisdiction are zoned Conservation Water. Aquaculture is an allowable conditional use within this designation. The City's General Plan similarly permits shellfish farms in waters under the City's jurisdiction (City of Eureka General Plan, Chapter 6 § 6.A.14). A use permit from the City of Eureka will be obtained for the Project.
- The District's *Humboldt Bay Management Plan* designates the intertidal portion of the Project area for conservation and mariculture and the subtidal portion for harbor uses (Humboldt Bay Management Plan § 2.2); however, the Project area is also designated as a Mariculture subarea. The Management Plan permits mariculture operations within the entire Project area, noting that the "use of the Bay for aquaculture or mariculture is expected to remain primarily within Arcata Bay, which includes areas that have been leased previously by the District, the cities, or the State of California for mariculture purposes . . . The combining use designation reflects a determination in this Plan that mariculture activities are generally appropriate within the designated area" (Humboldt Bay Management Plan § 2.3.2). The Project is also consistent with the plan's goal of supporting commercial aquaculture and the plan's policy to identify additional aquaculture activities (Policy HFA-5). The plan recognizes the need to balance harbor, recreation, conservation and mariculture uses of the bay.

In summary, the Project would be consistent with zoning and adopted plans for the Project area as a permitted or conditionally permitted use. Hence, no impact is expected.

Land-C: Habitat Conservation Plans (HCPs) or Natural Community Conservation Plans (NCCPs). There are no adopted or planned HCPs or NCCPs for the Project area. Hence, no impact is expected.

X. MINERAL RESOURCES. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?				X
B) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

DISCUSSION

Min-A and Min-B: Mineral Resources. The Project would expand mariculture operations in Humboldt Bay. It would have no effect on mineral resources. Hence, no impact is expected.

XI. NOISE. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
B) Expose persons to or generate excessive ground borne vibration or ground borne noise levels?				X
C) Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
D) Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?				X
E) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
F) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

DISCUSSION

Noise-A through Noise-F: Noise. The Project would involve expanding mariculture operations on Humboldt Bay. Its primary noise effect would be caused by the addition of up to four small watercraft with internal combustion engines. These would generate noise similar to that generated by other small watercraft on the bay. The Project boats could not be heard from sensitive receptors. Because the Project's noise generation would be typical of what already occurs in Humboldt Bay, no noise impacts are expected.

XII. **POPULATION AND HOUSING**. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and/or businesses) or indirectly (e.g., through extension of roads or other infrastructure)?				X
B) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
C) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

DISCUSSION

Pop-A through Pop-C: Population and Housing. The Project would involve expanding mariculture operations on Humboldt Bay. It is not expected to have any effect on population and housing. It may create as many as 50 new jobs, but those jobs are expected to be filled primarily by people who already live in the region. Hence, no impacts are anticipated.

XIII. **PUBLIC SERVICES**. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Fire protection?				X
B) Police protection?				X
C) Schools?				X
D) Parks?				X
E) Other public facilities?				X

DISCUSSION

Pub-A through Pub-E: Public Services. The proposed Project would not create increased demand for public services. Approximately 50 people would be employed; they would likely already live in the local community and so would not represent a new burden on public services. Hence, no impacts are expected.

XIV. **RECREATION**. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
B) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

DISCUSSION

Rec-A and Rec-B: Recreation. The Project would not increase use of recreational facilities and does not include recreational facilities. Approximately 50 people would be employed by the Project, but they would likely already live in the local community and so would not represent a new burden on recreational facilities. Hence, no impacts are expected.

XV. **TRANSPORTATION/TRAFFIC**. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				X
B) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				X
C) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?				X
D) Substantially increase hazards due to design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
E) Result in inadequate emergency access?				X
F) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			X	

DISCUSSION

Trans-A through Trans-F: Traffic Levels, Patterns, and Hazards. The Project would not increase the local population. Up to 50 culturists employed under the Project would park at Coast Seafoods Company's existing processing facility, in nearby public parking that is available along 1st Street where the facility is located or in other nearby areas of Eureka. Coast's existing facilities include 30 parking spaces and there is ample parking available for new employees. Hence, no impact is expected.

Trans-F: Alternative Transportation. The proposed Project's mariculture equipment could interfere with the movement of watercraft (e.g., boats, kayaks) in intertidal areas. This interference would occur only when the tides are high enough for watercraft to move through the intertidal areas, but so low that that the vessels can't move readily over the equipment. Empty space among the equipment would allow smaller watercraft (e.g., kayaks) to move about, but in some cases only in two directions (e.g., parallel to rows of equipment). Watercraft movement in subtidal areas, including in the primary navigation channels for watercraft, would not be affected. Because this impact would occur only during certain tide heights and is limited to areas outside of navigation channels (i.e., in intertidal areas where boating activity is limited), the impact is considered less than significant.

XVI. UTILITIES AND SERVICE SYSTEMS. Would the project:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
B) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
C) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
D) Have insufficient water supplies available to serve the project from existing entitlements and resources (i.e., new or expanded entitlements are needed)?				X
E) Result in a determination by the wastewater treatment provider, which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
F) Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
G) Violate any Federal, State, and local statutes and regulations related to solid waste?				X

DISCUSSION

Util-A through Util-E: Wastewater and Stormwater. Project employees would use the restrooms at Coast Seafoods Company's existing processing plant. The Project would not discharge wastewater or stormwater or involve consumption of water. Hence, no impact is expected.

Util-F and Util-G: Solid Waste. The Project would generate waste that would go to a landfill. This waste would include rope from cultch-on-longline culture operations and other disposable materials. Local landfills would have the capacity to accept this relatively small amount of waste. The Project would maintain compliance with federal, State, and local statutes and regulations related to solid waste. Hence, no impacts are expected.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE.	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
A) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
B) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects).		X		
C) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?				X

DISCUSSION

Findings-A: No. With the mitigation measures described above, the Project would not degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory.

Findings-B: No. As generally described above and in Attachments A and B, shellfish culture activities do not intrinsically have significant environmental effects and the assessment above is applicable within the context of current and other planned activities in Humboldt Bay. Reduction of organic particulate matter in the water column is of specific interest in light of this Project and other planned shellfish culture projects in the bay, especially the Humboldt Bay Mariculture Pre-Permitting Project which would also increase the number of cultured shellfish. However, an assessment of cumulative effects on organic particulate matter (Attachment B) indicates that there won't be a significant cumulative environmental effect on the availability of particulate organic matter. With the mitigation measures described above the potential cumulative impacts will be less than significant.

Findings-C: No. The Project involves the expansion of shellfish culture and no aspect of the Project is expected to cause substantial adverse effects on human beings, either directly or indirectly.

Section 5.0 Reference List

Angliss R.P. and B.M. Allen. 2009. Alaska marine mammal stock assessments, 2008. Seattle, WA: U.S. Department of Commerce. NOAA Technical Memorandum NMFS-AFSC-193.

Bemis, W.E. and B. Kynard. 1997. Sturgeon rivers: an introduction to acipenseriform biogeography and life history. Environmental Biology of Fishes, 48: 167-183

Billard R and G. Lecointere. 2001. Biology and conservation of sturgeon and paddlefish. Review of Fish Biology and Fisheries 10 : 355-392.

Bottom, D. L., K. K. Jones, T. J. Cornwell, A. Gray, and C. A. Simenstad. 2005. Patterns of Chinook salmon migration and residency in the Salmon River estuary (Oregon). Estuarine Coastal and Shelf Science 64(1):79-93. doi:10.1016/j.ecss.2005.02.008

Boyle M., D. Janiak and S. Craig. 2006. Succession in a Humboldt Bay marine fouling community: the role of exotic species, larval settlement and winter storms. Proceedings of the 2004 Humboldt Bay Symposium. Humboldt Bay Harbor, Recreation and Conservation District. 601 Startare Drive, Eureka, CA 95501.

Brindock, K.M. and M.A. Colwell. 2011. Habitat selection by western snowy plovers during the nonbreeding season. Journal of Wildlife Management 75:786-793.

Burns, J.J. 2008. Harbor seal and spotted seal Phoca vitulina and P. largha. In: Perrin WF, Wursig B, Thewissen JGM, editors. The encyclopedia of marine mammals. San Diego, CA: Academic Press; p. 533-542.

Caldow R.W.G., R.A. Stillman, S. Durell, A.D. West, S. McGrorty, J.D. Goss-Custard, P.J. Wood and J. Humphreys. 2007. Benefits to shorebirds from invasion of a non-native shellfish. Proceedings of the Royal Society of Biological Sciences 274.

California Fish and Game Commission. 2009. Staff summary, meeting of February 5, 2009.

Carretta JV, Forney KA, Lowry MS, Barlow J, Baker J, Johnston D, Hanson B, Muto MM, Lynch D, Carswell L. 2009. U.S. Pacific marine mammal stock assessments: 2008. U.S. Department of Commerce. NOAA-TM-NMFS-SWFSC-434.

[CSC] 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.

Clausen, P. 2000. Modeling water level influence on habitat choice and food availability for Zostera feeding brant geese Branta bernicla in non-tidal areas. Wildlife Biology 6:75-87.

Colwell, M.A. 1994. Shorebirds of Humboldt Bay, California: Abundance estimates and conservation implications. Western Birds 25:137-145.

Colwell, M.A., J. J. Meyer, M.A. Hardy, S.E. McAllister, A.N. Transou, R.R. LeValley, and S.J. Dinsmore. 2011. Western snowy plovers Charadrius alexandrinus nivosus select nesting substrates that enhance egg crypsis and improve nest survival. Ibis 153:303-311.

Confluence Environmental Company (CEC) and Plauché & Stock LLP. 2011. Coast Seafoods Company Clam Raft Expansion Project: Negative Declaration. Prepared for the Humboldt Bay, Harbor, Recreation and Conservation District, Eureka, CA.

Connolly, L.M. and M.A. Colwell. 2005. Comparative use of longline oysterbeds and adjacent tidal flats by waterbirds. Bird Conservation International 15:237-255.

Dumbauld, B.R., J.L. Ruesink, and S.S. Rumrill. 2009. The ecological role of bivalve shellfish aquaculture in the estuarine environment: a review with application to oyster and clam culture in West Coast (USA) estuaries. Aquaculture 290(3-4):196-223.

Eguchi T, J.T. Harvey. 2005. Diving behavior of the Pacific harbor seal (Phoca vitulina richardii) in Monterey Bay, California. Marine Mammal Science. 21(2):283-295.

Eldridge, M.B. and C.F. Bryan. 1972. Larval fish survey of Humboldt Bay, California. NOAA Technical Report NMFS SSRF-665.

Forrest, B.M., N.B. Keeley, G.A. Hopkins, S.C. Webb and D.M. Clement. 2009. Bivalve aquaculture in estuaries: review and synthesis of oyster cultivation effects. Aquaculture 298: 1-15.

Fritzsche, R.A. and P. Collier. 2001. Surfperches. Pp. 236-240. *In* California's living marine resources: a status report. W.S. Leet, C.M. Dewees, R. Klingbeil and E.J. Larson eds. California Dept. of Fish and Game. 592 pp.

Gaskin DE. 1984. The harbour porpoise (Phocoena phocoena L.): regional populations, status, and information on direct and indirect catches. Reports of the International Whaling Commission. 34:569-586.

Gibbs, M.T. 2007. Sustainability performance indicators for suspended bivalve aquaculture activities. Ecological Indicators 7:94-107.

Goetz BJ. 1983. Harbor porpoise (Phocoena phocoena, L.) movements in Humboldt Bay, California and adjacent ocean waters [master's thesis]. [Arcata, CA]: Humboldt State University.

Harding, L.W. and J.H. Butler. 1979. The standing stock of production of eelgrass, Zostera marina, in Humboldt Bay, California. California Fish and Game 65:151-158.

(HBHRCD) Humboldt Bay Harbor, Recreation and Conservation District. 2007. Humboldt Bay Management Plan. Final.

Heath CB, Perrin WF. 2008. California, Galapagos, and Japanese Sea Lions, Zalophus californianus, Z. wollebaeki, and Z. japonicus. In: Perrin WF, Wursig B, Thewissen JGM, editors. The encyclopedia of marine mammals. San Diego, CA: Academic Press; p. 170-176.

Hosack, G.R., B.R. Dumbauld, J.L. Ruesink, and D.A. Armstrong. 2006. Habitat associations of estuarine species: comparisons of intertidal mudflat, seagrass (Zostera marina), and oyster (Crassostrea gigas) habitats. Estuaries and Coasts 29:1150-1160.

(HTH) H. T. Harvey & Associates. 2014. Annual report regarding Coast oyster elevation study. H. T. Harvey &Associates, 1125 16th Street, Suite 209, Arcata, CA 95521.

Jacques, D. L., C. S. Strong, and T. W. Keeney. 1996. Brown pelican roosting patterns and responses to disturbance at Mugu Lagoon and other nonbreeding sites in the Southern California Bight. University of Arizona Cooperative Park Studies Unit Technical Report No. 54

Kelly, J. P., J. G. Evans, R.W. Stallcup, and D. Wimpfheimer. 1996. Effects of aquaculture on habitat use by wintering shorebirds in Tomales Bay, California. California Fish and Game 82:160-174.

Lee, D.D. 2001. Immigration, emigration, stopover duration, and volume of black brant migrating through Humboldt Bay, California. Master's thesis. Humboldt State University, Arcata, California.

Lee, D.E., J.M. Black, J.E. Moore, and J.S. Sedinger. 2007. Age-specific stopover ecology of black brant at Humboldt Bay, California. Wilson Journal of Ornithology 119:9-22.

Lindley, Steven T. , Erickson, Daniel L. , Moser, Mary L. , Williams, Greg , Langness, Olaf P. , McCovey Jr., Barry W. , Belchik, Michael , Vogel, Dave , Pinnix, William , Kelly, John T. , Heublein, Joseph C. and Klimley, A. Peter(2011) 'Electronic Tagging of Green Sturgeon Reveals Population Structure and Movement among Estuaries', Transactions of the American Fisheries Society, 140: 1, 108 — 122, First published on: 25 February 2011 (iFirst)

Love, M.S., P. Morris, M. McCrae and R. Collins. 1990. Life history aspects of 19 rockfish species (Scorpaenidae: *Sebastes*) from the Southern California Bight. NOAA Technical Report NMFS 87. US Department of Commerce.

Lowry, M.S., J.V. Carretta, and K.A. Forney. 2008. Pacific harbor seal census in California during May-July 2002 and 2004. California Fish and Game. 94(4):180-193.

Lowry MS, Carretta JV. 1999. Market squid (Loligo opalescens) in the diet of California sea lions (Zalophus californianus) in southern California (1981-1995). California Cooperative Oceanic Fisheries Investigations Reports. 40:196-207.

Lowry MS, Forney KA. 2005. Abundance and distribution of California sea lions (Zalophus californianus) in central and northern California during 1998 and summer 1999. Fishery Bulletin. 103(2):331-343.

Lowry MS, Stewart BS, Heath CB, Yochem PK, Francis JM. 1991. Seasonal and annual variability in the diet of California sea lions (Zalophus californianus) at San Nicolas Island, California, 1981-86. Fishery Bulletin. 89(2):331-336.

Moore, J.E. and J.M. Black 2006a. Historical changes in black brant Branta bernicla nigricans use on Humboldt Bay, California. Wildlife Biology 12:151-162.

Moore, J.E. and J.M. Black. 2006b. Slave to the tides: spatio-temporal foraging dynamics of spring staging black brant. Condor 108:661-677.

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.

(NMFS) National Marine Fisheries Service. 2008. Anadromous passage facility design criteria. National Marine Fisheries Service Northwest Region. www.nwr.noaa.gov

(NMFS) National Marine Fisheries Service. 2011. RE: Initiation of Endangered Species Act Section 7 Programmatic Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Nationwide Permit 48 Activities in Washington State. Letter to Michelle Walker, U. S. Army Corps of Engineers, Seattle, WA. Dated April 26, 2011. Accessed 20 January 2014. http://www.co.thurston.wa.us/permitting/hearing/agenda-staff-report/shellfish-hearing/mdns/2.pdf.

Nelson, S.K. 1997. Marbled Murrelet (Brachyramphus marmoratus). In A. Poole and F. Gill, (eds) The Birds of North America, No. 313 (The Academy of Natural Sciences, Philadelphia, PA and the American Ornithologists' Union, Washington, D.C.Page, G.W, L.E. Stenzel, J.C. Warriner, and P.W.C. Paton. 1995. Snowy plover (Charadrius alexandrinus). In A. Pool and F. Gill, editors. The birds of North America. No. 154. The Academy of Natural Sciences, Philadelphia, PA and American Ornithologists' Union, Washington, DC.

Pacific Flyway Council. 2002. Pacific Flyway Management Plan for Pacific Brant. Prepared for the Pacific Flyway Council.

Page, G.W, L.E. Stenzel, J.C. Warriner, and P.W.C. Paton. 1995. Snowy plover (Charadrius alexandrinus). In A. Pool and F. Gill, editors. The birds of North America. No. 154. The Academy of Natural Sciences, Philadelphia, PA and American Ornithologists' Union, Washington, DC.

Pinnix, W.D., P.A. Nelson, G. Stutzer, K.A. Wright. 2013. Residence time and habitat use of coho salmon in Humboldt Bay, California: an acoustic telemetry study. Environmental Biology of Fish DOI 10.1007/s10641-012-0038-x

Rumrill, S. S., and V. K. Poulton. 2004. Ecological Role and Potential Impacts of Molluscan Shellfish Culture in the Estuarine Environment of Humboldt Bay, CA. Annual Report, Western Regional Aquaculture Center. Oregon Department of State Lands, South Slough National Estuarine Research Reserve, and Estuarine and Coastal Science Laboratory. 44 pp.

Shields, M. 2002. Brown pelican (Pelecanus occidentalis), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/609

Spragens, K.A. E.R. Bjerre, and J.M Black. 2013. Black brant Branta bernicla nigricans grit acquisition at Humboldt Bay, California, USA. Wildfowl Special Issue 3: 104-115.

Sullivan RM. 1980. Seasonal occurrence and haul-out use in pinnipeds along Humboldt County, California. Journal of Mammalogy. 61(4):754-760.

Sutula, M., J.N. Collins, A. Wiskind, C. Roberts, C. Solek, S. Pearce, R. Clark, A.E. Fetscher, C. Grosso, K. O'Connor, A. Robinson, C. Clark, K. Rey, S. Morrissette, A. Eicher, R. Pasquinelli, M. May and K. Ritter. 2008. Status of Perennial Estuarine Wetlands in the State of California. Final report to the Surface Water Ambient Monitoring Program, State Water Resources Control Board. Technical Report 571. Southern California Coastal Water Research Project. Costa Mesa, CA.

Tallman J, C. Sullivan. 2004. Harbor seal (phoca vitulina) predation on a male harlequin duck (histrionicus histrionicus). Northwestern Naturalist 85(1):31-32.

Toft, J.D., J.R. Cordell, C.A. Simenstad and L.A. Stamatiou. 2007. Fish distribution, abundance and behavior along city shoreline types in Puget Sound. North American Journal of Fisheries Management 27: 465-480.

(USFWS) U.S. Fish and Wildlife Service. 1992. Determination of Threatened Status for the Washington, Oregon, and California Population of the Marbled Murrelet. Final rule. U.S. Fish and Wildlife Service. Federal Register Vol. 57. No. 191:45328-45337. October 1, 1992.

(USFWS) U.S. Fish and Wildlife Service. 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (Charadrius alexandrinus nivosus). U.S. Fish and Wildlife Service. Sacramento, CA.

(USFWS) U.S. Fish and Wildlife Service. 2011. Revised Critical Habitat for Marbled Murrelet. U.S. Fish and Wildlife Service. Federal Register Vol. 76. No. 193:61599-61621. October 5, 2011.

Ward, D.H., E.A. Rexstad, J.S. Sedinger, M.S. Lindberg, and N.K. Dawe. 1997. Seasonal and annual survival of adult Pacific brant. Journal of Wildlife Management 61:773-781.

Ward, D.H., A. Reed, J.S. Sedinger, J.M. Black, D.V. Dirkson, and P.M. Castelli. 2005. North American brant: effects of changes in habitat and climate on population dynamics. Global Change Biology 11:869-880.

Ward, D.H., C.P. Dau, T.L Tibbitts, J.S. Sedinger, B.A. Anderson, and J.E. Hines. 2009. Change in abundance of Pacific brant wintering in Alaska: evidence of a climate warming effect? Arctic 62:301-311.

Weise MJ. 2000. Abundance, food habits, and annual fish consumption of California sea lions (Zalophus californianus) and its impact of salmonid fisheries in Monterey Bay, California [M. S.]. [San Jose, CA]: San Jose State University.

Personal Communications

Dale, Greg. Email communication to Adam Wagschal of H. T. Harvey & Associates. 12 December 2014.

Frey, Vicki. California Department of Fish and Wildlife, Marine Region. Email to Adam Wagschal of H. T. Harvey & Associates. 18 March 2014.

Gabriel, Pia. Verbal communication to Scott Demers of H. T. Harvey & Associates. 4 December 2014.

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