Appendix B:

IS Comments Received

Draft IS:

- Ducks Unlimited
- Frank Shaughnessay, PhD, Joe Tyburczy, PhD, Jeffrey M. Black PhD (Humboldt State University Department of Biological Sciences)
- Steven Grantham
- Stephen Rosenberg
- Stan Brandenburg
- Oceana, Audubon California, Redwood Region Audubon Society, and Earthjustice
- Humboldt Baykeeper, Northcoast Environmental Center, and Ecological Rights Foundation
- National Marine Fisheries Service, CAPES Program
- California Department of Fish and Wildlife
- North Coast Regional Water Quality Control Board
- California Waterfowl Association
- Carol Ross and Walter Moorhead
- James S. Sedinger
- California Coastal Commission
- Multiple Commenters (Help Protect Migratory Birds)
- Public Comment Meeting Summary with Powerpoint presentation

Final IS & NOP:

- Oceana, Audubon California, Earthjustice
- Pacific Flyway Council
- Humboldt Baykeeper
- Pacific Fishery Management Council
- California Department of Fish and Wildlife
- Mark A. Colwell (Humboldt State University)

DUCKS UNLIMITED

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February, 26, 2015

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

Dear Mr. Crider:

Ducks Unlimited, Inc. respectively submits the following comments on the Initial Study: Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. While the Initial Study evaluated a suite of environmental impacts, we restricted our comments to the environmental impacts that were identified for Pacific black brant (Bio-D4), as well as material presented in section Bio-B (Effects to Habitats). Although the Initial Study concluded that "the Project's impact on brant is considered less than significant", we argue that an Environmental Impact Report (EIR) that further addresses the Project's impacts on brant is needed. We base this argument on our current understanding of black brant populations and their ecology, as well as assumptions made in sections Bio-D4 and Bio-B that relate to the Project's impacts on brant and eelgrass.

The Pacific Flyway Council has established a population objective of 150,000 black brant, as measured by the 3-year running average of the mid-winter waterfowl survey.[1] This population objective has not been met since the late 1960's[2], and black brant continue to be designated as a "Game Bird Below Desired Conditions" by the U.S. Fish and Wildlife Service.[3] As a result, careful consideration must be given to any action that may impact a large segment of the continental black brant population.

In fall, most brant migrate nearly non-stop from their main staging area in Izembek Lagoon, Alaska, to their wintering grounds in Mexico.[4] Although some brant do winter in Humboldt Bay, the Bay is critically important during spring migration. Brant begin to depart their Mexican wintering grounds in January, and nearly 60% of these birds stop in Humboldt Bay on their journey north.[4] In some years up to 75% of all brant winter in Mexico, meaning that 45% of the entire black brant population may use Humboldt Bay (0.6 * 0.75).[5] The fact that nearly half of all black brant rely on a single small site makes them unique among North American waterfowl. It also predisposes them to much greater risk.

Black brant have one of the most specialized diets of all goose species as they rely almost exclusively eelgrass during migration and winter. In fact the distribution of spring staging brant along the entire Pacific Coast is highly correlated with the abundance of eelgrass, with estuaries having the most eelgrass supporting the highest numbers of birds.[6] Estuaries that contain large amounts of eelgrass are

especially important in providing brant with the nutrients that are necessary for migration and reproduction.[7] Thus the Project's impact must be judged in the context of Humboldt Bay's continental importance to black brant, and the overwhelming importance of eelgrass in the diets of these birds.

The Project proposes to expand mariculture across 622 acres of intertidal habitat in Arcata Bay. Most of this expansion will involve long-line off-bottom oyster culture on 531 acres of eelgrass that is classified as having dense cover ($\geq$ 85%), with approximately 68 acres occurring on "patchy" eelgrass. Together these total 599 acres of eelgrass, or nearly 11% of the 5,646 acres of eelgrass now present in Humboldt Bay.*

The Project's impact on brant is likely to depend on three factors; 1) declines in the amount of eelgrass that result from 599 acres of additional mariculture, 2) the extent to which the infrastructure associated with off-bottom oyster culture discourages brant from feeding within the mariculture zone, and 3) the current "surplus" of eelgrass that exists in Humboldt Bay relative to brant needs. The amount of eelgrass could conceivably remain unchanged in the mariculture zone. However if the long-line structures on which oysters are grown discourage brant from feeding, then eelgrass within this zone may be rendered unavailable to brant regardless of any changes in biomass. Conversely, declines in eelgrass that result directly or indirectly from oyster framing may have little impact on brant if large surpluses of eelgrass exist. These three factors are explored in more detail below.

Although several studies have examined the impact of oyster farms on eelgrass, it is important to distinguish among farming practices (e.g. long line culture vs. bottom culture). The Project involves longline culture equipment spaced 2.5 feet apart and an open row of 10 feet and then repeated. This is identified as a Best Management Practice(BMP) in the Initial Study Report, and is based on Rumrill and Poulton's (2004)[8] work evaluating longline spacing in Humboldt Bay (Section Bio-B). However, a closer look at Rumrill and Poulton's work indicates that percent eelgrass cover and the density of eelgrass shoots was consistently lower in longlines spaced 2.5 feet apart then in control plots where no oyster farming infrastructure was present (see Figure 5 of their report)[8]. Moreover, Section Bio-B includes the statement " studies of shellfish aquaculture in Willapa Bay, Washington, an estuary similar in many ways to Humboldt Bay, have shown less than significant impact to eelgrass from shellfish aquaculture when analyzed at the landscape scale." We assume they are referring to the Tallis et al. (2009)[9] study titled "Oysters and Aquaculture Practices Affect Eelgrass Density and Productivity in a Pacific Northwest Estuary." In fact, that research concluded that longline oyster farming in Willapa Bay did significantly reduce eelgrass production in one of the study years.* We apologize if we have misinterpreted the use of these studies in the context of the Initial Study Report. However, we are not convinced that the impact of the Project on eelgrass will be "less than significant" as was concluded in Table 1 of the Initial Study.

Section Bio-D4 of the Initial Study openly recognizes that brant may avoid areas where longline structures are suspended over eelgrass bed, and that the species is sensitive to human disturbance. The impact of disturbance on waterfowl food supplies was addressed in a recent paper that examined habitat carrying capacity for migrating and wintering waterfowl. The paper concluded that "it is important for resource managers to understand how waterfowl separate themselves from

anthropogenic development and respond to disturbance , and how these factors influence their ability to extract critical food resources from habitats."[10] It seems prudent to follow this advice given that the Project will introduce a possible source of disturbance to 11% of all brant foraging habitat in Humboldt Bay. Future work is clearly needed here before the Project can proceed.

Finally, a recent study in Humboldt Bay estimated that a 10-30% reduction in eelgrass biomass could adversely affect the successful migration of birds through the Bay as birds struggled to gain body mass and increased their duration of stay.[5] The results of this study suggest that the surplus of eelgrass in Humboldt Bay is not great relative to brant needs. Moreover, the footprint of this project (11% of all eelgrass) falls within the 10-30% range identified by the study. Our room for error does not appear to be great.

In summary, Ducks Unlimited believes that an EIR that addresses the impact of long-line oyster cultures on eelgrass beds is needed with a special focus on the BMP adopted in the Initial Study (2.5 foot spacing among rows). Equally important, the EIR should evaluate if longline cultures represent a source of disturbance for brant that discourages birds from using eelgrass beds that lie within areas being farmed for shellfish.

We appreciate the opportunity to comment on the Initial Study Report.

Sincerely,

Mark Biddlecomb, Director
Western Region

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HUMBOLDT STATE UNIVERSITY
Department of Biological Sciences

16 February, 2015

To: Humboldt Bay Harbor Recreation & Conservation District

Re: Environmental Concerns about the Coast Seafoods Permit Initial Study

Dear Mr. Crider,

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

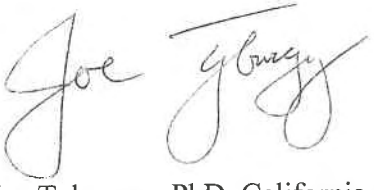
7. Brant and wigeon use of eelgrass in long line beds will be less than in paired control beds.

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

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

Sincerely,

Frank J. Shaughnessy, PhD, Professor of Botany



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

Jeffrey M. Black, PhD, Professor of Wildlife Biology

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

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

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

Dear Mr. Crider;

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

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

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

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

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

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

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

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

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

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

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

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

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

Sincerely,

Steven Grantham

Cc: DFW, CCC, CALWaterfowl.

February 21, 2015

Mr. Dan Berman
Director of Conservation
Humboldt Bay Harbor, Recreation and Conservation District
601 Startare Drive
Eureka, CA 9550I

Subject: Coast Seafood Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project

Dear Mr. Berman,

Will you please add my enclosed letter to the record of public comments concerning Coast Seafood's aquaculture expansion proposal.

Thank you.

Sincerely,

Stephen Rosenberg

Stephen Rosenberg
7160 London Drive
Eureka, CA 95503

February 21, 2015

Mr. Dan Berman
Director of Conservation
Humboldt Bay Harbor, Recreation and Conservation District
601 Startare Drive
Eureka, CA 9550l

Subject: Coast Seafood Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project

Dear Mr. Berman,

Over a decade ago oyster dredging and the concomitant dumping of cultch in North Bay was mandatorily eliminated due to well-documented damage to the eelgrass beds. At that time the production was changed over to above bed cultivation. Most of this is in the area west of Sand Island, near Bird Island and adjacent to the westerly portion of the east channel. The large eelgrass bed north of Bird Island and the largest on the bay's eastside remain largely undisturbed and have recovered significantly, thereby increasing brant and duck use.

The new proposal however, would concentrate new production almost entirely in this most important easterly bed. During the waterfowl season, at least 10,000 brant and ducks use the main beds for feeding and resting. The American widgeon and brant are almost exclusively eelgrass feeders. They are the two most abundant waterfowl species that winter here. It is well documented that if the brant are disturbed on their feeding grounds they do not gain enough weight to migrate to the arctic and successfully nest. Humboldt Bay is their most important staging area.

I have been hunting the bay for 60 years, have reviewed all the relevant literature on the subjects at hand and have seen firsthand the changes. The eelgrass beds are also spawning areas for herring and rearing areas for juvenile salmonoids. Protecting the large dense eelgrass beds is critical. The suspended operations, although not as damaging as dredging, also cause damage to the beds, create navigational hazards, and operations disturb the birds. The ultimate goal should be to reduce operations in North Bay, not expand them. There exist ample fringe areas for production away from the dense beds and alternate sites, particularly in the Fairhaven -Eureka areas. There is substantial abandoned infrastructure there that could be removed and replaced with oyster culture.

I am not against oyster culture in the bay, indeed as an attorney for 42 years I have clients in the business; however, protection of the dense eelgrass beds in North Bay is critical. Any argument that the protection of South Bay is adequate mitigation fails, because excessive human activity there in recent years has caused a shift in brant and duck use to North Bay, where human disturbance is less intense due to its large size, less hunting pressure and nonuse for activities such as crabbing, ocean access, clam digging and other recreational activities.

Thank you for considering my input.

Sincerely,

Stephen Rosenberg

Stephen Rosenberg
7160 London Drive
Eureka, CA 95503

February 20, 2015

Stan Brandenburg
P.O. Box 322
Cutten, CA 95534

Mr. Dan Berman
Director of Conservation
Humboldt Bay Harbor, Recreation and Conservation District
601 Startare Drive
Eureka, CA 95501

Subject: Coast Seafood Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project

Dear Mr. Berman,

As a lifelong resident of Eureka, former Coast Oyster Company employee, Commercial Fisherman, Logger, and Sportsman, I have participated in and observed the effects of oyster cultivation practice in North Humboldt Bay for over 40 years. Although I am not opposed to aquaculture, it is my opinion that Coast Seafood's proposed expansion should not be allowed and their existing aquaculture operations in North Humboldt Bay have reached their limit.

It is easily observed and well documented that above ground aquaculture is an extreme hazard to navigation, it severely impacts feeding and roosting activities of resident and migratory bird populations, it severely impacts herring spawning activities, it retards the growth of eelgrass, and it severely impacts recreational hunting, fishing and boating opportunities. Not so readily observable are the issues of phytoplankton limits and the effects of chemical leachates from plastics on water quality. And there are other questions concerning impacts to Leopard Sharks, California Halibut, and Northern Anchovies. Given these issues and an exhaustive list of others, at a minimum, the level of analysis for this proposal should be an Environmental Impact Report.

Environmental analysis aside, the glaring issue with Coast Seafood's proposal is its sustainability. The existing aquaculture footprint in North Humboldt Bay seems to have reached a delicate balance that is at a tipping point. As it stands now, most user groups are comfortable with the existing configuration. However, they are not comfortable with a 200% increase in production area. Coast's proposal is not sustainable, is exclusionary and precludes a variety of recreational users, fish and wildlife from historic and pre-historic use of North Bay.

Personally, I have lived through and participated in the collapse of the local timber and fishing industries. The citizens, fish and wildlife populations are still dealing with rotting infrastructure, degraded habitat, and the socioeconomic disaster from overcapitalization and unsustainable levels of harvest. Aquaculture is not exempt. The lesson here is just because we can expand production doesn't mean we should. Balance is key.

I understand Coast Seafood's desire to make money, but what happens when the brant or herring populations collapse because we have excluded them from their habitat, or there isn't enough plankton in the bay to feed all the clams and oysters and they die? Coast Seafood will walk away and the citizens, fish and wildlife will bear the brunt of a decades long or longer recovery period if recovery is possible. This pattern of overexploitation has to stop. It is poor stewardship. This proposal shares the same beginnings as the Great Dustbowl, the collapse of the Northwest Timber Industry, and the collapse of the Pacific Fishing industry. I have experienced firsthand the biological and emotional wreckage that follows overexploitation. Look around you; I know you see rotting piers, rotting pulp mills, rotting fish plants,

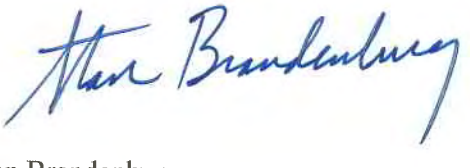
rotting locomotives. The ghosts of this rotting infrastructure haunts us continually, and we are still trying to clean up the mess and will be doing so for decades if not longer. Overexploitation is not just bad, it is ***unconscionable.***

Using 20% of North Humboldt Bay's eelgrass meadows for aquaculture production is a safe and reasonable number. 30% is questionable, but 70% is just wholesale greed and destruction and should not even be considered.

Coast Seafood is a good neighbor and an important part of our community and it is in everyone's interest to see them succeed. There are other areas of Humboldt Bay that could be developed for aquaculture that would not have such detrimental effects on recreation, fish and wildlife. A couple of suggestions: the footprint of the old log dump trestle behind the Bayshore mall. Pull the piles and convert this area to a permanent aquaculture location. There is room not only for seed rafts, but longline culture too. Another idea: The abandoned burnt out pier at Washington Street. Pull the piles, build a new pier in the existing footprint with concrete piles that have seed rafts, and structures for producing shellstock incorporated into the pile structures and perhaps a hatchery and processing plant on top. Give Coast a 50 year lease so they can make money and provide jobs. These areas need rehabilitation anyway, and what better way to re-claim our industrial waterfront. Additionally, having aquaculture so close to a urban area would actually protect Humboldt Bay by ensuring that we would have clean water because without good water quality, oysters are inedible and they die.

In closing I want to say this: The first rule of farming is that if you take care of the land, it will take care of you. This is an ancient observation that has been proven over eons by many different agricultural communities. Aquaculture is no different and Humboldt Bay is a prime location for growing oysters and clams, but there are limits. Please proceed judiciously.

Regards,



Stan Brandenburg

Audubon CALIFORNIA

EARTHJUSTICE
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REDWOOD REGION AUDUBON SOCIETY

February 23, 2014

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

Dear Director Crider and Commissioners:

On behalf of our members, we submit the following comments on the Initial Study: Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. While we recognize that shellfish aquaculture, when properly sited and sized, can be carried out in sustainable manner, we have significant concerns regarding the siting, size, and overall impacts of this project. We are concerned that the proposed project would significantly and adversely affect hundreds of acres of eelgrass as well as other key estuarine habitat in Humboldt Bay. Because this project is likely to have significant effects on the environment, the Harbor District must prepare a full Environmental Impact Report ("EIR") that analyzes the cumulative impacts that the project would likely have on the environment, as well as alternatives to avoid those impacts.

As explained below, eelgrass is a critically important plant and sensitive habitat that supports numerous fish and bird species, and we urge the Harbor District to reject any proposed expansion of mariculture operations into eelgrass habitat. We further recommend that the Harbor District consider any continued or expanded aquaculture operations in Humboldt Bay in a marine spatial planning framework[1] that makes avoidance of adverse impacts to eelgrass a primary management goal, consistent with federal and state policies and regulations, and that considers the impacts of sea-level rise and other anticipated consequences of climate change to the study area and surrounding communities.[2]

The proposed project would more than double the footprint of existing mariculture operations in the North Bay. This vast expansion is at odds with recent agency efforts to reduce mariculture impacts in this area, which only a few years ago required Coast Seafoods to reduce the footprint of its active operations from 500 acres to 300 acres. The proposed project would add 622 acres of operations, mostly located in eelgrass, likely resulting in the degradation or loss of as much as one third of the remaining eelgrass habitat in the North Bay. This project, together with the 550 acres of expanded mariculture proposed by the Harbor District itself[3], would nearly quadruple the size of mariculture operations in the North Bay and degrade or eliminate large portions of eelgrass and mudflat habitats. These impacts would harm numerous seabird, shorebird, and fish species, including a number of species protected under federal and state endangered species laws and species managed under the federal Magnuson-Stevens Fishery Conservation and Management Act.

The California Department of Fish and Wildlife ("DFW") has documented that this project will likely have unavoidable, significant environmental impacts on intertidal habitats and associated wildlife. We agree with the DFW's conclusion that the project likely would have unavoidable, significant impacts on the environment.[4] The Initial Study's conclusions that impacts to biological resources would be less than significant are not based on sufficient analysis or sound science. To the contrary, available information shows that the project would likely have unavoidable, significant, and unsustainable impacts to eelgrass and other sensitive habitats that support Pacific herring, brant and other waterfowl and shorebirds. These natural resources provide substantial aesthetic and economic value to the local area, California and the Pacific Flyway.

In sum, there is substantial information to indicate that the proposed project may cause significant impacts and is likely to substantially degrade the quality of the environment and substantially reduce the habitat for fish or wildlife species. Cal.Code Regs., tit. 14, §15065 (a)(1) (CEQA Mandatory Findings of Significance). Therefore, the Harbor District must prepare an EIR fully analyzing the project's impacts before it may consider moving forward.

Legal Background: California Environmental Quality Act

The California Environmental Quality Act ("CEQA") is intended to provide for the protection and enhancement of the state's environment and to "ensure that the long-term protection of the environment, consistent with the provision of a decent home and suitable living environment for every Californian, shall be the guiding criterion in public decisions." Pub. Res. C. § 21001(a)-(d). CEQA accomplishes these goals in part by ensuring that proposed projects are authorized only after their environmental impacts are thoroughly analyzed in an EIR, the public has full opportunity to inform that analysis, and necessary mitigation measures have been adopted.

CEQA therefore requires the preparation of an EIR "[i]f there is substantial evidence, in light of the whole record before the lead agency, that the project may have a significant effect on the environment." Pub. Res. C. § 21080(d). When the initial study indicates that the project will have potentially significant effects on the environment, the lead agency may only make a negative declaration if the applicant makes or agrees to revisions in the project plans that would avoid or mitigate the effects "to a point where *clearly* no significant effect on the environment would

occur, and . . . there is no substantial evidence, in light of the whole record before the lead agency, that the project, as revised, *may* have a significant effect on the environment." Pub. Res. C. § 21080(c)(2) (emphasis added); *see also* Cal. Code Regs., tit. 14, § 15064(f)(1) ("if a lead agency is presented with a fair argument that a project may have a significant effect on the environment, the lead agency shall prepare an EIR even though it may also be presented with other substantial evidence that the project will not have a significant effect.") CEQA defines "significant effect on the environment" as "a substantial, or potentially substantial, adverse change in the environment." Pub. Res. C. § 21068.

Currently, Humboldt Bay supports approximately 400 acres of oyster mariculture, most of which is cultivated using culch-on-longline (Figure 1) and bag-on-rack methods. The proposed Coast Seafoods project requires extending approvals for 289 acres of existing mariculture and permitting an additional 622 acres of intertidal and subtidal mariculture area. The majority of the proposed expansion – 531 acres – would occur in dense eelgrass (>84% cover); an additional 68 acres of the proposed expansion would occur in patchy eelgrass (<84% cover). (Figure 2). Up to 522 acres of the expanded area would be converted to culch-on-longline mariculture with a spacing of 2.5 feet between lines and 10 feet between each row. The remaining expansion area would be used for rack-on-bag or basket-on-longline gear culture. The total of the existing 289 acres of existing mariculture to be continued, and the 622-acre expansion, is 911 acres.

The Initial Study asserts that the project would have less than significant impacts with mitigation incorporated on special status species, riparian habitats and sensitive natural communities, wildlife corridors or nursery sites, and federally protected wetlands. It also asserts that the project would not conflict with local policies and ordinances protecting biological resources, or with approved local, state or regional habitat conservation plans.

These assertions are not consistent with the best available science or the laws and policies protecting the natural resources at issue. As described below, the Initial Study falls far short of demonstrating that this massive project would "clearly" have no significant effect on California's environment. As such, this proposed project must be analyzed in an EIR.

The Project Would Have Significant Impacts on Eelgrass (*Zostera marina*)

We strongly disagree with the Initial Study's conclusion that "with implementation of the above [best management practices], equipment spacing, and Mitigation Measure BIO-2, impacts to eelgrass and other habitats listed in Table 1 are considered less than significant." This conclusion is not supported by science. A published study evaluating oyster stake culture in Willapa Bay, WA, found that eelgrass in aquaculture areas had smaller plants (32% smaller) and lower production (70% lower production) than in uncultivated areas,[5] and these authors note that "most research to date has shown that eelgrass is less dense within aquaculture than at similar tidal elevations outside aquaculture areas." In Coos Bay, OR, oyster stake culture in an intertidal eelgrass meadow reduced eelgrass cover by 75% relative to nearby control areas.[6] In a subset of beds in Willapa Bay, eelgrass densities were approximately 60% lower in both long-line and dredged oyster beds relative to uncultivated areas.[7]

Furthermore, the Initial Study fails to present sound information demonstrating that the "best management practices" ("BMPs") it describes, including spacing equipment, controlling boat transit, avoiding shading, removing equipment from fallow areas, and avoiding shell deposition, are adequate to protect eelgrass.[8] For example, the Initial Study's assertion that the equipment spacing regime to be employed by the project has been recommended by "several agencies, including the NMFS and WA DNR . . . as an appropriate conservation measure to minimize impacts to eelgrass, based on Rumrill & Poulton's (2004) work evaluating longline spacing in Humboldt Bay" is not referenced or substantiated. Indeed, the results of Rumrill & Poulton (2004), a report that is neither peer-reviewed nor published, are compromised by pseudoreplication in the study methods[1] and other problems with experimental design. Therefore, this study does not provide a credible basis for finding that the proposed best management practices would result in less than significant harm to eelgrass.

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

Humboldt Bay contains approximately 5,646 acres of eelgrass, which represents between 45-53% of the state's total eelgrass.[9] Eelgrass is the dominant macrophyte of the shallow subtidal and lower intertidal zones. These eelgrass beds host more than 60% of the total brant population each year.[10] While highly productive, eelgrass is one of the rarest habitats in California. Collectively just five bays—Humboldt, San Francisco, San Diego, Mission, and Tomales—support more than 80% of the known eelgrass in the state. The uneven distribution of eelgrass resources increases the risk to this habitat and contributes to its dynamic nature. Further, the narrow depth range within which eelgrass can occur further places this habitat at risk in the face of global climate change and projected sea-level rise.

Eelgrass is highly productive and is considered to be a foundation or habitat-forming plant species. Eelgrass contributes to ecosystem functions at multiple levels: as a primary and secondary producer, habitat structuring element, substrate for epiphytes and epifauna, and a sediment stabilizer and nutrient cycling facilitator. Eelgrass provides important foraging areas and shelter to young fish and invertebrates, food for migratory waterfowl and sea turtles, and spawning surfaces for invertebrates and fish, such as Pacific herring. Indeed, eelgrass is an essential refuge, foraging, and spawning habitat for many marine species, including such economically valuable species as Pacific salmon, Pacific herring, and Dungeness crab.[11] Dungeness crab adults are found in subtidal or intertidal areas on sand, mud, or associated with eelgrass beds. Bare habitats are infrequently used by juveniles, most likely due to a lack of refuge from predation and decreased food abundance. Vegetated, intertidal estuaries appear to be important nursery habitats for young crabs.[12]

Eelgrass also is a source of organic carbon in estuarine and nearshore marine food webs, thus contributing to productivity beyond the eelgrass beds themselves. In addition, eelgrass has the capacity to sequester carbon in the underlying sediments and may help offset carbon emissions.[13]

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[1] Each experimental plot had a different "treatment," hence there was no replication of the "spacing" treatment. The four experimental plots appear to be adjacent to one another and are therefore insufficiently independent. ANOVA assumptions may be violated via unbalanced design and unequal population variance, as well as small sample sizes.

Maintaining and rehabilitating eelgrass habitat is clearly important to the quality of California's environment. This fact is underscored by the California Eelgrass Mitigation Policy ("CEMP"), developed and promulgated by the National Marine Fisheries Service ("NMFS"). The primary directive of the CEMP is to preserve existing eelgrass extent and function by avoiding development in eelgrass:

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

The CEMP further notes that "while improvements in eelgrass management have occurred overall, the importance of eelgrass both ecologically and economically, coupled with ongoing human pressure and potentially increasing degradation and losses associated with climate change, highlight the need to protect, maintain, and where feasible, enhance eelgrass habitat."[14] Unfortunately, Coast Seafoods has not chosen to avoidance impacts to eelgrass. Mitigation Measure BIO-2, to "develop and implement an eelgrass monitoring and adaptive management program, utilizing the concepts of the CEMP,"[15] fails to implement the CEMP's key directives and therefore is inconsistent with the CEMP.

The importance of protecting eelgrass is further reflected in state and federal regulations. California regulations prohibit cutting or disturbing eel grass.[16] Aquaculture leases produced by DFW reflect this regulation by including explicit language in lease agreements that eelgrass "may not be cut or disturbed."[17] DFW further requires a 10-foot buffer between the eelgrass and the aquaculture gear.[18] In Tomales Bay, aquaculture operations purposely have been sited to avoid eelgrass. In San Francisco Bay, the Subtidal Goals Project recommends protecting existing, established eelgrass beds by establishing eelgrass reserves.[19]

Federal fisheries management regulations protect eelgrass habitat due to its vital role in supporting commercially targeted fish populations. The Fishery Management Plan for the Pacific Coast Groundfish Fishery and regulations implementing essential fish habitat ("EFH") designations for this fishery include Humboldt Bay as a Habitat Area of Particular Concern ("HAPC") for Estuaries and for Sea Grass.[20] An HAPC is an area within designated EFH that is "rare, particularly susceptible to human-induced degradation, especially ecologically important, and/or located in an environmentally stressed area. HAPC designations are used to provide additional focus for conservation efforts."[21] In designating sea grass habitat as an HAPC, fishery managers noted that they are of ecological importance and are sensitive to human-induced environmental degradation.

The Project Would Have Significant Impacts on Pacific Herring and Its Predators

The Initial Study states that the project would have a less than significant impact on spawning Pacific herring. The Initial Study also notes that "[s]pawning 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" and that Coast will "notify the California Department of Fish and Wildlife's Eureka Marine Region within 24 hours" when herring spawning is observed on aquaculture beds."

Since the 1970's, Department staff and Humboldt Bay herring fleet leaders have undertaken collaborative research to describe the phenology, stock profile, and geospatial distribution of spawning herring in Humboldt Bay.[22] In the 12 seasons between 1974 and 2015 when research has been conducted, areas where herring persistently spawn has been mapped. These maps clearly show the virtually complete overlap of the proposed expansion areas with spawning habitat (areas outlined in orange, Figure 2). These areas are used by herring between 17%-100% of the time, and collectively are the key areas for herring in Humboldt Bay. Within spawning habitat, numerous factors, such as environmental variables and fish abundance, influence the locations where spawning occurs in a given year, and this spatial diversity of spawning locations promotes population resiliency and may enable the population to spawn in years with varying environmental conditions: "The locations that support large and repetitive spawnings deserve the most attention and consideration from possible environmental impacts."[23]

As noted above, the project would have significant unavoidable impacts on eelgrass, a preferred spawning substrate for Pacific herring. While herring will to some extent spawn on hard natural and artificial substrates, such as unsilted gravel and pilings,[24,25,26,27] artificial surfaces do not provide the same quality spawning habitat as eelgrass. Indeed, a study in Puget Sound found that "[t]he local disappearance of some eelgrass meadows has led to the cessation of herring spawning activity in particular areas."[28]

The project is also likely to disturb holding and spawning herring through routine maintenance operations. The Washington Department of Fish and Wildlife notes that "[c]onservation of herring spawning habitat, and *minimizing disturbance in the prespawning holding areas* (emphasis added) is key to the preservation of the herring stocks inside Puget Sound."[29] The same principles apply in Humboldt Bay.

The project's likely significant adverse impacts on herring are all the more serious in light of the reduced abundance of Pacific herring stock abundances on the West Coast, [30] including in Humboldt Bay. From 1974 to 2007, herring biomass estimates for Humboldt Bay averaged just under 400 tons. Herring returns weakened dramatically between 2000 and 2007—the last year spawning biomass was assessed in Humboldt Bay—when biomass had fallen to 7 tons.[31] According to preliminary analyses from the Farallon Institute for Advanced Ecosystem Research, there has been a statistically significant negative linear trend in herring spawning biomass in Humboldt Bay from 1974-2007.[32]

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

The Importance of Humboldt Bay Herring to Salmonids and Other Marine Wildlife

Humboldt Bay supports the third largest herring spawning aggregation in California and the largest aggregation between Puget Sound, WA and Tomales Bay, CA. A growing body of literature points to Pacific herring as a key prey item for marine predators, including commercially and recreationally important species, such as salmonids, and dozens of other taxa of marine predators, including seabirds, whales, and pinnipeds.

A. Salmonids

Herring is one of the most important prey items of Chinook salmon in central California, along with anchovies, sardines, and jack mackerel.[33] Chinook salmon feed preferentially on herring in offshore areas.[34] Reductions in prey availability have played a role in recent declines in Chinook salmon abundance. Over the last half century, there has been a dramatic decline of herring in Chinook salmon diet in central California. In 1955, herring comprised the majority of Chinook salmon diet in the late winter and spring (February, March, and April) with significant pulses also in summer. In 1980-1986, herring comprised a minority of Chinook salmon diet in late winter/spring, although summer pulses were still evident at similar levels. The winter/spring season was not sampled in 2005-2007, but herring were undetectable during the summer period when herring had previously comprised 10% of salmon diet.[35] At the same time, stocks of anchovies in southern California, and stocks of sardines coast-wide, have declined.[36] This overall reduction in prey availability and diversity has "likely contributed to reduced and more variable Chinook salmon abundance and return rates."[37]

Adverse impacts to salmon are particularly significant in light of their imperiled status. Chinook salmon, coho salmon, and steelhead are protected under both the California and federal endangered species acts. In addition to relying on the herring spawned in Humboldt Bay as a critical food source, these species rely on Humboldt Bay itself as part of their habitat. In fact, Humboldt Bay is included in designated critical habitat for Chinook salmon, coho salmon, and steelhead under the federal ESA.

B. The importance of herring to other marine wildlife

Due to the foundational importance of herring as prey for salmon and wildlife, a primary goal of the DFW's herring commercial fishery program is to "safeguard herring as an important forage species for all living resources of marine and estuarine ecosystems that utilize herring as a food source."[38] Recent analyses of predator diets in the California Current System (British Columbia through Baja California) highlight the importance of herring to predators. For 32 predators evaluated in this region, Pacific herring ranks as the fourth most significant prey species out of a total of 27 prey species. [39]

Herring and their roe provide a persistent, energy-rich, and aggregated food source for a wide suite of bird species. Herring aggregate to spawn in the late winter and spring, and their eggs are highly available, energetically rich, and high in lipids. Spawning locations are localized and herring eggs are abundantly available for several weeks. Herring roe are eaten by dozens of bird species, including brant, American wigeon, lesser and greater scaup, harlequin duck, surf scoter,

greater white-fronted goose, common goldeneye, black scoter, white-winged scoter, redhead, canvasback, bufflehead, ring-billed gull, glaucous-winged gull, Bonaparte's gull, western gull, and mew gull.[40] Adult herring are consumed by numerous marine birds including Brandt's and double-crested cormorants, brown pelicans, western grebes, terns, gulls, shearwaters, cormorants, common murre, auklets, tufted puffins, marbled murrelet, and brown pelican.[41,42]

Pacific sea ducks are more dependent on herring than other avian taxa. Harlequin ducks aggregate in British Columbia when feeding on herring roe,[43] and long-tailed ducks [44]seek out and preferentially feed on herring roe. Scoters in particular are highly dependent on herring roe for overwinter survival and breeding success. Scoters alter their movement and habitat use patterns in spring to take advantage of ephemeral and energy-rich herring roe, suggesting that this food resource is of particular importance to these species.[45,46] The Pacific population of surf scoters have declined by 50-60% in the last 50 years,[47] while greater and lesser scaup, two other diving ducks that depend on herring roe, have declined by 15%.[48] In British Columbia, waterbirds aggregate at increasingly fewer spawning sites.[49] Wintering piscivourous marine birds in Puget Sound have declined over decadal scales, likely reflecting a decline in herring, sand lance and smelt.[50] These decreases in herring spawning aggregations throughout the birds' ranges make the remaining spawning sites, like in Humboldt Bay, all the more significant and in need of protection.

The Project Is Likely to Have Significant Impacts on Brant, Other Waterfowl, and Shorebirds

Humboldt Bay has been designated by the National Audubon Society and BirdLife International as a global and national Important Bird Area due to its importance to brant, other waterfowl, and shorebirds. Removing or degrading eelgrass would impact many bird species that prey on fauna associated with eelgrass beds. Shorebird species that forage in Humboldt Bay eelgrass beds include black-bellied plover, semipalmated plover, marbled godwit, black turnstone, long-billed curlew, dunlin, whimbrel, willet, long-billed and short-billed dowitchers, sanderling, and lesser and greater yellowleg. Waterfowl, including pintail, mallard, and green-winged and cinnamon teal feed on eelgrass seeds and infaunal bivalves.[51]

Humboldt Bay is believed to be the most important spring staging area for brant in California, and one of the most important in the entire Pacific Flyway. An estimated 80,000 birds use the bay each year, representing more than 60% of the total brant Pacific population. Humboldt Bay's eelgrass beds provide overwintering brant with the bulk of their diet. Both the quantity and quality of Humboldt Bay's eelgrass are important for brant breeding success.[52] Brant do not use upland habitat for foraging. Human activities which have the greatest potential for physically degrading migration and wintering habitats include aquaculture.[53]

The Pacific population of brant has only recently increased above the continental management objective of 150,000 birds. [54]A specialization on eelgrass makes the brant particularly vulnerable to forced changes in their environment.[55] Availability and abundance of eelgrass is a major factor affecting distribution and abundance of brant during winter[56] and spring staging.[57, 58]

The Initial Study speculates 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)," but that brant may "gradually adapt to the presence of aquaculture." There is no evidence that brant would adapt to this type of disturbance. Brant's response to stimuli ranges from brief alert behaviors to immediate departure from a site. Excessive disturbances that interrupt foraging time are a concern because they can prevent birds from obtaining necessary resources for migration and egg-laying and thus lower reproductive performance.[59]

The Initial Study acknowledges that "brant may be required to expend additional energy to relocate to areas without aquaculture structure." Alternatively, if they have no other options, the Study claims that "it is likely that brant would forage in the Project footprint, even if wary of the infrastructure or occasionally flushed by culturists." Published studies show that brant change their seasonal use patterns due to disturbance. In Washington, oyster farming activities were correlated with reductions in eelgrass abundance and in turn, significant decreases in brant use-days.[60] Therefore, the Study's assertion that disturbance to brant would not significantly affect them is contradicted by scientific findings.

Moreover, the Initial Study's suggestion that "[a]lthough 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" is not supported. In reality, according to the Pacific Brant Management Plan, conservation measures currently do not adequately protect primary brant staging and wintering areas.[61] The proposed expansion would only further undermine the guidelines of the Pacific Brant Management Plan.

Reducing winter food availability would decrease the ability of adults to breed and has the potential to decrease the size of the brant Pacific population. The dependence of brant on eelgrass and other intertidal habitats leaves them vulnerable to the human activities that increasingly impact shallow bays and estuaries along North America's coast, including the large-scale expansion of mariculture. [62],[63]

The Project May Adversely Affect Threatened and Endangered Species

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

impacts must be fully analyzed in an EIR and through CESA and ESA consultation with the DFW, NMFS, and FWS.

The Initial Study's Findings Are Inconsistent with CEQA Standards and Past CEQA Determinations Regarding the Impacts of Coast Seafoods' Operations in Humboldt Bay

The Initial Study's assertions that the project will have less than significant impacts on the environment are undermined by the history of Coast Seafoods' operations and CEQA review. In 2007, the Harbor District reviewed Coast Seafoods existing operations and determined that scaling back Coast Seafoods' then *existing* operational footprint from 500 acres to 300 acres was a primary mitigation measure necessary to offset the overall project's adverse effects and obtain a Mitigated Negative Declaration.[64] The Initial Study offers no explanation of how the current proposed expansion of operations into – and beyond – areas that were required to be set aside for mitigation just a few years ago can now be considered a less than significant impact.

The Initial Study also fails to acknowledge that Coast's current proposal to more than triple its own footprint in the North Bay is concurrent with the Harbor District's proposal to expand mariculture in the same part of Humboldt Bay by an additional 550 acres. Each of these projects alone would have significant impacts on Humboldt Bay and the many species that depend on it. Together, these projects would nearly quadruple the portion of Humboldt Bay being converted from natural habitat to mariculture. When viewed in the context of the Harbor District proposal and existing operations, the impacts of Coast Seafoods' proposal are unquestionably "cumulatively considerable" under CEQA. Cal.Code Regs., tit. 14, § 15064(h).

The fact that the current proposed expansion includes areas previously required to be set aside for mitigation furthers demonstrates that this project may not be permitted without the completion of a full EIR and the implementation of measures to avoid and minimize environmental harm. CEQA Guidelines allow a lead agency to "determine that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program . . . that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located." Cal. Code Regs., tit. 14, § 15064(h)(3). In this case, Coast Seafoods' proposed expansion directly violates previous mitigation requirements.

Such a large-scale alteration of the environment may not be permitted without thorough and transparent CEQA review in an EIR. That EIR must fully analyze the cumulative impacts of this project when added to existing and proposed mariculture operations and must present alternatives and mitigation measures to prevent and minimize environmental damage. The 2007 Mitigated Negative Declaration for Coast Seafoods' operations demonstrated that such alternatives and mitigation measures include substantially reducing the extent of operations.

Conclusion

In sum, we believe it is clear—based on available scientific and other information—the proposed project will have very significant adverse impacts on Humboldt Bay and California's environment as a whole. We therefore request that the Harbor District deny Coast Seafoods'

request for a Mitigated Negative Declaration and require the completion of a full EIR for the project. We further request that the Harbor District review this project together with other proposed aquaculture projects so as to understand and base decisions on the true extent of their cumulative impacts. In this larger context, we urge the Harbor District to require any proposed expansion of aquaculture operations to entirely avoid impacts to eelgrass habitat, other sensitive habitat areas, and key forage species including herring.

Thank you for your time and consideration.

Sincerely,

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Audubon California

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Earthjustice

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

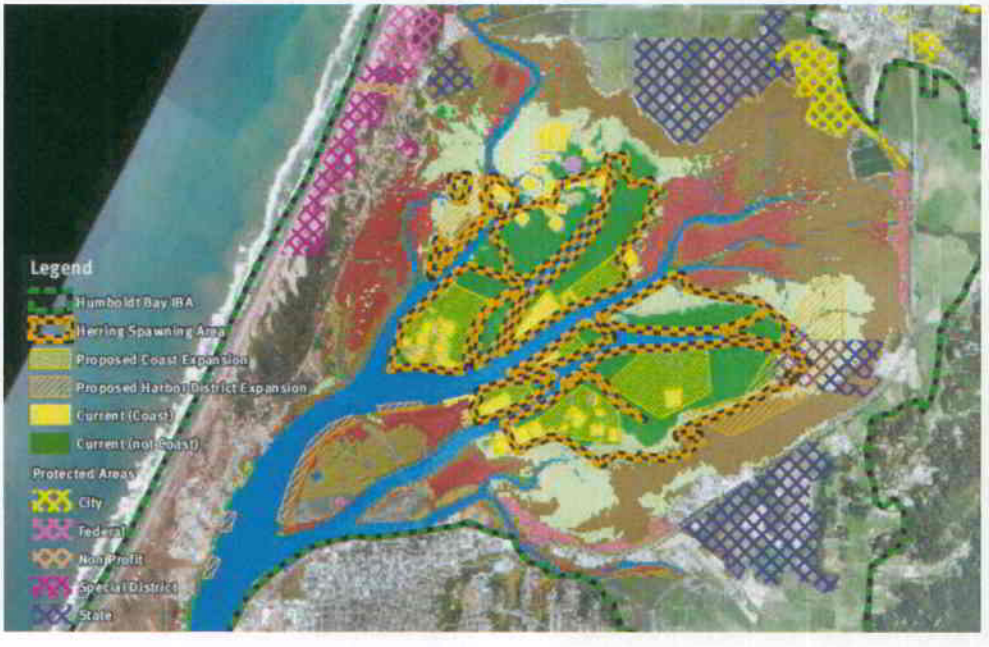

Figure 2. Current Coast Seafoods operation (yellow solid area, see Key); Proposed Coast Seafoods Expansion Area (yellow hatched area, see Key); and areas of persistent herring spawn (outlines in orange and black, see Key). Source: James Ray, Environmental Scientist, DFW, Eureka, CA.

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February 26, 2015

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

Re: Comments on the Coast Seafoods Company's Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project, Draft Initial Study

Dear Mr. Crider,

On behalf of the members, board, and staff of Humboldt Baykeeper, Northcoast Environmental Center, and Ecological Rights Foundation, we respectfully submit these comments on the Draft Initial Study for the Coast Seafoods Permit Renewal and Expansion Project, released on January 20, 2015.

Humboldt Baykeeper works to safeguard our coastal resources for the health, enjoyment, and economic strength of the Humboldt Bay community. The Northcoast Environmental Center works to promote understanding of the relations between people and the biosphere and to conserve, protect, and celebrate terrestrial, aquatic, and marine ecosystems of northern California and southern Oregon. Ecological Rights Foundation is devoted to furthering the rights of all people to a clean, healthful, and biologically diverse environment.

The Coast Seafoods Permit Renewal and Expansion Project proposes an expansion from 296 acres currently under production to 910 acres. The vast majority of areas proposed for expansion (599 acres) are sited in eelgrass beds, with most (531.2 acres) proposed in dense eelgrass (<85% cover). Although the proposed culture methods are certainly less harmful to eelgrass and other resources than the bottom culture that was abandoned in 2001, long-line methods have the potential to impact the environment in a variety of ways. The Draft Initial Study needs to be followed by a more thorough assessment of potential impacts, avoidance strategies, mitigation measures, cumulative effects, and alternatives analysis. Our specific concerns are discussed below.

Eelgrass and its Habitat: Shellfish culture is done on tidelands which are held by the State of California in trust for the public benefit. Eelgrass (*Zostera marina*) is one of Humboldt Bay's public trust resources. It is a species of great biological and economic importance in that it supports Dungeness crab, juvenile salmon and

steelhead, Pacific herring, black brant, and numerous other wildlife species, some of which are important commercial fisheries. Because of its importance, state and federal agencies' "no net loss" policies exist to prevent eelgrass destruction, including compensatory mitigation when impacts cannot be avoided.

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

A number of studies have found that impacts to eelgrass vary with aquaculture methods, although no methods have been found to avoid impacts to eelgrass density and biomass entirely.[1] There is insufficient data in the Draft Initial Study to determine whether current operations are having a negative impact on the eelgrass and related species.

Coast Seafoods' 2007 Initial Study states, "the District finds that the reduction in operational footprint from 500 acres to 300 acres is a primary mitigation measure for the potential adverse impacts to biological resources that were identified in the 1998 MND." It is unclear how the proposed expansion will be consistent with this 2007 mitigation measure, since the baseline for CEQA analysis is based on current conditions.

For any proposed expansion, avoidance and minimization measures should be analyzed, and where impacts cannot be avoided, appropriate mitigation measures should be proposed. The Draft Initial Study proposes to develop a monitoring and adaptive management plan (Mitigation Measure Bio-2), which is appropriate in combination with avoidance and mitigation measures. Relying upon monitoring and adaptive management as the primary method of mitigating impacts to eelgrass would constitute deferred mitigation as described in 14 CCR §15126.4 (a) (1)(B).

Pacific Herring Spawning Areas: Key herring spawning areas should be avoided in the proposed project to protect this important resource upon which so many other species depend, including commercial fishermen. In particular, the area identified as the East Bay Management Area in Coast Seafoods' 2006 Coastal Development Permit (CDP-Th5a-5-2006) should be completely avoided, in accordance with Special Condition No. 2, which includes "A prohibition on future plantings in an area called the East Bay Management Area. **Special Condition No. 2** would require that no

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

future plantings be sited in any known or historic eelgrass habitat within Coast's East Bay Management Area." (see map, attached). Avoiding expansion into key Pacific herring spawning beds will also avoid some of the proposed project's impacts to eelgrass.

Wintering and Migrating Shorebirds: As noted in the Draft Initial Study, aquaculture practices have the potential to reduce the amount of foraging habitat for shorebirds through habitat degradation and human disturbance. The shift in species diversity summarized in the Draft Initial Study fails to contemplate mitigation strategies for species that are likely to be negatively impacted. Potentially positive impacts to other species should not be regarded as mitigation for negative impacts to different species of shorebirds.

Black Brant: The assessment of impacts to black brant, which feed almost exclusively on eelgrass, is speculative at best. To simply expect brants to either get used to the increase human activity, learn to forage under longlines, move to South Humboldt Bay, or find something else to eat does not justify the conclusion that significant impacts will likely not occur. The Draft Initial Study states that there may be cumulative effects to brant, but appears to rely on the Pacific Flyway Council's population level monitoring and adaptive management of hunting pressure as mitigation for the project's impacts.

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

Marine Mammals: Seal haulout areas should be identified and avoided, with consideration of both direct and indirect impacts from increased presence of workers and boats used to access shellfish areas. Educating workers on avoidance as discussed in Bio-D3 is a good strategy in general, but identifying and avoiding seal haulouts in siting shellfish production areas should be considered the most effective avoidance strategy.

Benthic Organisms: Please address potential impacts to benthic organisms from increased disturbance caused by workers walking on mud flats.

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

Aesthetics: Visual impacts in scenic coastal areas should be more thoroughly assessed to include reflections from shellfish equipment like clam rafts. Special attention should be given to areas designated as Coastal Scenic and Coastal View

Areas in the Humboldt Bay Area Local Coastal Plan with regard to avoiding or minimizing aesthetic impacts.

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

Cumulative Effects: Cumulative effects should be analyzed to consider all potential impacts of the proposed project as well as the Harbor District's Mariculture Expansion Pre-Permitting Project and any other reasonably foreseeable future shellfish projects.

Alternatives Analysis: Since the proposed project is likely to meet the threshold of Findings of Mandatory Significance, it will behoove the project proponent to prepare an Environmental Impact Report and to conduct an alternatives analysis. Specifically, the use of higher elevation sites where eelgrass is absent or sparse should be analyzed. An alternative with a much smaller footprint should also be analyzed. We believe that the proposed three-fold expansion is too large given the sensitive habitat and the concurrent proposal for shellfish expansion of similar size.

We believe that the shellfish industry can be compatible with the conservation and recreation functions of the District. Whether shellfish can be sustainably produced in a larger area of Humboldt Bay will depend in large part on whether—and where—they can be grown with minimal impacts to eelgrass and other species that depend on a healthy bay ecosystem.

We appreciate the opportunity to comment on the scope of the environmental impacts assessment and alternatives analysis, and hope that your project team finds these comments helpful.

Sincerely,

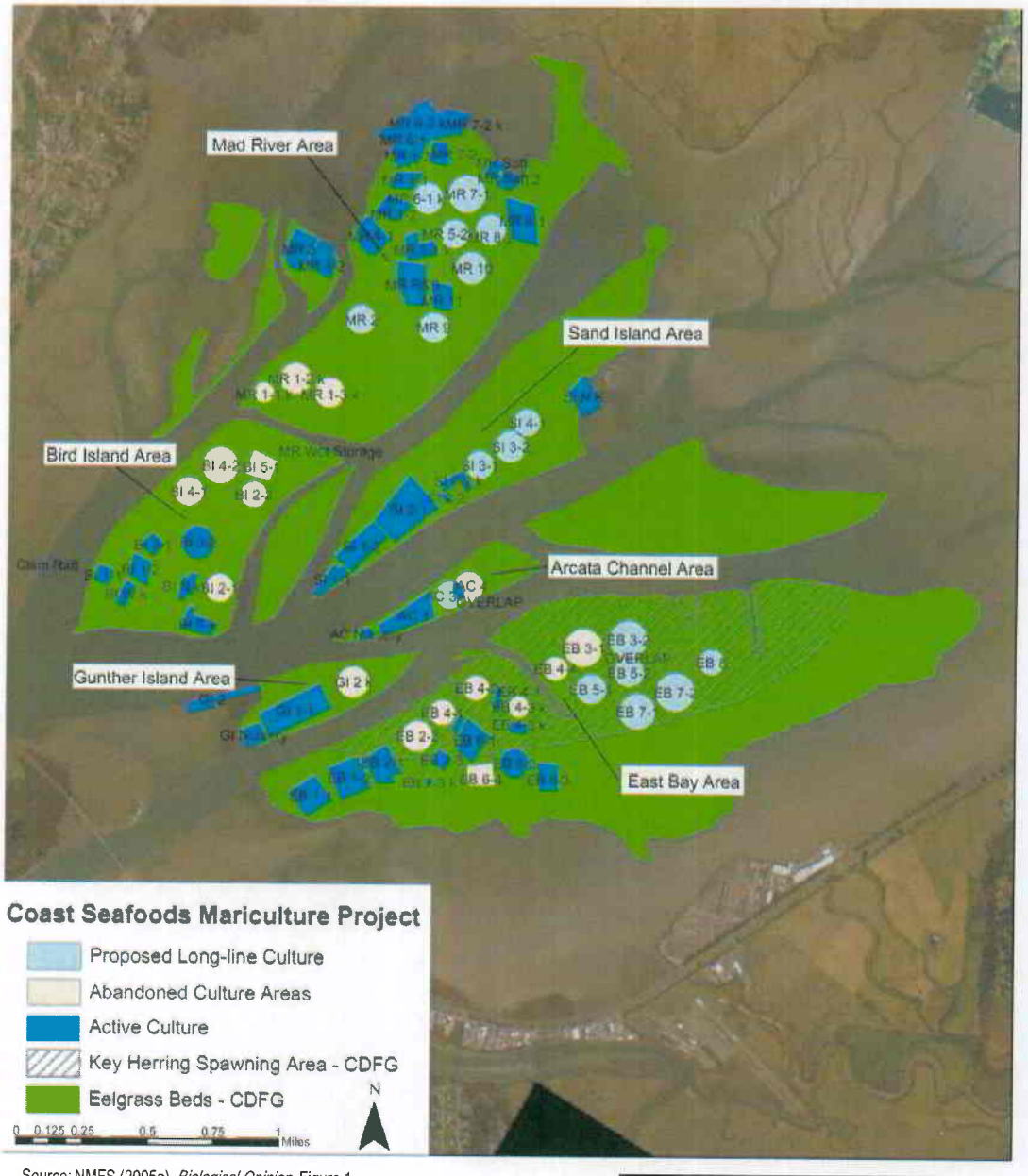
__s/_____
Jennifer Kalt, Director
Humboldt Baykeeper

__s/_____
Dan Ehresman, Executive Director
Northcoast Environmental Center

__s/_____
Fred Evenson
Ecological Rights Foundation

Attachment:

Exhibit 11, E-06-003: Coast Seafoods Mariculture Project Key Herring Spawning Areas, CDP-Th5a-5-2006.



Source: NMFS (2005a), *Biological Opinion*, Figure 1

Exhibit 11
E-06-003: Coast Seafoods
Key Herring Spawn Area

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

FEB 27 2015

In response refer to:
WCR-2015-00055

Mr. George Williamson
District Planner
Humboldt Bay Harbor, Recreation, and Conservation District
P.O. Box 1030
Eureka, California 95501

Dear Mr. Williamson:

This letter constitutes NOAA's National Marine Fisheries Service (NMFS) response to the Humboldt Bay Harbor, Recreation, and Conservation District (HBHRCD) January 23, 2015, electronic mail request. The HBHRCD requested input regarding the potential environmental effects, as well as the level of significance of those effects pursuant to California Environmental Quality Act (CEQA), of the proposed Coast Seafoods Company (Coast), Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project (Project). Coast is proposing to continue operations on 296 acres of Humboldt Bay and expand shellfish aquaculture operations into 622 intertidal acres. The HBHRCD provided the following three documents which describe the Project and its environmental effects: January 20, 2015, Draft Initial Study for the Project (DIS); December 15, 2014, Coast Seafoods Shellfish Aquaculture and Eelgrass Ecological Review for Humboldt Bay (EER); and the December, 2014, Humboldt Bay Carrying Capacity Analysis (CCA).

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

NOAA's aquaculture goals and objectives as outlined in both the Department of Commerce and NOAA's National Marine Aquaculture policies issued in June 2011, encourage and foster development of sustainable marine aquaculture in the context of NOAA's multiple stewardship missions, and social and economic goals. Also in June 2011, NOAA issued a National Shellfish Initiative to further the goal of increasing populations of bivalve shellfish in our nation's coastal waters through sustainable commercial production and native shellfish restoration activities. NOAA recognizes the broad suite of economic, social, and environmental benefits provided by shellfish, including jobs and business opportunities; meeting the growing demand for seafood; habitat for important commercial, recreational, and endangered and threatened species; species recovery; cleaner water and nutrient removal; and shoreline protection. Within NOAA's National Ocean Service (NOS), the Coastal Aquaculture Planning and Environmental Sustainability (CAPES) program works to support coastal planning for marine aquaculture including operating, monitoring, and assessing aquaculture impacts in coastal environments.

This letter represents input from the CCO, the California Regional Aquaculture Coordinator, and NOS-CAPES. In the Regulatory Authorities section, NMFS provides information on biological resources, *i.e.*, species and habitats, under our stewardship that may be affected by the Project. NMFS comments and recommendations are organized into two sections: Project Description, and Potential Environmental Effects to Biological Resources. Key comments and recommendations pertain to: 1) information needed to better understand the Project location and operations; 2) corrections needed to correctly characterize CEMP recommendations; 3) conclusions regarding effects to eelgrass from proposed spacing of cultch-on-longline oyster culture; 4) conclusions regarding the ecosystem functions of oyster culture and how they relate to eelgrass; and, 5) conclusions pertaining to potential shellfish aquaculture effects to the phytoplankton availability to the food web.

NMFS REGULATORY AUTHORITIES

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

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

additional source of information on the status of the Humboldt Bay Tributaries population, and its role in recovery of this ESU.

For CC Chinook salmon and NC steelhead, the essential primary constituent elements (PCE) of critical habitat support rearing and migratory corridor functions, are namely areas free of obstruction with water quality, water quantity and salinity conditions supporting juvenile and adult physiological transitions between fresh-and saltwater; and aquatic vegetation which supports juvenile and adult foraging, including aquatic invertebrates and fishes, supporting growth and maturation. The PCEs in the action area support a timely ocean entry of juvenile CC Chinook salmon and NC steelhead, through the rearing and migratory corridor functions.

The estuarine PCEs of southern DPS green sturgeon critical habitat in Humboldt Bay that are essential to the conservation of this species include: food resources; water flow; water quality; water depth; sediment quality; and migratory corridors to support feeding, migration, and aggregation and holding by green sturgeon adults and subadults. The invertebrate prey resources for green sturgeon in Arcata Bay are primarily found in the intertidal mudflats and subtidal channel margins, and include epibenthic and benthic invertebrates, Dungeness crab, and a variety of clams. Ghost shrimp are the preferred prey item for green sturgeon in Washington estuaries, comprising up to 50 percent of their diet (Dumbauld *et al.* 2008). The deep water channels in Humboldt Bay serve as a migratory corridor connecting the rearing and holding habitat in Arcata Bay with the Pacific Ocean.

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

Marine Mammal Protection Act. Under the MMPA, NMFS is charged with protecting whales, dolphins, porpoises, seals, and sea lions. Under section 118 of the MMPA, NMFS is required to categorize all U.S. Commercial Fisheries into one of three categories based on the level of incidental serious injury and mortality of marine mammals occurring in each fishery, and publish a List of Fisheries (LOF) each year. Shellfish aquaculture is considered a Category III fishery, and operators are not required to register with NMFS or obtain a marine mammal authorization (79 FR 14418, March 14, 2014). However, any operator participating in a fishery

listed on the LOF must report to NMFS all incidental injuries and mortalities of marine mammals that occur during commercial fishing operations, regardless of the category.

PROJECT DESCRIPTION

In order to grow shellfish for harvest, Coast's commercial aquaculture operations involve the placement of shellfish on or in structures within the water column and on the substrate of Humboldt Bay. The description of the shellfish infrastructure and its location, as well as the operations associated with infrastructure maintenance and shellfish harvest, establishes the spatial and temporal framework for the analysis of potential effects to the physical and biological components of the aquatic habitat.

Provide the Number and Location of Existing Shellfish Operations in Humboldt Bay. In order to further understand the aquatic footprint of Coast Seafoods existing intertidal cultch-on longline culture, NMFS recommends including information from Coast Seafoods bed status tables (Dale 2013) and Cziesla (2005) to help explain the existing operations, *e.g.*, actual line spacing in different regions of Arcata Bay (Mad River, East Bay, Sand Island, Arcata Channel, Gunther Island). NMFS also recommends clarifying whether the existing spacing of five longlines spaced 2.5.ft apart with a parallel spacing of five feet between groups of five lines and 10 ft spacing perpendicular to groups of five line illustrated in DIS Figure 6, comports with existing operations.

Because the dimensions of all the inwater clam raft structures are important to describe the surface and water column footprint (DIS, 3.1.7), the dimensions of the work platform should also be included. In addition the project description should, clarify whether each array of 10 rafts has a work platform or if single work platform serves all 30 rafts. Currently, two arrays of clam rafts without any identified work platform are permitted under a Corps NWP 48 (NMFS 2012b); however, all 30 clam rafts arrays, along with associated work platform(s) will part of the proposed Project.

Identify the number and type of culture units in Coasts existing operations. For example, one unit of cultch-on-longline is comprised of five lines and associated information (*e.g*, line length, spacing, number and dimension of stakes. The unit footprint (surface area, water column volume, area shaded, and benthic area) of each culture type in the existing shellfish operations should also be clearly presented, perhaps in table format.

Provide the Number, Stocking Density, and Location of Proposed New Shellfish Infrastructure in Humboldt Bay. NMFS recommends a clear presentation of the maximum area to be planted at each location in Arcata Bay, as well as a description the benthic footprint of the structures, water column volume occupied by the structures, and stocking rate (number of animals) that may be planted per acre in each region of Arcata Bay. In addition, the likely type of aquaculture method (*i.e.*, number of longlines for cultch and basket) should be provided for each area. Because the 2013 bed status table (Dale 2013) shows variability in the number of longlines planted per acre in Coast's existing operations, the number of longlines per acre in the proposed intertidal expansion areas is an important spatial consideration for both the carrying capacity analysis, and for determining the potential effects of the new shellfish infrastructure on

eelgrass at an acre scale. In addition, since each type of aquaculture structure has a unique footprint, this information will aid in the determination of the potential effects to benthic and water column habitat of the maximum utilization of the intertidal expansion area.

The location of new infrastructure relative to eelgrass beds is germane to an effects analysis. For this reason, please clarify whether rack and bag within 100 acres of the new intertidal expanded areas will unequivocally avoid eelgrass habitat (including any unvegetated buffer), or if placement will be outside of eelgrass to the extent practicable. In order to more accurately analyze the potential effects of the footprint of this culture type on vegetated and unvegetated benthic habitat, identify the maximum number of rack and bag structures likely to be installed.

Provide a more detailed description and maps of where the new beds are likely to be placed, using Coast's information on the location of previous bottom culture in the various regions of Arcata Bay. If the proposed Project longline expansion will be located in former ground culture beds, a map showing the location of those beds would be helpful to illustrate the spatial relationship of the existing and proposed beds. Eelgrass habitat function (as measured by CEMP metrics) on former, hardened ground culture beds, where the thickness of layer of shell in the sediment varies from several inches to a foot or more (Cziesla 2005), may be different than areas within Coast's lease that have never been planted. Increased specificity of locations for planting may be useful when describing potential effects to eelgrass at a site specific location. Additional information on hardened culture beds where operations previously took place (*i.e.*, how long these beds have been fallow) is also useful.

In order to understand the spatial relationship of the Project's intertidal aquaculture structures, an additional map showing proposed new culture overlain on existing culture would be helpful. In addition, NMFS recommends an additional map, similar to Figure 1 in NMFS (2005) showing the location of the Pacific herring spawning areas relative to both the existing and proposed intertidal operations.

NMFS recommends that a figure, similar to Figure 6, be included to clearly illustrate that the proposed spacing regime between groups of four lines will be increased from the current 5 ft space between groups of five longlines (Figure 6) to 10 ft.

Clarify Existing and Proposed Coast Shellfish Biomass Planted in Humboldt Bay (CCA, Table 2). Clarify whether the enumerated 33.18 metric tons for the Coast Project refers to the biomass of Coast's existing and proposed operations, or only to the biomass on the 622 acre expansion.

Clarify BMP-6, Marine Mammal Education (DIS 3.4, 21;Harbor seal, p. 32). In their 2003 permit application to the Corps, Coast proposed to submit Harbor Seal Avoidance Protocols to the Corps, to include a qualified biologist who would identify all harbor seal haul-out or pupping locations in the vicinity of Coast Seafoods operations, and develop the protocols (NMFS 2005). Similarly, the DIS should identify the source of marine mammal protocols, and harbor seal pupping and haul-out locations. Lowry *et al.* (2005) documented the location and number of harbor observed in Arcata Bay in July, 2004, and would be a recommended reference to inform this description. The HBHRCD should contact Monica DeAngelis of NMFS (monica.deangelis@noaa.gov) for any additional seasonal recommendations to minimize disturbance of harbor seal females and pups.

POTENTIAL ENVIRONMENTAL EFFECTS TO BIOLOGICAL RESOURCES

NMFS provides the following comments regarding the potential effects of the Project on biological resources under our stewardship. In addition, NOS-CAPES is providing technical review and comment on the CCA and EER. The CCA review and comments are enclosed, and the EER review may be provided in the near future. NMFS reminds the HBHRCD that the effects of both existing operations and the proposed intertidal aquaculture expansion should be described.

Characterization of Existing Eelgrass Habitat. Potential effects to eelgrass should be evaluated, regardless of its classification. Currently, an eelgrass bed in Humboldt Bay is classified as either continuous or patchy, which is a naming convention of the Coastal and Marine Ecological Classification System (CMECS) used for mapping the habitats in Humboldt Bay. Under CMECS, eelgrass bed classification is a function of both continuity and percent cover, *i.e.*, patchy eelgrass cover ranges from >10% and <85% whereas continuous eelgrass is ≥85 percent cover.

Gilkerson (2008) model results show 22 percent of predicted eelgrass habitat lacks eelgrass; however, the EER concludes that eelgrass in Humboldt Bay is "likely approaching its carrying capacity." Based on the model showing that 22 percent of predicted habitat lacks eelgrass, the conclusion that eelgrass is at carrying capacity is not fully explained. NMFS recommends that the conclusion be revised accordingly or provide additional information that explains this conclusion. In addition to the potential factors limiting Humboldt Bay eelgrass identified in the EER, please include a description of the effects of aquaculture, disease, and non-native Japanese eelgrass on eelgrass.

NMFS also recommends the EER clarify whether the 17 percent inter-annual variability for percent cover of eelgrass is based on summer data or year-round SeagrassNet transect data. Because the current EER does not explain other factors that could account for the variability (*e.g.*, substrate characteristics, proximity to intertidal aquaculture, frequency of storms), NMFS suggests the potential analysis of effects to eelgrass include a discussion of such factors. Because the relationship of inter-annual variability of percent cover to potential inter-annual variability of the spatial extent of an eelgrass bed and the density of eelgrass within a bed is unknown, the EER should address how the SeagrassNet data will inform the eelgrass effects analysis.

Revise Characterization of CEMP. The CEMP in the EER should be characterized accurately.

- The CEMP states that if NMFS and authorizing agencies concur that the spacing of shellfish aquaculture does not result in a measurable net loss of eelgrass habitat in the project area, then mitigation associated with local losses under longlines may not be necessary (EER, p. 49, 56).
- Project activities that empirically demonstrate wholly neutral or beneficial impacts to eelgrass habitat should not be subject to compensatory mitigation.
- Increases in eelgrass may be considered to offset project impacts to eelgrass, only if the increase in eelgrass can be attributed to the project and the increase in eelgrass will not be temporary (EER, p. 49).

- CEMP does not "require" mitigation. The phrase (EER, p.49) should read "no additional mitigation would be recommended".

Clarify Conclusions regarding Effect of Proposed Spacing of Cultch-on-Longlines. NMFS (2011) biological opinion for aquaculture in the State of Washington, states that four longlines, spaced 2.5 ft apart, followed by an open space of 10 ft, would be considered for placement within eelgrass habitat. However, that biological opinion did not contemplate the amount of aquaculture (*e.g.*, 622 acres) proposed; and this spacing was considered to minimize, but not avoid, impacts to eelgrass. All statements in the DIS and EER that stated the aforementioned spacing was recommended by NMFS and avoided impacts to eelgrass should be corrected. The DIS (p.39) stated that studies in 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. In addition, the EER (p.47) states that the data presented by Rumrill and Poulton (2004) indicated a neutral effect (the same as the control) for 2.5 ft longline spacing. NMFS suggests careful interpretation of the study design; location and size of the experimental, reference, and control plots; and the results of the studies of longline spacing on eelgrass in Humboldt Bay (Rumrill and Poulton 2004), to insure that the results of the study are both correctly interpreted and applicable to the scale of the Project.

Provide Additional Information about Ecosystem Function and Value of Eelgrass and Shellfish Aquaculture. Additional functions provided by the living plant in *situ*, as well as in the ecosystem should be included, e.g., primary production, epiphytic production, detritus production, provision of wrack subsidies to the nearshore, floating cover when dislodged, protective water column cover within moving blades at high tide, protective substrate cover during low tide. Comparison of functions of bottom culture, oyster reefs and eelgrass in the EER are not appropriate for long-line culture. The supporting literature regarding ecological functions or benefits of shellfish aquaculture should be specific to the physical and biological characteristics of Humboldt Bay, and for the types of culture methods used (*e.g.*, cultch on long-line, basket-on-longline, and rack and bag culture). The following conclusions regarding ecological benefits regarding shellfish aquaculture are not completely explained. For example:

- Because Humboldt Bay is not a eutrophic system, removal of phytoplankton and associated benefits to water quality and clarity by shellfish aquaculture should not be counted as compensation for loss of eelgrass.
- The conclusion (EER, p.31) that the effects of shellfish culture improve water clarity conflict with the reasoning (EER p. 33) that effects of shellfish filtration on seston and phytoplankton is minimal.
- While artificial, rigid habitat structures may support similar species diversity as eelgrass, the species composition of invertebrate and fish species is likely different.
- The relevance of the transition zone or edge effect discussion for longlines is uncertain, given the proposed placement of longlines through dense, continuous eelgrass.

Determination of Net Loss Eelgrass Habitat Function. The EER proposes: a set threshold of reduction of eelgrass will serve as a trigger for adverse effects and subsequent compensatory mitigation; pre and post project eelgrass surveys to determine if the proposed longline culture overlapping with existing eelgrass results in a net loss of ecological function; and determination of impact to eelgrass will be made on a "net" basis across the entirety of Coast's expanded

footprint and not at any specific location. The ERR proposes that if monitoring can successfully identify ecological functions within aquaculture areas, and measure potential net changes in ecological function, then this information will be incorporated into the overall assessment of no net loss.

Consider the CEMP guidelines in order to establish an informed approach that employs true adaptive management to reduce uncertainty about impacts of proposed shellfish culture. The CEMP uses eelgrass areal distribution and density as proxies for eelgrass habitat function. The monitoring plan should consider and describe the difficulty in comparing ecological function between eelgrass and aquaculture structures; clearly identify the parameters that will be measured; and describe how the data will be interpreted..

Provide Further Support for Other Effects to Eelgrass. NMFS recommends the EER provide supporting documentation for the following:

- Modest displacement of eelgrass resulting in patchiness may be neutral or beneficial for some species.
- Proposed spacing of baskets-on-longlines, as well an analysis of whether the proposed spacing supports results in negligible impacts to eelgrass.
- Effects of basket-on-longline and rack and bag on eelgrass.
- Identify locations and estimate the area of potential impacts from boat operations and moorings.

Clarify Utility and Interpretation of Sustainability Indicators to describe Food Web Effects (CCA). Because zooplankton feed on phytoplankton, shellfish culture suspended in the water-column performs an ecological role similar to zooplankton (Gibbs 2007). NMFS suggests the use of Gibbs (2007) sustainability indicators would be strengthened if the CCA were to:

- Describe how the Gibbs (2007) method has been used elsewhere to date, as well as whether this approach has been demonstrated to be a credible, field-validated method, with some performance record.
- Describe why use of indicators for subtidal aquaculture is appropriate for intertidal aquaculture.
- Describe why only three of the four indicators were calculated, and why Gibbs (2007) depletion footprint was not calculated.

Clearance efficiency. Since the majority of Coast's current and proposed shellfish culture is located in intertidal habitat, consider expanding the carrying capacity analysis that evaluates a scenario using the daily tidal prism volume of Arcata Bay in determination of the clearance efficiency performance indicator. The tidal prism was the volume Czsiela (2005) considered when assessing the percentage of the volume of Arcata Bay water filtered per day by Coast Seafoods current operations. Because the oysters do not have opportunity to filter the entire volume of Arcata Bay in a day, the clearance efficiencies in the CCA may be inaccurate, and an underestimate. The basis for the three-day residence time (Bricker *et al.*2007) is unknown.

Filtration pressure. Gibbs(2007) suggests knowledge of biomass production on the farms can be used to estimate the total carbon extractred from the water column by shellfish culture every year. In the examples of filtration pressure performance indicator for Beatrix Bay, Gibbs (2007)

mentions that the bivalves require five times their biomass in carbon (assuming a 20% efficiency of conversion from phytoplankton to oyster tissue). As written, the filtration pressure in the CCA does not appear to consider this factor, and may be inaccurate. Consider including the conversion efficiency factor in the CCA.

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

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

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

Other Effects to Consider

Expand Spatial Scale of Effects Analysis. Since an individual animal encounters the intertidal habitat in their environment as a continuum at a scale commensurate with its body size and swimming ability, NMFS recommends that potential effects of existing and expanded intertidal aquaculture be evaluated at several spatial scales (*e.g.*, individual array of lines, acre, region of Arcata Bay, Humboldt Bay).

The scale of analysis for effects is important in Humboldt Bay since the eelgrass habitat may become fragmented when structures are placed within beds that alter the physical characteristic of the substrate and water column. At the scale of Arcata Bay or Humboldt Bay, the potential effects are localized at the scale of the spacing of individual (3, 4, or 5) longline arrays, acre, or individual shellfish beds which is the scale at which individual fish are likely to access the intertidal habitat during any given high tide cycle.(DIS, p. 39).

Expand Discussion of Effects to Physical Processes. Discuss the effects of the existing and proposed new shellfish culture structures on physical processes in the water and substrate, *e.g.*, water flow, turbulence, sediment transport, and accumulation of organic matter (Grant and Bacher 2001, Haven and Morales-Alamo 1966, Newfields 2009, Nightingale and Simenstad 2001). For example, juvenile salmonids are visual feeders; and decreased visibility or accessibility of prey during daylight hours can affect the likelihood of prey capture.

Provide Additional Information on Effects to Benthic Fauna. The DIS (p.37) did not include the the area under the pallets in the intertidal nursery areas in description of the Project benthic footprint, Since the intertidal nurseries account for 1.19 acres in the Arcata Channel area, and 3.62 acres in the vicinity of Gunther Island (Dale 2013), the existing benthic foot print (approximately 0.76 acres) in the DIS is likely an underestimate.

Expand Discussion of Effects of Intertidal Structures on Fish Behavior. Juvenile SONCC coho salmon (85 mm to 240 mm FL), CC Chinook salmon (70 mm to 172 mm FL), and NC steelhead have been collected in deep channel, tidal channel, and subtidal habitats of Humboldt Bay, including the Samoa Channel (Waldvogel 1977, Emmett *et al.* 1991, Cole 2004). Based on studies in estuaries in the Pacific Northwest (Hosack *et al.* 2006, Dumbauld *et al.* 2008), juvenile salmonids, as well as sub-adult and adult green sturgeon, likely forage in intertidal habitats in Arcata Bay. Juvenile salmonids feed on pelagic, epibenthic, and epiphytic organisms (Healy 1991, Sandercock 1991), including invertebrates and vertebrates (*e.g.*, zooplankton, amphipods, larval crustaceans, larval and juvenile fish). The invertebrate prey resources for green sturgeon in Arcata Bay are primarily found in the intertidal mudflats and subtidal channel margins. Epibenthic and benthic invertebrates prey include Dungeness crab, and a variety of clams. In Washington estuaries, ghost shrimp are the preferred prey item for green sturgeon in Washington estuaries, comprising up to 50 percent of their diet (Dumbauld *et al.* 2008).

NMFS recommends a thorough discussion of the potential effects of the placement of new in-water structures in intertidal habitat on unimpeded passage and rearing function of the designated critical habitat during flooding and ebbing tides. Present the potential effects of presence of both the existing and proposed structure on the bottom and in the water column, specifically the PVC stakes, associated lines and cultch/baskets, on the ability of green sturgeon subadults and adults to access the epibenthic and infaunal benthic prey in the intertidal areas within the Project footprint. The reasoning to suggest that entanglement is unlikely should be presented, as well as reconciled with the effects of potential future avoidance of an intertidal habitat area following introduction of aquaculture structure.

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

Expand Discussion of Potential Reduction in Prey Species. Pacific herring, an important prey species for listed salmonid juveniles and adults, are known to spawn on eelgrass in Arcata Bay (Mello and Ramsay 2004). Present a discussion of potential effects of aquaculture operations at the proposed intertidal sites that overlap with known Pacific herring spawning sites. Specifically, the survival of eggs attached to the infrastructure in known spawning beds compared to eggs deposited on eelgrass should be discussed. Although disturbance to spawning adults and newly spawned eggs may be reduced by avoiding these areas, include a discussion of the potential effects to survival of eggs spawned on the infrastructure compared to those spawned on eelgrass (e.g., increased desiccation due to exposure to air and wind, increased predation).

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

Sincerely,

Irma Lagomarsino
Assistant Regional Administrator
California Coastal Area Office

Enclosure

Literature Cited

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CAPES Program
National Ocean Service

CAPES Technical Review

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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The **Coastal Aquaculture Planning and Environmental Sustainability (CAPES)** program supports NOAA and NCCOS missions by delivering science-based decision support tools to local, state, and federal coastal managers. The CAPES program works to support coastal planning for marine aquaculture including operating, monitoring, and assessing aquaculture impacts in coastal environments.

Learn about CAPES and how we are growing sustainable marine aquaculture practices at: http://coastalscience.noaa.gov/research/scem/marine_aquaculture or contact Dr. James Morris at James.Morris@noaa.gov.

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February 27, 2015

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

Subject: Initial Study for the Coast Seafoods Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project

Dear Mr. Crider:

The California Department of Fish and Wildlife (Department) has reviewed the Initial Study (IS) that describes the potential impacts of the Coast Seafoods Lease Renewal and Expansion Project (Project). The Department has also reviewed the attachments to the IS: "Coast Seafoods Shellfish Aquaculture and Eelgrass Ecological Review for Humboldt Bay" (CSF 2014), and the "Humboldt Bay Carrying Capacity Analysis" (H.T. Harvey & Associates 2014). The Project proposes to continue Coast Seafoods Company's (CSF) existing operations on 296 acres, discontinue operations on 6.6 acres, and expand operations into an additional 622 acres of intertidal mudflat wetland habitats, mostly consisting of dense eelgrass. This Project would bring the operational footprint of CSF to a total of 911 acres.

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

The Department reviewed the IS and attachments provided by CSF and are concerned the Project will have potentially significant impacts to Public Trust resources, including eelgrass and mudflat habitats, and species such as Pacific herring, shorebirds and waterfowl including black brant. The IS identified potentially significant impacts and proposed mitigation measures to reduce impacts to less than significant. However, the Department does not find the proposed mitigation measures adequate for bringing the potential impacts to a level of less than significant. In addition, the assessment of cumulative impacts was not adequately addressed and impacts are likely to be cumulatively considerable. As was stated in the Department's letter to the lead agency dated July 11, 2014, the Department recommends that an Environmental Impact Report (EIR) be completed for this Project to thoroughly evaluate possible impacts and associated avoidance, minimization, and if necessary, mitigation measures.

Biological Significance

Humboldt Bay is California's second largest bay, and the largest estuary on the Pacific coast between San Francisco Bay and Oregon's Coos Bay. The marine and estuarine habitats of Humboldt Bay provide refuge and nursery habitat for more than 300 fish and invertebrate species, many with important commercial and recreational fisheries value. Numerous sensitive species, including some listed as threatened or endangered pursuant to CESA or the federal Endangered Species Act (ESA), and California species of special concern (SSC) occur in the Project area. The Department designates certain species as SSC due to declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction. Species that occur in the Project area and are protected under the CESA and ESA, or are SSC, include:

- Coho salmon, *Oncorhynchus kisutch*, State and federally-threatened (Southern Oregon/ Northern California Evolutionarily Significant Unit (ESU));
- Chinook salmon, *Oncorhynchus tshawytscha*, federally-threatened (California Coastal ESU);
- Coastal cutthroat trout, *Oncorhynchus clarki clarki*, State SSC;
- Steelhead, *Oncorhynchus mykiss*, federally-threatened (Northern California ESU);
- Eulachon, *Thaleichthys pacificus,* federally-threatened (southern distinct population segment (DPS));
- Green sturgeon, *Acipenser medirostris,* State SSC; federally-threatened (southern DPS);
- Longfin smelt, *Spirinchus thaleichthys*, State-threatened; and
- Black brant, *Branta bernicla nigricans*, State SSC.

Previous Mitigation

The Project proposes to expand into locations previously utilized for mitigation for CSF operations (HBHD 2007). The Department recommends avoiding areas that were part of previous mitigation measures, or to fully mitigate for impacts to biological resources for CSF's existing 300 acre operational footprint prior to any additional expansion of acreage.

Eelgrass

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

Impacts to Eelgrass. Eelgrass is considered Essential Fish Habitat under the federal Magnuson-Stevens Fishery Conservation and Management Act, as well as a Habitat Area of Particular Concern by the Pacific Fishery Management Council. The mudflat habitats that support eelgrass are also considered Special Aquatic Sites under the 404(b)(1) guidelines of the Federal Clean Water Act. Eelgrass and intertidal mudflat habitats are further protected under Federal and State "no-net-loss" policy for wetland habitats. In line with this policy, the Department recommends the proposed Project be revised to avoid impacts to eelgrass and mudflat habitats, and fully mitigate for any unavoidable impacts.

Significant impacts to eelgrass habitats from long line gear have been noted in Humboldt Bay. In 2009, an effort was completed to map the eelgrass resources of the Bay (Schlosser and Eicher 2012). This survey also noted the status of eelgrass in areas with aquaculture. In 2009, of the intertidal areas CSF utilized for aquaculture activities, 9% had dense eelgrass and 87% had patchy eelgrass. Utilizing data generated by Schlosser and Eicher (2012), and the habitat categorizations provided to the Department by CSF (Wagschal, per. comm., October 15, 2014 and January 26, 2015), it is estimated that of the areas utilized for aquaculture activities, 123 acres (47%) were categorized as having patchy eelgrass (<85% density) but were otherwise surrounded by areas of dense eelgrass. This lack of dense eelgrass in CSF's long-line aquaculture areas was also noted in the study by Rumrill and Poulton (2004). This study noted low percent cover of eelgrass (<15% cover) in areas commercially grown in lines spaced at 2.5 feet (ft.) (the current spacing utilized by CSF; CSF 2014), where nearby control areas had high percent cover (70 to 80%). Additionally, many of the aquaculture areas within the existing dense eelgrass area that CSF left fallow after 2005 have regrown into areas of dense eelgrass (Schlosser and Eicher 2012). Similar impacts from aquaculture gear and related activities would also be expected in expansion areas located in eelgrass.

Eelgrass Avoidance. The 1.5ft, 2.5ft., and 5 ft. spacing of long lines used in aquaculture operations have been shown to cause moderate to significant impacts to eelgrass

(Everett et al. 1995; Rumrill and Poulton 2004; Skinner et al. 2013; Skinner et al. 2014; Tallis et al. 2009). For example, of the long line spacing evaluated (1.5ft, 2.5ft., 5ft. and 10 ft.), by Rumrill and Poulton (2004) the 1.5 and 2.5 feet spacing showed a significant reduction in cover and density over time, as well as a reduction in plant length, width, and wet and dry weights. The 5 ft. spacing had 35 to45% coverage of eelgrass when compared to the reference stations, and the 10ft spacing was the most similar to the reference stations at 55 to 65% coverage. To avoid impacts to eelgrass habitats, the Department recommends the Project footprint incorporate a buffer between all eelgrass habitats and all new aquaculture apparatus. Consistent with the Department's recommendations to the Fish and Game Commission for aquaculture leases, we recommend that all eelgrass be avoided with a 10 ft. minimum buffer.

Black Brant

Black brant occur in Humboldt Bay as spring and fall migrant and winter visitors. Humboldt Bay is the fourth most utilized staging area in the Pacific Flyway for black brant, and has historically been the most important area in California for this species (Moore et al. 2004; Moore and Black 2006). Due in part to the health and size of eelgrass habitats found in the bay, Humboldt Bay provides the most important wintering and migration site in California for this species (Moffitt 1938; Pacific Flyway Council 2002). In spring 2001, it was estimated that Humboldt Bay held approximately 60% of the black brant population (Lee 2001). In addition to black brant, eelgrass has also been noted as the most important single food item to waterfowl that winter in Humboldt Bay (Yocum and Keller 1961). The reliance of Brant on eelgrass makes them highly vulnerable to fluctuations in the quality of this habitat (Moore et al. 2004; Pacific Flyway Council 2002; Ward et al. 2005; Wilson and Atkinson 1995). While habitat loss has been identified as a major threat to brant populations (Shuford and Gardali 2008), a variety of human activities, including aquaculture, have the potential for physically degrading eelgrass habitats (Pacific Flyway Council 2002; Wilson and Atkinson 1995). Aquaculture activities, including oyster operations, have specifically been noted to negatively affect eelgrass habitat and brant populations (Schmidt 1999; Shuford and Gardali 2008). Additionally, persistent human disturbance, such as occurs during aquaculture operations, could reduce the amount of time black brant utilize Humboldt Bay, and prevent populations from returning to historical levels (Moore and Black 2006).

The IS does not list the black brant as a Species of Special Concern in section Bio-A of the document. Additionally, while the document discusses potential impacts to black brant in section Bio-D4, it finds the impacts to be less than significant. The Department finds the proposed Project will impact approximately 24% of all habitats in north Bay between -0.5m and +0.5m (MLLW) (NOAA Coastal LiDAR data, 2012), as well as significantly impact eelgrass density and cover in Humboldt Bay. This large reduction in the sole food item black brant consumes would likely constitute a significant impact to the species. To reduce the impacts to black brant to less than significant, the Department recommends avoiding impacts to eelgrass habitats, minimizing habitat loss of mudflat habitats for roosting and resting, and minimizing impacts due to human disturbance.

Shorebirds

Humboldt Bay is an internationally important site for overwintering and seasonally migrating shorebirds (Colwell 1994; Hickey et al. 2003; Page et al. 2003). Depending on the season, up to 100,000 shorebirds reside in Humboldt Bay, with the Bay listed as an Important Bird Area (IBA) by the Audubon Society and an International Site in the Western Hemisphere Shorebird Reserve Network (Colwell 1994; Schlosser and Eicher 2012). At least 24 species of shorebirds including American avocets, sandpipers, dowitchers, plovers, godwits and dunlin utilize Humboldt Bay mudflat habitats for feeding, resting and/or roosting (Colwell, 1994; Danufsky and Colwell 2003; Dodd and Colwell 1998; Evans and Harris 1994; Long and Ralph 2001). Of these shorebirds, two thirds are listed as shorebirds of concern, or on the US Fish and Wildlife Service's Birds of Conservation Concern list (US Fish and Wildlife Service 2008; U.S. Shorebird Conservation Plan Partnership 2015). Various species of shorebirds utilize the many habitats available in the bay. Human disturbance and habitat destruction, specifically from oyster and shellfish farming, have been noted to have impacts to shorebird populations (Connolly and Colwell 2005; Hickey et al. 2003; Kelly et al. 1996; Pierce and Kerr 2004). Further, oyster and shellfish farming has been identified as a conservation issue for shorebirds in Humboldt Bay, and the restriction of further alteration of mudflats for oyster culture has been identified as a priority shorebird conservation goal for Humboldt Bay (Hickey et al. 2003). The impacts to shorebirds through increased disturbance and habitat loss may be significant, and the Department recommends avoidance, minimization and mitigation measures be developed to reduce the impacts to less than significant.

Pacific Herring (Herring)

Humboldt Bay is the third largest herring spawning site in California. Pacific herring, a forage species, are a critical component of coastal ecosystems in the NE Pacific Ocean (Cury et al. 2011, Pikitch et al. 2012). Along with other 'forage fish' species, herring serve as a vital link between lower and upper trophic levels. Herring are an important food source for economically valuable and federally listed salmonids (Hunt et al. 1999) and other piscivorous fish. A variety of birds, including black brant, surf scoters, scaup, buffleheads, and cormorants feed heavily on herring eggs during the winter, providing an important source of nutrition (Bayer 1980; Moffitt 1933; Moffitt 1939; Lok et al. 2012; Willson and Womble 2006). Herring eggs can make up a significant portion of the diet of the black brant during the spawning season, with herring eggs comprising 25% of prey volume consumed (Moffitt 1939). Marine mammal predators of herring include whales, seals and sea lions (Lassuy 1989).

Herring spawning grounds are typically located in sheltered locations such as bays, estuaries, and inlets. Spawning primarily occurs on vegetated substrates, although use of inorganic substrates, such as rock and pilings also occurs. The use of spawning sites can be variable; however, some herring spawning sites receive greater frequency and/or magnitude of use than other areas. Spawning sites that have a record of continued use are of significant importance to the population and should be prioritized for protection during development planning processes (Rabin and Barnhart 1986, Hay and McCarter 2014). Herring that enter Humboldt Bay spawn in several locations

throughout North Bay, and to a lesser extent in South Bay. Eelgrass beds in an area of North Bay, known as the East Bay Management Area (EBMA), have consistently been documented as the most important spawning beds in terms of both frequency and magnitude of use. Spawning surveys have been conducted during 12 years in Humboldt Bay, with herring spawning documented in the eelgrass beds of the EBMA 100% of the time (Rabin and Barnhart 1986; CDFW pers. comm. 2012). Spawning biomass estimates have been calculated during nine years in Humboldt Bay. A single eelgrass bed in the EBMA has accounted for a significant proportion of the Humboldt Bay total spawning biomass (47-91%) during six of the nine years surveyed (Rabin and Barnhart 1986; CDFW pers. comm. 2012).

The proposed CSF Project outlines significant expansion of operations in the EBMA area. The Department is concerned that potential impacts to eelgrass (outlined elsewhere in this document) in this area will significantly impact herring spawning habitat and have the potential to significantly impact the herring population. In addition, there is considerable uncertainty about the survival of herring eggs deposited on aquaculture gear relative to vegetated substrates, particularly with regard to the effects of desiccation, which has been shown to be a significant cause of mortality for inter-tidally spawned herring eggs (Steinfield 1971; Rooper et al. 1999). While intertidal spawning on hard structures does occur elsewhere within the range of Pacific herring, it has historically not occurred at any significant level in Humboldt Bay. The Department is concerned a large scale shift in the type of spawning substrate available to herring in the core spawning areas of the EBMA could have impacts on spawning success and negatively impact the population.

Longfin Smelt

Longfin smelt are listed as a threatened species in California and have been found throughout north Humboldt Bay, and as recently as December 2014 in the area off Indian Island (James Ray, CDFW, per. comm., December 2014; Sopher 1974; Pinnix et al. 2005; DeGeorges 1972; Chamberlain 1988; Wallace, CDFW, per. comm., December 2014). Longfin smelt feed on small invertebrates that can be found in large numbers in eelgrass habitats including copepods, gammarid amphipods and cumaceans (and as discussed in: Blackmon et al. 2006; see also: Chigbu and Sibley 1998; Feyrer et al. 2003; Hobbs et al. 2006; Moyle 2002). Large increases in non-native filter feeders have been shown to divert, "energy and nutrient flow from the primary consumers that longfin smelt eat" (as cited in Rosenfield and Baxter 2007; see also: Alpine and Cloern 1992; Feyrer 2003; Hobbs et al. 2006; Kimmerer 2002). This type of food shortage and fish species impact may occur given the size of the proposed Project expansion and has the potential to cause a significant impact.

Carrying Capacity

The IS includes an analysis of carrying capacity based on the model used by Gibbs (2007) (Section Bio-A6; H.T. Harvey & Associates 2014). Gibbs (2007) utilizes three 'performance' indicators including the clearance efficiency (CE) to determine the level of interaction between abundance of cultured species and the water column environment. The CE is the ratio between the number of days the water takes to clear an estuary and

the number of days it would take for cultured filter feeders to process all the water in the estuary (Gallardi 2014). Gibbs (2007) states that a CE of <0.05 would not induce significant impacts, while a value of 1.0 or greater indicate that filtering rates are greater than can be replenished by flushing. While the IS does not set a threshold level for significance, the reported estimated values for CE are 0.105 for existing aquaculture Projects. This estimate suggests that >10% of the available daily average phytoplankton is already being consumed by current aquaculture activities. The CE estimate is 0.741 for all projects, which approaches 75% of the available daily average phytoplankton. While a threshold for this indicator was not established in the IS, the information provided in the analysis as currently calculated suggests the proposed increase in shellfish culture could greatly reduce available food resources to native filter-feeding invertebrates in the Bay.

In addition, there are concerns with how the model was run in the H.T. Harvey & Associates 2014 document. The analysis utilized the total annual production of phytoplankton estimated for North Bay and calculated an average daily rate. Utilizing this number can potentially overestimate the amount of phytoplankton available in North Bay during times when phytoplankton levels are at their lowest. These times of phytoplankton minima are when non-cultured filter feeders are most vulnerable to loss of food by cultured animals. The Department recommends the model be re-run utilizing a value of phytoplankton abundance calculated by taking the "7 day average" of phytoplankton minima over a 10 year period in Humboldt Bay. This will provide a more useful estimate of the potential impacts of the Project on carrying capacity of the Bay. The Department also recommends the analysis include estimates of how carrying capacity is predicted to change as a result of climate change, including an estimate of error for the performance indicators provided, and include thresholds for significance for all the performance indicators reported.

Night Operations

Operations are proposed to occur on intertidal mudflats during the night. The Project proposes to utilize large lights to illuminate the tidal flats, as well as headlamps. As shorebirds are known to utilize intertidal areas at night, the use of lights during the night time operations could impact shorebirds utilizing Humboldt Bay (Dodd and Colwell 1996; Conklin et al. 2007). If night time operations are necessary, the Department recommends that CSF investigate mitigation measures that will reduce potential impacts to shorebirds to less than significant.

Reasonably Foreseeable Probable Future Projects

CEQA Guidelines state that all reasonably foreseeable probable future projects should be included in the evaluation of cumulative impacts (CEQA Guidelines § 15355). While the IS includes the current expansion project proposed by the Humboldt Bay Harbor, Recreation and Conservation District (HBHD), future CEQA documents should also include the additional proposed aquaculture expansion project announced by the HBHD CEO Jack Crider on January 29th, 2015 in Eureka, California. It was also recently reported that CSF was making plans to utilize an existing abandoned industrial site from

the HBHD (Times Standard February 2, 2015). Any future CEQA document should also include any plans for shore-based expansion related to the current proposed Project.

Cumulative Impacts

There are currently approximately 400 acres of intertidal aquaculture (from all sources) in Humboldt Bay and an additional 521 acres being proposed from the HBHD Expansion Project (in addition to the 622 proposed as part of the Project). Cumulatively these Projects would increase the number of acres used for aquaculture purposes in Humboldt Bay by 384% to approximately 1,530 acres. While the Project individually is expected to result in significant unavoidable impacts to the environment, the cumulative impacts from both proposed projects need to be thoroughly evaluated.

Conclusion

In an email dated January 23, 2015 George Williamson, the District Planner for the HBHD, stated the HBHD was, "requesting input regarding the Project's potential environmental effects and whether a Mitigated Negative Declaration or Environmental Impact Report should be prepared". As previously stated in our letter dated July 11, 2014 (attached), along with the concerns and comments provided in this letter, the Department concludes the proposed Project has the potential to cause significant impacts to the environment and resources of Humboldt Bay. Therefore, the Department recommends that an Environmental Impact Report be prepared to clearly identify potential impacts and alternatives to avoid, reduce, and/or mitigate for unavoidable impacts.

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

Sincerely,

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Attachments: CDFW Comment Letter. Coast Seafood Company Renewal and Expansion of Aquaculture Operations in Humboldt Bay, CA. July 11, 2014.

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CHARLTON H. BONHAM, Director

July 11, 2014

Dan Berman
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SUBJECT: COAST SEAFOOD COMPANY RENEWAL AND EXPANSION OF AQUACULTURE OPERATIONS IN HUMBOLDT BAY, CA

Dear Mr. Berman:

The California Department of Fish and Wildlife (Department) has reviewed the Humboldt Bay Harbor, Recreation and Conservation District's (HBHD) Notice of Application for the Coast Seafood Company's Lease Renewal and Expansion Project (Project). The Project proposes to continue Coast Seafood Company's (CSF) existing operations on 296 acres, discontinue operations on 6.6 acres, and expand operations into an additional 621 acres of intertidal wetland habitats. There is currently an approximately 400 acre total footprint of intertidal aquaculture from all sources in Humboldt Bay, therefore this Project would substantially increase the number of acres used for intertidal aquaculture purposes in Humboldt Bay.

As a trustee for the State's fish and wildlife resources, the Department has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants and the habitat necessary for biologically sustainable populations of those species pursuant to California Fish and Game Code §1802 (Fish and Game Code). In addition, the Department is recognized as a "Trustee Agency" under the California Environmental Quality Act (CEQA Guidelines §15386). The Department has recommended verbally to the HBHD on two separate occasions (June 2014 and July 3, 2014) that the potential unavoidable significant environmental impacts due to the proposed Project should be analyzed in an Environmental Impact Report (EIR). The purpose of this letter is to provide the HBHD with the Department's recommendation regarding the potential need for an EIR for this Project.

Biological Significance

Humboldt Bay is the second-largest estuary in California and consists of Arcata (North) Bay at its north end, Central Bay and South Bay. Humboldt Bay contains a number of diverse habitats, including tidal flats, salt marsh and eelgrass beds. At least 110 species of fish have been reported from Humboldt Bay, including many commercially important species, and several species of salmonids that spawn in the associated

tributaries (Gotshall et al. 1980; Barnhart et al. 1992). Humboldt Bay, and its wetlands and dunes, are habitat for at least 20 State and federally listed species, and numerous California Species of Special Concern (SSC) and provide important feeding and rearing habitat for fish.

Unavoidable Significant Environmental Impacts

Various avoidance and minimization measures can be utilized to reduce some of the potential significant impacts to the environment as a result of new aquaculture operations. However, a multitude of significant unavoidable environmental impacts have been well documented in the literature, and are likely to occur for this Project, due to the nature of aquaculture operations. Some of these unavoidable impacts include: physical habitat alteration, changes in species presence and abundance, increases in invasive species, disturbance to wildlife, sediment accretion and loss, changes to wetland function, and conversion of unaltered intertidal mudflat habitats to altered hard substrate communities (Dumbauld 2009; Hosack et al. 2006; Kelly et al. 1996; McKindsey et al. 2006; Quintino et al. 2012; Rumrill and Poulton 2004).

For example, significant unavoidable impacts from aquaculture operations are likely to affect several bird species that utilize the bay for feeding, resting, and as a migration corridor. Humboldt Bay is an internationally important site for overwintering and seasonally migrating shorebirds and waterfowl (Barnhart et al. 1992; Colwell 1994; Lee 2001; Page et al. 1999). Multiple unavoidable significant impacts to shorebirds are likely to occur due to the proposed expansion of aquaculture activities into currently undisturbed intertidal wetland habitat. These impacts include alteration of food sources, loss of foraging habitat, and disturbance from noise (Connolly and Colwell 2005; Forrest et al. 2009; Kelly et al. 1996; and Quintino et al. 2012). Specifically, some bird species avoid aquaculture areas located on mud flats that would otherwise utilize this habitat, thus substantially reducing the habitat available for feeding and resting (Connolly and Colwell 2005; Kelly et al. 1996). Also, the alteration of bird foraging habitats by aquaculture structures and activities change the quality of the environment favoring some species over others (Connolly and Colwell 2005; Kelly et al. 1996; and Quintino et al. 2012).

Conclusion

The HBHD has consulted with the Department regarding the appropriateness of either an Initial Study (IS) and Mitigated Negative Declaration (MND), or an EIR for the proposed Project. Pursuant to CEQA §15070(a), a Lead Agency shall prepare, or have prepared, a negative declaration or a MND when the IS shows there is no substantive evidence, in light of the whole record before the agency, that the Project may have a significant effect on the environment. Current studies of aquaculture impacts to the environment, as explained above, indicate that significant impacts may occur due to the

proposed Project and is likely to substantially degrade the quality of the environment and substantially reduce the habitat for fish or wildlife species [CEQA Mandatory Findings of Significance §15065 (a)(1)]. Therefore, the Department recommends the Lead Agency prepare an EIR for the proposed Project unless it can demonstrate the criteria justifying preparation of an MND pursuant to CEQA §15070 are met.

The Department appreciates the opportunity to review and comment on this Notice of Application. As always, Department personnel are available to discuss our comments, concerns, and recommendations in greater detail. To arrange for discussion, please contact Rebecca Garwood, Environmental Scientist, California Department of Fish and Wildlife, 619 2nd Street, Eureka, California, 95501, phone (707) 445-6456, and email Rebecca.Garwood@wildlife.ca.gov.

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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

North Coast Regional Water Quality Control Board

February 23, 2015

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

Dear Mr. Crider:

Subject: DRAFT Initial study Coast Seafood Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project issued on January 20, 2015.

File: Coast Seafood Company – Mariculture Activities WDID No. 1B01140WNHU, ECM PIN: CW-215003

Thank you for the opportunity to comment on the *DRAFT Initial study Coast Seafood Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project* issued on January 20, 2015 (DRAFT IS).

The North Coast Regional Water Quality Control Board (Regional Water Board) has issued Clean Water Act section 401 water Quality Certifications on April 18, 2007, and April 25, 2012, for activities associated with Coast Seafood shellfish culture operations that impact waters of the US. The DRAFT IS does not identify the Regional Water Board as a public agency whose approval is required for the expansion of these activities (p. 22, section 3.6). The Draft IS project description indicates that Coast Seafood's currently permitted shellfish culture activities would be continued and expanded causing new impacts (fill of wetlands) that will necessitate review and regulatory approval from the Regional Water Board. The impacts described in the DRAFT IS would need to be regulated under the Clean Water Act and the Porter Cologne Water Quality Control Act by the Regional Water Board. We request that our agency be listed in section 3.6 when the DRAFT IS is released for public comment. As lead CEQA agency this should be appropriately considered in the document.

The Regional Water Board has determined that the placement of "stakes" "posts" or other material that is permanently placed into sediment within wetlands (waters of the state) is a "fill" and requires appropriate review and regulatory permitting from our agency. These regulatory measures may include Clean Water Act section 401 Water Quality Certification, Water Discharge Requirements (WDRs) or Waiver of WDRs as necessary. Additionally, the proposed placement of approximately "1.03 acres of additional benthic footprint" (P. 37, Bio-A9) of this fill material may permanently impact wetland functions and beneficial uses causing significant impacts to the environment and may necessitate mitigation measures. These measures may include appropriate agency permitting and possibly compensatory mitigation in order to comply with the Clean Water Act and state and federal "no net loss" wetlands policies. Without appropriate review and permitting the Regional Water Board does not concur with the assessment that Coast's proposed activities would have "less than significant impact" on Biological Resources (P. 29, section IV.(c)). The Regional Water Board's assessment is that the proposed activities may be considered "less than significant with mitigation" with the inclusion of our agency in the permitting process so that appropriate mitigation may be identified if necessary.

Any adverse impacts to, or loss of, natural wetlands, or other waters of the state, and their beneficial uses due to these development and construction activities must be fully permitted and mitigated. Impacts to waters of the State should first be adequately evaluated to determine if the impacts can be avoided or minimized. All efforts to first avoid and second to minimize impacts to waters of the State must be fully exhausted prior to deciding to mitigate for their loss. If a project's impacts to waters of the State are deemed unavoidable, then compensatory mitigation (for acreage, function and value) will be necessary for any unavoidable impacts.

Thank you for considering these comments on the DRAFT IS. The Regional Water Board appreciates the opportunity to participate in Mitigation Measure Bio-2 to develop and implement an eelgrass monitoring and adaptive management program.

Sincerely,

Gil Falcone

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Date: 2015.02.23 12:05:19 -08'00'

Gil Falcone
Environmental Scientist

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cc: Robert Smith, Coast Seafood, robert@plauchecarr.com
Rebecca Garwood, CA Department of Fish and Wildlife, Rebecca.Garwood@wildlife.ca.gov
Cassidy Teufel, CA Coastal Commission, Cassidy.Teufel@coastal.ca.gov

February 27, 2015

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

RE: Comments on Initial Study for Coast Seafoods Company's Proposed Humboldt Bay Expansion

Dear Mr. Crider

The California Waterfowl Association (CWA) would like to submit the following comments on the *Initial Study: Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project*. We urge the district to reject the currently proposed project and, at a minimum, require a full Environmental Impact Report (EIR) before this or any similar proposal proceeds.

CWA is a 20,000 member nonprofit conservation organization dedicated to the conservation of California's waterfowl, wetlands and hunting heritage. As such, we are particularly concerned about the negative effects of the proposed project on waterfowl, most notably Pacific black brant, as well as recreational hunting opportunity.

Impacts to Pacific black brant and other waterfowl species which depend upon eelgrass

Humboldt Bay contains approximately 5,646 acres of eelgrass, which represents between 45%-53% of the state's total eelgrass. Eelgrass is one of the most productive of aquatic habitats, but its overall low statewide abundance makes it one of the rarest of all habitats in California. Collectively just 6 Bay ecosystems (Humboldt Bay, San Francisco Bay, San Diego Bay, Mission Bay, Morro Bay and Tomales Bay) support greater than 80% of the known eelgrass beds in the state, and eelgrass acreage continues to decline significantly in some areas such as Morro Bay.

Healthy eelgrass is vital foraging habitat for many waterfowl, including canvasback and other diving duck species, as well as some puddle duck species such as wigeon. But it is particularly critical to the black brant goose, California's only sea goose, constituting by far the most important element of its diet. (To highlight this fact, during the 1930s, a disease decimated eelgrass beds and black brant populations declined significantly.) Black brant are a bird of Management Concern and a Focal Species of the U.S. Fish and Wildlife Service. They breed thousands of miles from their wintering grounds in California, migrating to the coastal areas of the Arctic which uses up to 25% of their entire body weight. Any

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compromise in their ability to make that migration due to insufficient food resources could lead to either direct mortality during migration or reduced reproductive potential.

Humboldt Bay's eelgrass beds host over 80,000 brant geese, or 60 percent of the total brant goose population in the Pacific Flyway each year. This specialization on eelgrass makes the Pacific brant particularly vulnerable to forced changes in their environment, and aquaculture has the greatest potential for degrading wintering and staging habitats.

Available scientific studies demonstrate that aquaculture negative affects brant. The Initial Study acknowledges that "brant may be required to expend additional energy to relocate to areas without aquaculture structure." (Initial Study, at 43) Studies show that brant change their seasonal use patterns due to habitat disturbance. In Washington State, for example, oyster farming activities were correlated with reductions in eelgrass abundance and in turn, significant decreases in brant use-days.

In addition, eelgrass is essential spawning habitat for herring, whose roe is a vital food source for many bird species, including brant and other waterfowl. Pacific sea ducks are more dependent on herring than any other taxa of birds. Harlequin ducks aggregate in British Columbia only when feeding on herring spawn, while long-tailed ducks and Steller's eiders seek out and preferentially feed on herring roe. Scoters in particular are highly dependent on herring roe for overwinter survival and breeding success. Scoters dramatically alter their movement and habitat use patterns in spring to take advantage of ephemeral and energy-rich herring roe, suggesting that this food resource is of particular importance to these species.

Impacts to waterfowl hunting

Black brant are highly sought after by waterfowl hunters, who have historically provided the most important assistance to the U.S. Fish and Wildlife Service and Department of Fish and Wildlife for waterfowl conservation efforts via their purchase of state and federal duck stamps, reporting of bird bands, participation in wing bee surveys, voluntary habitat enhancement efforts and support of nonprofit waterfowl conservation groups.

Along with Morro Bay, Humboldt Bay is arguably the most important hunting area for black brant in California. In fact, a waterfowl tradition unique to Humboldt Bay was developed that centers around distinctive scull boat design, manufacture and use. In addition to waterfowl hunting, Humboldt Bay hosts other aquatic recreation, including fishing and wildlife viewing. The proposed project not only threatens to drive brant and other waterfowl away from Humboldt Bay due to resulting degradation and loss of eelgrass habitat, but will reduce and degrade scull boat and other waterfowl hunting opportunities. This significant impact should have been highlighted in the "Recreation" Section of the Initial Study.

Please also note that while Humboldt Bay is not considered a "recreational facility" by the Initial Study, it is a regionally important recreational venue for boat-dependent outdoor activities, including waterfowl hunting. These recreational activities—particularly hunting—are also protected under the Public Trust Doctrine when they occur on navigable waters.

As cited in State Attorney General Opinion 85-602:

"In Forestier v. Johnson, supra, 164 Cal. 24, 40, the Supreme Court stated: "...the hunting of wild game...is a privilege which is incidental to the public right of navigation."

"In People ex rel. Baker v. Mack, supra, 19 Cal. App. 3d 1040, 1048, the court interpreted Forestier as recognizing "that members of the public had an absolute right to navigate and hunt in small boats" on navigable waters."

As such, any public entity with jurisdiction over navigable waters should ensure that mariculture leases to private interests are compatible with boat-dependent, public recreational activities, including hunting, and do not diminish those Public Trust uses.

Please also note that CWA strongly disagrees with the following statement on page 42 of the Initial Study: "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)." This statement wrongly assumes that regulated hunting, which is guided by science and intensely managed on annual basis by both the federal and state governments, adversely affects waterfowl populations. Is also ignores the fact that many other waterfowl species which have much longer seasons and higher bag limits are currently at or near record populations levels (since surveys began in 1955).

Rather, it is the quantity and quality of available habitat that has by far the greatest impact on game species' abundance, including waterfowl. The proposed project, not regulated hunting, will directly and negatively impact critical waterfowl habitat. As such, reducing bag limits on brant is not an appropriate mitigation measure.

Conclusion

The proposed project would more than double the amount of existing mariculture in northern Humboldt Bay. It would add 621 acres of mariculture operations, mostly in eelgrass. In fact, the majority of the proposed expansion – 531 acres – would occur in dense eelgrass (>84% cover), degrading as much as one third of the remaining eelgrass in the North Bay. The impacts from the project are potentially even larger given the 550 acres of proposed expanded mariculture that the Harbor District is also proposing. Together, the two projects would nearly quadruple existing operations and compromise hundreds of acres of eelgrass, as well as traditional black brant hunting areas.

Because of the sensitivity of the eelgrass habitat and of brant geese to habitat loss and disturbance, we strongly disagree with the Initial Study's conclusion that the project would result in less than significant impacts with mitigation. The Initial Study clearly underestimates the impacts of the project on eelgrass. The Initial Study also lacks adequate information to assess the viability of its mitigation measures. Disturbance to eelgrass is notably difficult to mitigate and available studies indicate that eelgrass disturbed by mariculture tends to be less productive.

The project is even more threatening given that eelgrass already faces significant threats due to historic declines, changes in sea levels and temperatures, competition from invasive plants, and disease.

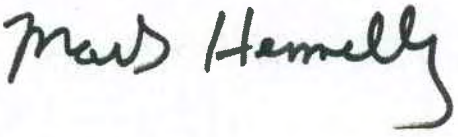
Responding to the threats faced by eelgrass, the National Marine Fisheries Services set a goal of "no net loss" as part of its California Eelgrass Mitigation Policy.

The project will ultimately make Humboldt Bay far less attractive to black brant and other waterfowl by degrading eelgrass habitat and reducing food resources. As a result, hunting opportunities will be diminished. In particular, traditional scull boating opportunities will be negatively impacted.

We therefore ask the Harbor District to reject Coast Seafood's request for a mitigated Negative Declaration and require, at a minimum, that a full Environmental Impact Report be completed. The Harbor District should ensure that any subsequent project does not result in any loss or degradation of Humboldt Bay's eelgrass beds, and does not negatively affect black brant populations or associated public hunting areas.

Thank you for your time and consideration.

Sincerely,



Mark Hennelly, Vice President of Legislative Affairs and Public Policy
California Waterfowl Association

February 23, 2015

Mr. Jack Crider, Exec. Director
Humboldt Bay Harbor, Recreation and Conservation District
PO Box 1030
Eureka, CA 95502-1030

Dear Mr. Crider and Commissioners:

We were sorry to read about the possible encroachment of oyster farming in Humboldt Bay that will take up to 600 acres of prime eelgrass beds.
The eelgrass beds are critical for migrating Brant. Eelgrass makes up 95% of their diet. Therefore they are dependent on finding eelgrass in bays and estuaries as they make their way north/south during their spectacularly long migration, from Baha California to the north slope of Alaska's coastal plain.
It seems clear to us that oyster farms have many possible shore locations that wouldn't infringe on the survival of migrating birds. Black brant don't have a choice on location except where the eelgrass grows.
This issue is near and dear to me as we have spent several days in your cities in the spring at least three times, expressly to see the lesser Canada geese, brant, and numerous shorebirds. Your shores are a treasure that needs utmost protection. The survival of black brants depends on your habitat protections.

Sincerely,
Walter Moorhead
Carol Ross
PO Box 1140
Wrangell, AK 99929

James S. Sedinger
30 Sagittarius Court
Reno, NV 89509

9 March 2015

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

Dear Director Crider and Commissioners:

I respectfully submit the following comments on the proposed Coast Seafoods Company, Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. I have studied Black Brant on their primary breeding grounds in western Alaska for more than 30 years and I focus on impacts to brant of the proposed expansion. I am especially concerned about the proposed expansion of mariculture activity in North Humboldt Bay because of the impact on eelgrass and consequently on Black Brant.

The proposed project would add 622 acres of operations, mostly located in eelgrass, likely resulting in the degradation or loss of as much as one third of the remaining eelgrass habitat in the North Bay. When combined with other proposed expansions of mariculture the Coast Seafoods proposal would nearly quadruple the size of mariculture operations in the North Bay, thereby degrading or eliminating large portions of eelgrass habitats.

Black Brant are a species of conservation concern in California (10) and the Pacific Flyway (4). While fall counts have increased over the past decade, numbers on the principal breeding area in western Alaska have declined over the last two decades (11,12), associated with recruitment rates that are too low to sustain the population (6). Survival of young of the year has declined steadily over the same period (5), in spite of exceptionally low rates of hunter harvest during the same period (5,7). Availability of eelgrass on winter and spring migration areas is directly tied to the ability of Black Brant adults to breed successfully the following summer (8,9) because migrating geese must repeatedly store fat to fuel each migratory flight before departing each spring staging area (5). Individual geese with insufficient fat stores fall behind in migration and eventually do not breed successfully (5). As pointed out above, this phenomenon also occurs across the entire population when food is inadequate to allow individuals to fatten sufficiently.

Human development along the California coast has left Humboldt Bay as the largest remaining stand of eelgrass between wintering areas in Mexico and Willipa Bay-Puget Sound (a distance of 1400 miles), along the spring migration route for brant. As such, Humboldt Bay now plays a critical and likely irreplaceable role in the fulfilling of

nutritional requirements of brant during spring migration. The majority of the brant population wintering in the continental US and Mexico now uses Humboldt Bay during spring migration (3). Any disruption of brant use of eelgrass in Humboldt Bay is expected to negatively affect recruitment of new brant into the breeding population.

Black Brant are sensitive to human disturbance on wintering and migration areas (1,2,14) so activities associated with oyster mariculture, even if they had no impact on eelgrass, will displace brant from affected eelgrass beds, reduce their foraging efficiency and reduce their ability to deposit fat necessary for migration and breeding. Humboldt Bay's strategic location and use by a large proportion of the Pacific brant population, mean that such effects are highly likely to reduce recruitment of new individuals into the population.

In summary, Humboldt Bay is a critical resource for migrating Black Brant. Any disruption of their ability to feed on eelgrass in Humboldt Bay is likely to have negative consequences for the population. Thank you for considering my comments.

Sincerely,

James S. Sedinger, Professor
Wildlife Ecology

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February 27, 2015

George Williamson
District Planner
Humboldt Bay Harbor, Recreation and Conservation District
P.O. Box 1030
Eureka, Ca 95501

Re: **Draft Initial Study – Coast Seafoods Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project**

Dear Mr. Williamson:

Thank you for soliciting input from the California Coastal Commission (Commission) staff on the draft Initial Study for the Coast Seafoods Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. This Coast Seafoods Company (Coast) proposal for 910 acres of commercial shellfish aquaculture operations in Humboldt Bay would approximately triple the size of its operations there and significantly increase the amount of aquaculture activities occurring within areas that currently support eelgrass (*Zostra marina*). As such, the proposal raises a number of complex scientific questions and potential policy concerns under the Coastal Act and we appreciate the early engagement and consultation efforts of both the Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District) and Coast, including soliciting our feedback on this draft Initial Study. Since this Initial Study is a draft only and has not been finalized, please consider these comments preliminary. When a final Initial Study or Notice of Preparation of an Environmental Impact Report is released for formal public review and comment, we may have additional questions and comments.

In 2006, the Commission granted Coast a coastal development permit (CDP No. E-06-003) for commercial aquaculture operations on approximately 300 acres in Humboldt Bay (roughly one-third of the area included in the current proposal). While this permit is set to expire in 2016, it may be extended through a permit amendment. It is our understanding that Coast intends to submit an amendment application soon for continuation of this 300 acre operation. The addition of 600 acres of new shellfish cultivation activities to Coast's operation in Humboldt Bay would require a new coastal development permit and we anticipate that Coast will also submit an application for this permit soon.

The Commission and its staff will therefore rely in part on information developed through the Harbor District's California Environmental Quality Act (CEQA) review in evaluating the proposed project's conformity with the resource protection policies of the Coastal Act. The

Commission staff is therefore interested in ensuring that this proposed project receives a comprehensive and robust CEQA review and that the analysis of potential project impacts, alternatives, and cumulative effects is thorough, independent, and supported on a strong scientific foundation. We strongly believe the proposed project may have a "significant effect on the environment" as defined by CEQA and therefore the Harbor District must prepare an environmental impact report (EIR).

Further, we encourage the Harbor District to consider convening a Joint Review Panel of the relevant "responsible agencies" to collaborate in the preparation of this EIR. The State Lands Commission, in its role as CEQA lead, frequently convenes Joint Review Panels for complex, controversial projects similar to this one that involve multiple agency permit requirements. We believe that allowing the resource agencies to share in the task of preparing the EIR on this project will help avoid duplication of staff efforts, facilitate sharing of staff expertise and existing information, promote early and frequent intergovernmental coordination and issue identification, and serve the public interest by producing a more efficient and thorough environmental review process. We hope the Harbor District will take seriously this suggestion and we can provide you additional information and models for how to implement this Joint Review Panel process.

Regarding the specific content and analysis included in the draft Initial Study, we would like to provide the following input and suggestions:

Biological Resources

1. *Shellfish Culture Equipment Spacing:* The Coast project proposes approximately 600 acres of new shellfish cultivation operations in areas of patchy to dense eelgrass. The draft Initial Study concludes that the proposed spacing of 2.5ft to 3ft of shellfish culture equipment will prevent adverse impacts to eelgrass in this 600 acre area. This conclusion is key to the draft Initial Study's finding that the proposed project would have a less than significant impact to eelgrass. We strongly disagree. There is no cited scientific justification for the draft Initial Study's finding regarding baskets on longlines and past research carried out on Coast's shell on longline operation demonstrates a contrary conclusion - that longline spacing of 2.5ft is associated with adverse impacts to eelgrass such as reductions in spatial coverage and density (Rumrill and Poulton 2004). The Commission cited this research in the findings supporting its 2006 permit decision for Coast and concluded that oyster culture using closely spaced long lines (i.e., 1.5-foot and 2.5-foot spacing) has a negative effect on the abundance of eelgrass in the culture areas. Therefore, the Commission staff believes the EIR must include a more accurate and science-based analysis and accounting of the proposed project's potential impacts to eelgrass. This analysis should include a thorough discussion and evaluation of impact avoidance and minimization measures – including project siting, sizing, and configuration alternatives – as well as mitigation measures for any impacts that may remain after the implementation of all feasible methods of impact avoidance and minimization.

2. *Marine Debris:* Shellfish aquaculture operations rely heavily on the placement, maintenance, and collection of artificial structures and materials in the marine

environment. This environment often presents challenges to these structures and materials due to unanticipated degradation, movement, burial, loss and discharge, potentially resulting in the creation and release of marine debris. If it remains uncollected, such debris may pose a threat to marine habitats and wildlife. Please include an analysis and discussion of this potential adverse environmental impact in the EIR along with avoidance, minimization, and/or mitigation measures that may be needed to properly address it.

3. *Herring Spawning:* The proposed best management practice to address potential adverse impacts to Pacific herring (*Clupea pallasi*) – BMP-9 – requires pre-work visual surveys of spawning from December through February and a two-week postponement and notification to the California Department of Fish and Wildlife if evidence of spawning is observed. This management measure is adapted from Special Condition 3 of the coastal development permit for Coast's current culture operations (CDP No. E-06-003). In the nearly ten years that this requirement has been in place, it has resulted in no reported observations of herring spawning activity. Given the observations recorded over the past ten years by the California Department of Fish and Wildlife of herring spawning activity in portions of Humboldt Bay in close proximity to Coast culture areas, the results of this monitoring effort are unexpected. We therefore recommend the EIR evaluate the effectiveness of this visual survey monitoring approach as a means of assessing spawning activity and avoiding adverse impacts to herring. The EIR should consider any adaptations or modifications to this management practice that may be warranted to ensure adverse impacts to herring spawning are avoided and/or minimized and to increase the accuracy of monitoring and accounting of potential operations impacts.

4. *Longfin Smelt:* Please include in the EIR a more thorough discussion of longfin smelt (*Spirinchus thaleichthys*) that includes a summary of the more recent documentation of their geographic and seasonal distribution in Humboldt Bay, such as that provided by the 2005 Pinnix et al. final report to the U.S. Fish and Wildlife Service, *Fish communities in eelgrass, oyster culture, and mudflat habitats of North Humboldt Bay, California*.

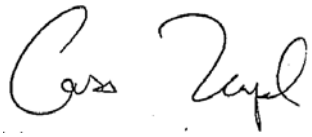
5. *Fouling Organisms and Non-native Species:* Please include in the EIR a discussion of the quantity and species composition of biofouling organisms growing on the shellfish cultivation infrastructure Coast currently maintains in Humboldt Bay – including the oyster shell, longlines, oyster baskets, and racks and bags. Please also describe opportunities for biofouling organisms to be released and/or dispersed into the marine environment during harvest activities carried out on these different cultivation structures and post-harvest shellfish cleaning and wash operations.

Visual Resources

6. *Scenic Vistas:* The discussion under section Aes-A (Scenic Vistas) notes the presence of numerous scenic vistas from both the shores and surface waters of Humboldt Bay near the project site. Please include in the EIR a map or figure indicating the number and location of these scenic vista points. Please also include visual simulations of the project sites from the nearest vista points to compare the current visual profile of the Coast operation to the proposed expansion at average low, mid, and high tides.

Thank you for your consideration of the comments included above. I look forward to continuing to work closely with you during the development of EIR. If you have any questions, please feel free to call me (415) 904-5502.

Sincerely,



CASSIDY TEUFEL
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Dear Mr. Marks, Humboldt Bay Harbor Commission President,

As someone who cares deeply about California birds and wildlife, I'm writing to ask that you and your fellow commissioners reject the proposal from Coast Seafoods' Company to expand aquaculture operations for oysters and other shellfish an additional 622 acres, almost exclusively into healthy eelgrass beds. This massive proposed project would convert an incredible 5% of the state of California's eelgrass and 11% of Humboldt Bay's eelgrass, to oyster farming,

Humboldt Bay is considered a globally significant Important Bird Area by the National Audubon Society and Birdlife International. The eelgrass beds and mudflats of Humboldt Bay support an incredible 60% of migrating Pacific Brant Geese, as well as between 10% to 20% of all wintering Marbled Godwits, Semipalmated and Least Sandpipers, and Willets, as well as tens of thousands of other shorebirds. These eelgrass beds are the heart of the Bay's Pacific herring run which provides essential food for Surf Scoters, Western Grebes, Clark's Grebes, and are recognized by federal and state agencies as vital for herring, salmon, Dungeness crab and other commercially important fish.

Eelgrass provides essential habitat for birds and wildlife, and it is recognized by the Magnuson-Steven Act as Essential Fish Habitat for its role as a nursery for young salmon and groundfish. Aquaculture of the type proposed for Humboldt Bay is not compatible with eelgrass which is why the State Department of Fish and Wildlife has a No Net Loss policy for eelgrass and does not permit aquaculture within 10 feet of eelgrass.

Eelgrass is one of the most sensitive and critical marine habitats on the West Coast. The science is unequivocal that aquaculture usually damages and can destroy eelgrass. There is also an emerging body of evidence that eelgrass cannot easily be encouraged to grow in new "mitigation" areas, as the proponents of the Humboldt Bay project assert.

While the project proponents claim that this expansion of aquaculture in Humboldt Bay will have no impact on birds and other wildlife, but the State Department of Fish and Wildlife says that "a multitude of significant, unavoidable environmental impacts are likely to occur" and that "it would likely affect several bird species."

Again, I urge you to reject Coast Seafood's' proposal to expand aquaculture operations in Humboldt Bay. Any change to existing operations must be subject to comprehensive environmental review.

Crystal Huggins	Help protect migratory bird Fri 2/27	15 KB
Julia Read	Help protect migratory bird Fri 2/27	15 KB
Erica Heimberg	Help protect migratory bird Fri 2/27	15 KB
Tim Ryan	Help protect migratory bird Fri 2/27	15 KB
Mary Lambert	Help protect migratory bird Fri 2/27	15 KB
Elizabeth Leite	Help protect migratory bird Fri 2/27	12 KB
Susan Fein	Help protect migratory bird Fri 2/27	15 KB
Heather Kennedy	Help protect migratory bird Fri 2/27	15 KB
Ty Beh	Help protect migratory bird Fri 2/27	15 KB
Peggy Harding	Help protect migratory bird Fri 2/27	15 KB
Robin Holcombe	Help protect migratory bird Fri 2/27	15 KB
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Jack Jones	Help protect migratory bird Fri 2/27	15 KB
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Kelly Grant	Help protect migratory bird Thu 2/26	15 KB
Kendy Lewis	Help protect migratory bird Thu 2/26	15 KB
John Griffith	Help protect migratory bird Thu 2/26	15 KB
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Emily Demmin	Help protect migratory bird Thu 2/26	15 KB
DuWayne Moberg	Help protect migratory bird Thu 2/26	15 KB
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Suni Johnson	Help protect migratory bird Thu 2/26	15 KB
Javier Mendez	Help protect migratory bird Thu 2/26	15 KB
Michael Terry	Help protect migratory bird Thu 2/26	15 KB
Laura Sternberg	Help protect migratory bird Wed 2/25	15 KB
Rosemary Meyers	Help protect migratory bird Wed 2/25	15 KB
Vidya Sims	Help protect migratory bird Wed 2/25	15 KB
Erik Nelson	Help protect migratory bird Wed 2/25	15 KB
Sharon Huyck	Help protect migratory bird Wed 2/25	15 KB
Scott Thomas	Help protect migratory bird Wed 2/25	15 KB
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Marsha Armstrong	Help protect migratory bird Wed 2/25	15 KB
Lynn Price	Help protect migratory bird Wed 2/25	15 KB
Shanna Brandow	Help protect migratory bird Wed 2/25	15 KB
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Karen and Gary Holm	Help protect migratory bird Wed 2/25	15 KB
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Valarie Welte	Help protect migratory bird Wed 2/25	15 KB
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Valerie Chu	Help protect migratory bird Wed 2/25	15 KB
Marco Pardi	Help protect migratory bird Wed 2/25	15 KB
Marilyn Meredith	Help protect migratory bird Wed 2/25	15 KB
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Marc Ruffolo	Help protect migratory bird Tue 2/24	15 KB
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Brigid McCormick	Help protect migratory bird Tue 2/24	15 KB
Virginia Collins	Help protect migratory bird Tue 2/24	15 KB
Mark Bradley	Help protect migratory bird Tue 2/24	15 KB
Tai Stillwater	Help protect migratory bird Tue 2/24	15 KB
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Daryl Struss	Help protect migratory bird Tue 2/24	15 KB
Paula DeFelice	Help protect migratory bird Tue 2/24	15 KB
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Brett Holland	Help protect migratory bird Mon 2/23	15 KB
Erin Howard	Help protect migratory bird Mon 2/23	15 KB
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Tracey Dunn	Help protect migratory bird Sun 2/22	18 KB
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Constance Youens	Help protect migratory bird	2/21/2015	15 KB
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Karen Hansen	Help protect migratory bird	2/21/2015	15 KB
Ricki Kartes	Help protect migratory bird	2/21/2015	15 KB

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Enrique Esparza	Help protect migratory bird	2/21/2015 15 KB
Clark Davis	Help protect migratory bird	2/21/2015 15 KB
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Larry Bartlett	Help protect migratory bird	2/21/2015 15 KB
Bill Connor	Help protect migratory bird	2/21/2015 15 KB
Andarin Arvola	Help protect migratory bird	2/21/2015 15 KB
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Jane Stillinger	Help protect migratory bird	2/21/2015 15 KB
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Charles Schussman	Help protect migratory bird	2/21/2015 15 KB
Regina Flores	Help protect migratory bird	2/21/2015 15 KB
Timothy Jackson	Help protect migratory bird	2/21/2015 15 KB
William Giordano	Help protect migratory bird	2/21/2015 15 KB
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Sara Paoluzzi	Help protect migratory bird	2/21/2015 15 KB
Geoff Kemp	Help protect migratory bird	2/21/2015 15 KB
Alexandre Kaluzhski	Help protect migratory bird	2/21/2015 15 KB
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Chris Schneebeli	Help protect migratory bird	2/21/2015 15 KB
JerryAnne Ford	Help protect migratory bird	2/21/2015 15 KB
Ronda Mohr	Help protect migratory bird	2/21/2015 15 KB
Kathleen Siskron	Help protect migratory bird	2/21/2015 15 KB
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James Olson-Lee	Help protect migratory bird	2/21/2015 15 KB
Serena Wittkopp	Help protect migratory bird	2/21/2015 15 KB
Jeffrey DiLallo	Help protect migratory bird	2/21/2015 15 KB
Rhonda Carr	Help protect migratory bird	2/21/2015 15 KB
Zara Ivanova	Help protect migratory bird	2/20/2015 15 KB
Michael Stone	Help protect migratory bird	2/20/2015 15 KB
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Kathryn Gray	Help protect migratory bird	2/20/2015 15 KB
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Tabitha Maya	Help protect migratory bird	2/20/2015 15 KB
Wendy Tripp	Help protect migratory bird	2/20/2015 15 KB
John Varga	Help protect migratory bird	2/20/2015 15 KB
Anne Parzick	Help protect migratory bird	2/20/2015 15 KB
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Frances Heath	Help protect migratory bird	2/20/2015 15 KB
JoAnn Kiva	Help protect migratory bird	2/20/2015 15 KB
Lynn Luther	Help protect migratory bird	2/20/2015 15 KB
Katrena crawford	Help protect migratory bird	2/20/2015 15 KB
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Tessa Williamson	Help protect migratory bird	2/20/2015 15 KB
Dana Belt	Help protect migratory bird	2/20/2015 15 KB
Laurel Jones	Help protect migratory bird	2/20/2015 10 KB
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Helen Woodfield	Help protect migratory bird	2/20/2015 15 KB
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George Latta, M.D., MBA	Help protect migratory bird	2/19/2015 15 KB
Francisca Salazar	Help protect migratory bird	2/19/2015 15 KB
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Laura Bathel	Help protect migratory bird	2/19/2015 15 KB
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groovee@ladolcev.com Groody	Help protect migratory bird	2/19/2015 15 KB
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Arlin Robins	Help protect migratory bird	2/19/2015 15 KB
Marc Hinoki	Help protect migratory bird	2/19/2015 15 KB
Ellaine Lurie Janicki	Help protect migratory bird	2/19/2015 15 KB
Barbara Holtz	Help protect migratory bird	2/19/2015 15 KB
Gail McMahon	Help protect migratory bird	2/19/2015 15 KB
Yvette Doublet-Weislak	Help protect migratory bird	2/19/2015 15 KB
Barbara Ward	Help protect migratory bird	2/19/2015 15 KB
Lynn Elliott	Help protect migratory bird	2/19/2015 15 KB
Vic Warren	Help protect migratory bird	2/19/2015 15 KB
Guillermo Gonzalez	Help protect migratory bird	2/19/2015 15 KB
Mirabai Nagle	Help protect migratory bird	2/19/2015 15 KB
Carol Savary	Help protect migratory bird	2/19/2015 15 KB
Ernie Looney	Help protect migratory bird	2/19/2015 15 KB
Edward White	Help protect migratory bird	2/19/2015 15 KB
Sandra Blackburn	Help protect migratory bird	2/19/2015 15 KB
Lisa Mastro	Help protect migratory bird	2/19/2015 15 KB
Nancy Webb	Help protect migratory bird	2/19/2015 15 KB
Audrey Johnson	Help protect migratory bird	2/19/2015 15 KB
Amanda Percy	Help protect migratory bird	2/19/2015 15 KB
Laura Divenere	Help protect migratory bird	2/19/2015 15 KB
Gayle Kirma	Help protect migratory bird	2/19/2015 15 KB
Mary Tanoury	Help protect migratory bird	2/19/2015 15 KB
Wendy Walwyn	Help protect migratory bird	2/19/2015 15 KB
Glenn Olson	Help protect migratory bird	2/19/2015 16 KB
Cynthia Grimm	Help protect migratory bird	2/19/2015 15 KB
Linda Phillips	Help protect migratory bird	2/19/2015 15 KB
Peggy Loe	Help protect migratory bird	2/19/2015 15 KB
Marc Daniel	Help protect migratory bird	2/19/2015 15 KB
Francis Farrell	Help protect migratory bird	2/19/2015 15 KB
Matthew Page	Help protect migratory bird	2/19/2015 15 KB
THOMAS MC DONNELL	Help protect migratory bird	2/19/2015 15 KB
Lynn Learch	Help protect migratory bird	2/19/2015 15 KB
Susan Hannan	Help protect migratory bird	2/19/2015 15 KB
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Dan Lahey	Help protect migratory bird	2/19/2015 15 KB
Elizabeth Larson	Help protect migratory bird	2/19/2015 15 KB
Michelle Carter	Help protect migratory bird	2/19/2015 15 KB
Pati Jio	Help protect migratory bird	2/19/2015 15 KB
John Clapper	Help protect migratory bird	2/19/2015 15 KB
Sabrina Thompson	Help protect migratory bird	2/19/2015 15 KB
Gerald Morris	Help protect migratory bird	2/19/2015 15 KB
Carol Ball	Help protect migratory bird	2/19/2015 15 KB
Eliah Perona	Help protect migratory bird	2/19/2015 15 KB
karen Lyons kalmenson	Help protect migratory bird	2/19/2015 15 KB
Caren Hanson	Help protect migratory bird	2/19/2015 15 KB
wade graham	Help protect migratory bird	2/19/2015 15 KB
Francie Curtiss	Help protect migratory bird	2/19/2015 15 KB
Timothy Tolbert	Help protect migratory bird	2/19/2015 15 KB
sandra Taylor	Help protect migratory bird	2/19/2015 15 KB
Robert L Davenport	Help protect migratory bird	2/19/2015 15 KB
Bonnie Faith-Smith	Help protect migratory bird	2/19/2015 15 KB
Nina Granlund	Help protect migratory bird	2/19/2015 15 KB
Thomas Pintagro	Help protect migratory bird	2/19/2015 15 KB
Alan Ross	Help protect migratory bird	2/19/2015 15 KB
Andria Richey	Help protect migratory bird	2/19/2015 15 KB
leslie spoon	Help protect migratory bird	2/19/2015 15 KB
Blaise Brockman	Help protect migratory bird	2/19/2015 15 KB
Rob Roberto	Help protect migratory bird	2/19/2015 15 KB
Erwin Pearlman	Help protect migratory bird	2/19/2015 15 KB
Shawna Watson	Help protect migratory bird	2/19/2015 15 KB
Fredrick Seil	Help protect migratory bird	2/19/2015 15 KB
Deimile Mockus	Help protect migratory bird	2/19/2015 15 KB
Christopher Adler	Help protect migratory bird	2/19/2015 15 KB
Donald Shaw	Help protect migratory bird	2/19/2015 15 KB
Vivian Kanchian	Help protect migratory bird	2/19/2015 15 KB
Janet Maker	Help protect migratory bird	2/19/2015 15 KB
MIchael Abler	Help protect migratory bird	2/19/2015 15 KB
Tim Mc Nemar	Help protect migratory bird	2/19/2015 15 KB
Richard Smith	Help protect migratory bird	2/19/2015 15 KB
Juli Jones	Help protect migratory bird	2/19/2015 15 KB
Vic Bostock	Help protect migratory bird	2/19/2015 15 KB
Janny Hazelaar	Help protect migratory bird	2/19/2015 15 KB
Danielle Tran	Help protect migratory bird	2/19/2015 15 KB
Sally Hill	Help protect migratory bird	2/19/2015 15 KB
David Marsh	Help protect migratory bird	2/19/2015 15 KB
Jennifer Jelinek	Help protect migratory bird	2/19/2015 15 KB

Coast Seafoods Initial Study Public Comment Meeting

Tuesday February 17, 2015 – 6:00 PM

Harbor District Meeting Room

The scoping meeting intent was to:

(1) Introduce the project and answer questions;

(2) Present the Initial Study and answer questions;

(3) Record comments regarding any environmental concerns that the public or agencies feel should be addressed further; and

(4) Record comments regarding the appropriate environmental determination.

The Project consists of:

- 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,
- Increasing shellfish culture within an already permitted floating upwelling system by adding eight culture bins, and
- Permitting an additional 622 acres of intertidal culture area.

District & Coast Seafoods Attendees

Jack Crider - Harbor District Executive Director
George Williamson & Juliette Bohn - District Planner
Robert Smith, Plauché & Carr LLP
Greg Dale, Coast Seafoods

Public Attendees

Rebecca Garwood
Steve Granthem
Julie Romo
Frank Shaughnessy
Stan Brandenburg
Jen Kalt
Susan Penn
Joe Tyburczy (others did not sign in)

Comment Summary

Comments received on potential environmental effects, related to Initial Study questions are listed below by checklist topic.

I. Aesthetics

C: Visual Character

- Small comment on aesthetics in areas that are going to be abandoned. Currently, there are pipes sticking out of ground – in abandoned areas. Non-natural material sitting there potentially causing harm, potentially breaking loose.

IV. Biological Resources

A: Effects on Candidate, Sensitive, or Special-Status Species

- The area that Stan and Steve talked about [See Bio-D4 comments] that is important to Black Brant is also important to the Herring – it is a Herring spawning area. With so many

impacts to Herring, Black Brant, Wigeons, why expand into that area at all? Cumulative impacts need to be analyzed.

A6: Changes in Abundance of Suspended Organic Matter and Related Effects on Native Species

- With regards to carrying capacity IS discusses removing phytoplankton & filtration rates – Coast Seafoods must know what the filtration rate is, but we don't know what the phytoplankton residence time is.
  [CS: Gibbs 2007 model for filtration of shellfish was used. For the analysis of recharge, 4 published models were used times to assess how quickly the bay flushes.]
- Quality of what is available on residence time and flush rate is inadequate.
  [CS: Health department has model based on dye studies]
- Jeff Anderson has other model that shows 30-day flush time. By increasing the amount of aquiculture, would that not effectively be a take on other creatures by decreasing the food available? Clams and creatures in the bay need that food too. Question about carrying capacity needs to be asked.
  [CS: Being dealt with using best analyses available.]
- Pacific oysters will set naturally in the bay; they are present in the Eureka Slough behind airport – now rocks full of oysters.

B: Effects to Habitats

- Recalled historical culture practices – changes to makes eelgrass healthier. Areas have recovered w/ new culture.
- HSU marine Botanist. Studies eelgrass. They are submitting a letter of what issues they see so far in IS. One thing they would like to see analyzed is the fact that existing structures must be impacting eelgrass due to loss of light. Interested in effects on shoot density. Like to see pilot work where science used to quantify effects on eelgrass – this can be used to build on the existing study. 10,000 Wigeon use that area.
- IS not sufficiently addressing mitigations for Eelgrass. Eelgrass has expanded since bottom culture was abandoned – that's why it was abandoned. To talk about impacting Eelgrass again, there needs to be some mitigation. Technically I believe this was called deferred mitigation in IS – but this needs to be done immediately. The insinuation is that because there will be some positive impacts, this outweighs the negative impacts to other species. If there are negative impacts to other species, this needs to be addressed.
- There could be a lot of value in revisiting use of long lines in higher density on what is being proposed. Of the 3,500 acres of Eelgrass, ½ grassy/patchy, and ½ is dense. 600 acres of 3,500 is sizable. As ecologist looking at 2004 work done by Rumrill and Poulton, it is a concern that the impacts were only studied for a couple of years. A lot of value in going back and sampling again to see what has occurred over long-term. Need to get longer-term data – the end point or consequence for Eelgrass would be informative. Eelgrass monitoring before and after impact; it would be a lost opportunity to not find a way to collect additional data. Would make scientists more comfortable with analysis.

D1: Effects to Wintering Migrating Shorebird Populations & Bio-D4: Effects to Black Brant

- New culture to impact Black Brant and Wigeon – shore birds that don't like long line culture. Suspect that this is because of predators. If you increase the culture area here (pointed to hexagonal area on lower right hand side of map), this is in a key Black Brant roosting and feeding area. Culture-related boat traffic will also impact bird's ability to rest and feed. Humboldt Bay is only area that these birds have to rest. So this area is very important. Birds will not simply "move down to South Bay" – some will, but others will be displaced. Understands this project good for business – but this expansion too aggressive. Specific concern is increase of long line culture in hexagonal area on "continued and expanded shellfish culture" slide.
- Eelgrass healthier than ever before. Was patchy – was stripped by Brant when hungry. Eelgrass is very long now, Brant has enough food. Within beds specifically.

VII. Greenhouse Gas Emissions

A: Greenhouse Gas Emissions

- Regarding ocean acidification due to increased greenhouse gas emissions – oyster growers in Humboldt Bay are concerned about that due to lack of ability to calcify and form shells. Ironically, marine photo synthesizers such as eelgrass are carbon limited – this potentially means that is if you have sea grass in your system, they will prevent the acidification in the bay.
  [CS – will algae do the same thing?]
- Not at same level. Use of eelgrass to keep water more basic. There is a program of ocean observing that is going on – if we have a big upwelling event – water gets super acidic. Have sensors on bay at various sites. Water gets very acidic in Trinidad, but does not get acidic in bay – hypothesis is that it is the eelgrass that is buffering pH. Oysters and Eelgrass may be compatible.

XIV. Recreation

A: Increase use of recreational facilities

- Initial Study (IS) came up short on impacts of recreation. Areas off of Braecut are important to waterfowl hunters. Many people hunt out of craft designed and perfected right here in the Humboldt Bay. Existing code for hunting in these waters not covered in IS – Fish and Game code only allows hunting on Wednesdays, Saturdays, and Sundays. Code states that hunters are allowed to hunt w/o interference on these days. (Steve) has had interactions with oystermen last year where they interfered with legal hunts. Impacts to hunting needs to be analyzed, IS needs to have mitigations on places and times of activities, and where they go on, and how they interact with legal waterfowl hunting.

XV. Transportation/Traffic

F: Alternative Transportation

- Concern: A 200% increase in land use – this is big. Above ground culture could present a hazard to navigation for boating. If you don't know where the beds are, you will get hung up, may get hurt, may damage motor. General public is clueless on navigating around beds. Significant increase in land is increase in hazard to navigation.
- When you look at total propose added acreage – roughly 300 acres in production – expanding to over 1,400 is too big a jump at one time. More of land was used in the past, but does not need to be used in the same way again.
- Structures just below surface can damage boats. A couple of materials that are produced in course of farming activity are not hazardous substances in and of themselves, but when in water can become hazardous. For example: recently pulled out 15 feel long red bags with slits in them – if you run over that with a boat with a propeller you will damage boat and/or put boaters in danger – loose materials from culture process could be a hazard to boaters.

XVII. Mandatory Findings of Significance

B: No cumulative impacts

- The IS discusses pre-permitting for expansion and culture, and impacts of carrying capacity. IS does not talk about cumulative impact of everything else. Both projects need to consider the other one in terms of all impacts. Black Brant, Eelgrass, acidic water, boating etc.
- Need to have an alternatives analysis. Neg. Dec. does not seem appropriate due to impacts already identified.

Coast Seafoods Permit Initial Study Scoping Meetiing February 17, 2015

The Harbor District as lead agency, will hold a Public Scoping Meeting for Coast Seafoods Permit Initial Study on Tuesday February 17 6:00 PM The meeting will be at Harbor District's Woodley Island Marina Meeting Room, 601 Startare Drive Eureka.

The intent of the scoping meeting is to:

(1) Introduce the project and answer questions;
(2) Present the Initial Study and answer questions;
(3) Record comments regarding any environmental concerns that the public or agencies feel should be addressed further; and
(4) Record comments regarding the appropriate environmental determination.

The Coast Seafoods Permit Draft Initial Study is posted on the Harbor District website.

The Project consists of:

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),

Increasing shellfish culture within an already permitted floating upwelling system by adding eight culture bins, and

Permitting an additional 622 acres of intertidal culture area.


Parcels Owned by Coast
Outer Boundary of Coast's Leases
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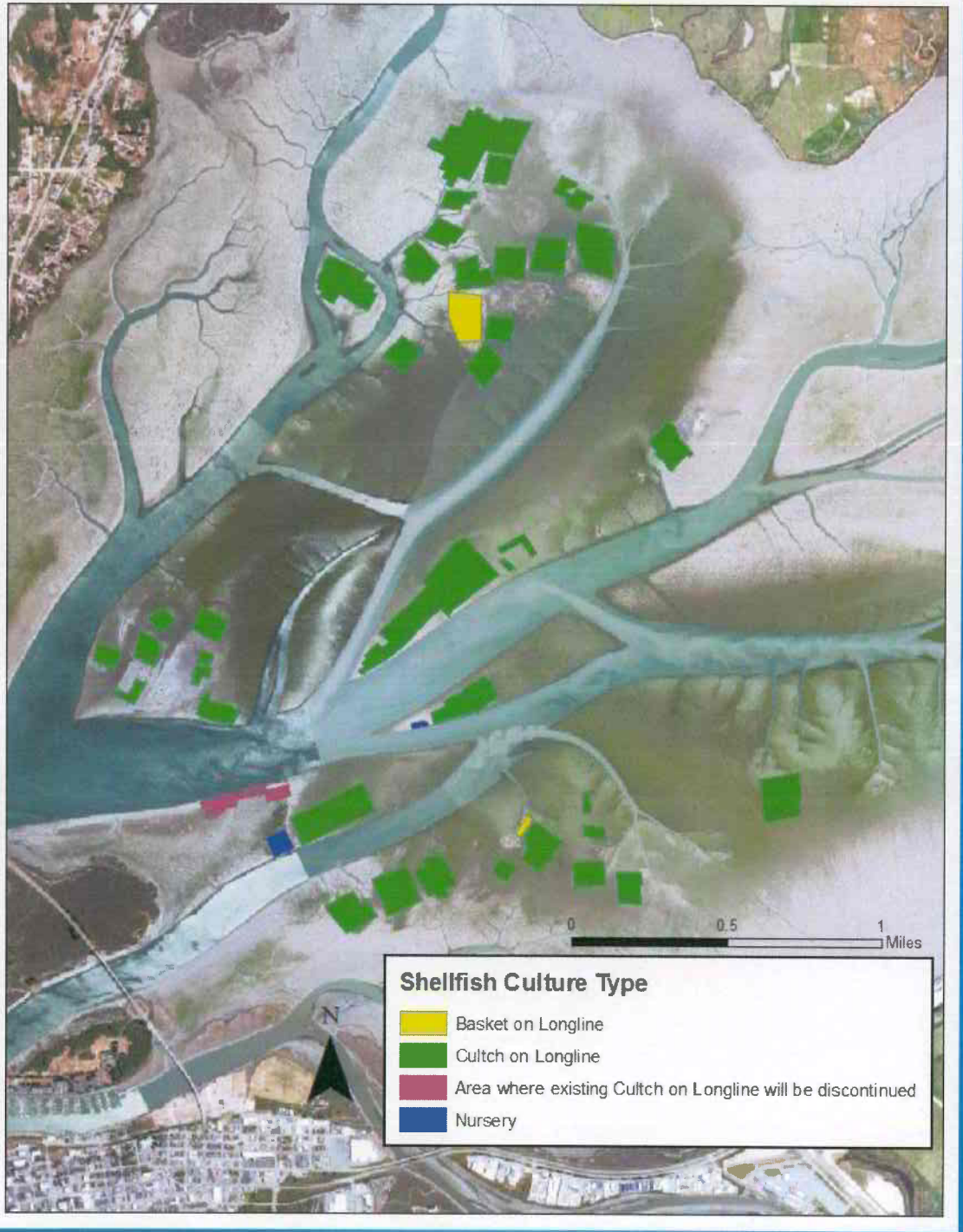
Miles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Miles
Shellfish Culture Type
Basket on Longline
Cultch on Longline
Area where existing Cultch on Longline will be discontinued
Nursery
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0 0.25 0.5
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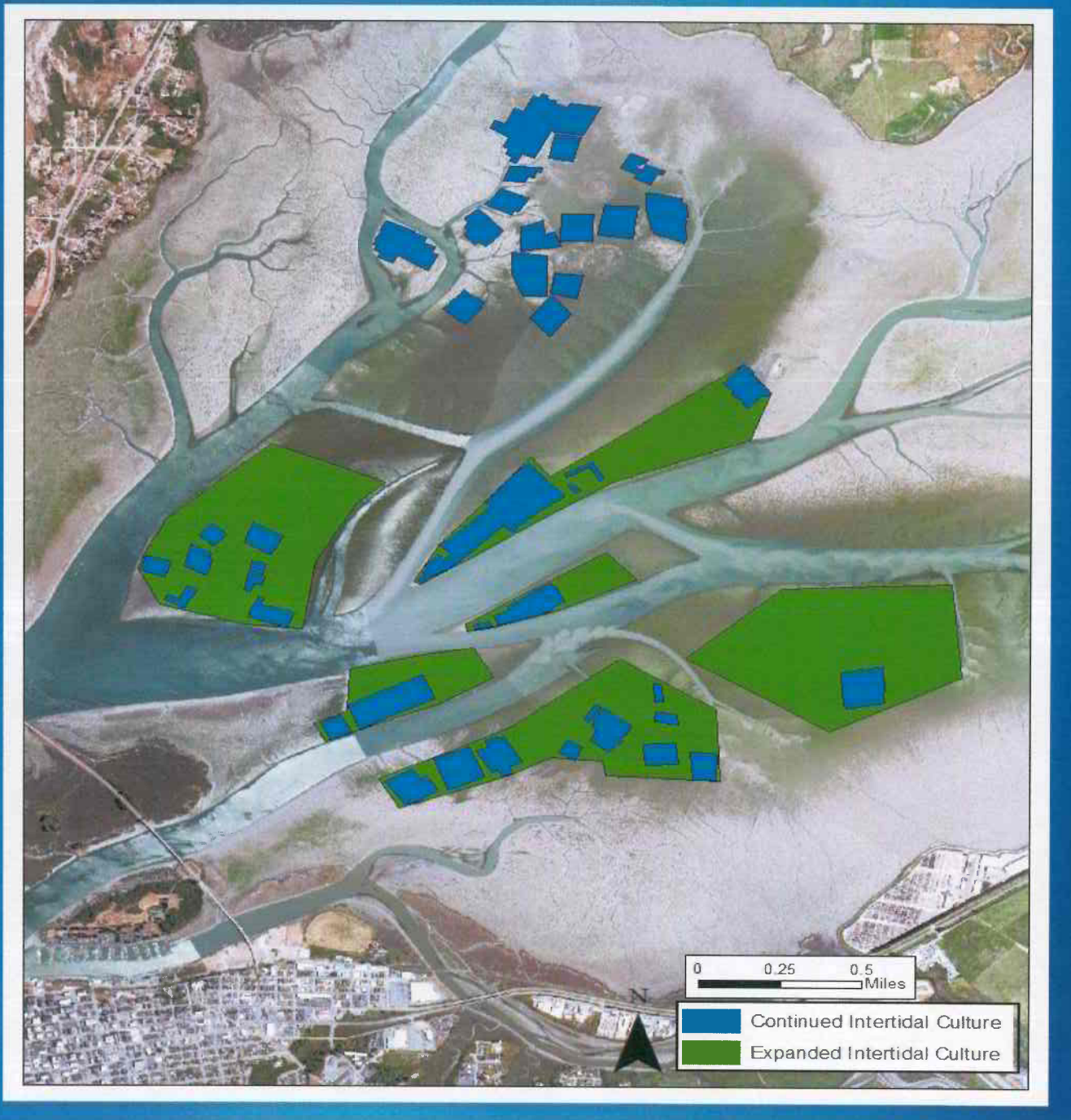
Shellfish Culture Type
Clam Rafts
Floating Upwelling System
Wet Storage Floats

Cultch on Long Lines

Rack and Bag

continued and expanded shellfish culture



September 21, 2015

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

Dear Mr. Wagschal,

We provide the following comments on the Notice of Preparation (NOP) and Final Initial Study of Coast Seafoods Shellfish Aquaculture Draft EIR. The proposed project is likely to have significant adverse impacts on sensitive habitats, commercially and ecologically important fish species, birds, and other wildlife, including state and federally protected species. Thus we fully agree that a full Environmental Impact Report must be completed to analyze the proposal's effects, as described below.

In our comments on the draft Initial Study, we described numerous concerns with the size, siting, and design of the proposed project. The project described in the Final Initial Study remains largely the same as Coast Seafoods' initial proposal and is likely to have similarly significant adverse impacts. Rather repeating our prior comments, we hereby attach our February 23, 2015 letter describing the significant, unavoidable impacts the project would have on natural resources including eelgrass habitat crucial for fish and invertebrates that support commercial and recreational fisheries, as well as numerous bird species; black brant and associated recreational hunting and bird watching opportunities; and numerous fish and wildlife species protected under state and federal law.

Pacific Seafoods, the parent company of Coast Seafoods, presented the proposed project at the Pacific Fisheries Management Council (Council) meeting in Sacramento, CA on 11 September, 2015. This included four changes or additions to the proposed project since the release of the Initial Study,[1] the main change being an increase in spacing between cultch and basket lines. Pacific Seafoods reported that "Longlines in expansion area (cultch and basket) will be at 5 ft intervals consistent with Rumrill (2015)" and quoted directly from Rumrill (2015): "Eelgrass beds and commercial oyster cultivation can coexist in Humboldt Bay, and that

[1] http://www.pcouncil.org/wp-content/uploads/2015/09/F1c_SUP_PC_ElectricOnly_CoastSeafoods_SEPT2015BB.pdf

implementation of best management practices that include reduced density of oysters (i.e., oyster culture at 5 ft and 10 ft spacing between the longlines) may aid in the conservation of eelgrass communities."[2]

Following Pacific Seafoods' presentation, the full Council agreed to re-send its July, 2015 letter to the Harbor District pertaining to the Coast Seafoods proposal and Harbor District Pre-permitting expansion proposal, with minor modifications. The Council notes in its letter that "Shellfish habitats are not functionally equivalent to that of eelgrass habitat. The role of eelgrass in the food chain, including serving as a substrate for spawning herring, is not replicated by cultured oysters." For the numerous reasons described in the Council's letter and our February 23, 2015 letter, we agree with this conclusion.

The Final Initial Study relies on Rumrill and Poulton (2004)[3] to justify the siting, line spacing, and other details pertaining to project configuration and management. Yet this unpublished study is flawed and as such unsuitable as a basis for finding that the proposed best management practices would result in less than significant harm to eelgrass. For example, the four experimental plots that were supposed to test spacing effects appear to be adjacent to one another and are therefore insufficiently independent to produce meaningful results. Furthermore, each experimental plot received a different "treatment," hence there was no replication of the "spacing" treatment necessary to determine whether the effect observed was due to the treatment or chance. Finally, the small sample sizes employed by the study as well as its unbalanced design and unequal population variance render the statistical analyses of the results unreliable.

Legal Background: California Environmental Quality Act

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

A. Analysis of Significant Impacts

CEQA requires that an "EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated and discussed and it must permit the significant effects to be considered in the full environmental context."[5] CEQA defines "significant effect on the environment" as "a substantial, or potentially substantial, adverse

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[2] Rumrill, S. 2015. Letter to Korie Schaeffer regarding eelgrass and shellfish aquaculture interactions from Humboldt Bay WRAC study. Oregon Department of Fish and Wildlife. April 5, 2015. steven.s.rumrill@state.or.us

[3] Rumrill, S. S. & V. K. Poulton. 2004. *Ecological role and potential impacts of molluscan shellfish culture in the estuarine environment of Humboldt Bay, CA. Annual Report to USDA Western Regional Aquaculture Center.* South Slough National Estuarine Research Reserve, Charleston, OR. 79 pp.

[4] Pub. Res. C. § 21001(a)-(d).

[5] CEQA Guidelines, § 15125(c), (emphasis added).

change in the environment."[6] In addition, an EIR "must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published…or…at the time the environmental analysis is commenced, from both a local and regional perspective."[7]

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

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

B. Analysis of Cumulative Impacts

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

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

C. Analysis of Alternatives

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[6] Pub. Res. C. § 21068.
[7] CEQA Guideline § 15125(a)
[8] CEQA Guidelines § 15358(a)(2).
[9] *Laurel Height Improvement Ass'n v. Regents of University of California*, 47 Cal.3d 376, 404 (1988).
[10] *Stanislaus Natural Heritage Project*, 48 Cal.App.4th at 182; *Citizens of Goleta Valley v. Board of Supervisors of Cty of Santa Barbara*, (Cal. 1990) 52 Cal.3d 553, 568.
[11] Guidelines § 15144; *see also* Guidelines § 15151 (an EIR must disclose what is "reasonably feasible").
[12] CEQA Guidelines § 15130; *see also* CEQA Guidelines § 15355.
[13] CEQA Guidelines § 15355.
[14] CEQA Guidelines, § 15130(b)(4).

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

D. Mitigation Measures

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

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

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[15] *Citizens of Goleta Valley*, 52 Cal. 3d at 564; *see also* Pub. Res. Code § 21002.1(a) ("The purpose of an environmental impact report is . . . . to identify alternatives to the project . . . .").
[16] *See* § 21100(b)(4); CEQA Guidelines § 15126.6(a).
[17] CEQA Guidelines, § 15126.6(a).
[18] CEQA Guidelines, § 15126.6(e).
[19] *San Joaquin Raptor*, 27 Cal. App. 4th at 735-38; *Kings County Farm Bureau*, 221 Cal. App. 3d at 736-37.
[20] Pub. Res. Code § 21002.
[21] Pub. Res. Code § 21002.1(b) (emphasis added).
[22] Pub. Res. Code §§ 21002, 21081(a); CEQA Guidelines, §§ 15002(a)(3), 15021(a)(2), 15091(a)(1).
[23] CEQA Guidelines § 15370.
[24] *See Save Our Peninsula Committee v. Monterey County Board of Supervisors* (2001) 87 Cal. App. 4th 99, 130.
[25] *Laurel Heights Improvement Assoc. of San Francisco v. Regents of the University of California*, 47 Cal.3d 376, 420 (Cal. 1988).

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

Thank you for the opportunity to comment on this NOP.

Sincerely,

Geoffrey G. Shester, Ph.D.
California Program Director
Oceana

Andrea Treece
Staff Attorney
Earthjustice

Anna Weinstein
Marine Program Director
Audubon California

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Susan Ashcraft
Marine Advisor
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[26] Pub. Res. C. § 2081(b)-(c).

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Gil Falcone, Environmental Scientist
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Carol Heidsiek, Permit Manager
US Army Corps of Engineers
(Carol.A.Heidsiek@usace.army.mil)

Dr. Rob Doster
U.S. Fish and Wildlife Service, Migratory Birds Division
rob_doster@fws.gov

PACIFIC FLYWAY COUNCIL

Alaska ▪ Arizona ▪ California ▪ Colorado ▪ Idaho ▪ Montana ▪ Nevada
New Mexico ▪ Oregon ▪ Utah ▪ Washington ▪ Wyoming

September 18, 2015

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

Subject: Notice of Preparation of an Environmental Impact Report for the Coast Seafoods Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project (SCH# 2015082051)

Dear Mr. Crider:

The Pacific Flyway Council (Council) would like to provide comments regarding the Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Coast Seafoods Lease Renewal and Expansion Project (Project) which includes an Initial Study (IS). The Council feels the Project, specifically the expansion of operations into an additional 622 acres of intertidal mudflat wetland habitats, will have significant negative impacts to eelgrass and species dependent upon eelgrass, specifically black brant. The DEIR should incorporate the comments provided herein.

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

There are several key reasons why Humboldt Bay is of exceptional importance to black brant and Project impacts will likely be significant:

- Black brant rely almost exclusively on eelgrass in Humboldt Bay. Eelgrass beds are only available for feeding during low tides, therefore any loss or degradation of eelgrass habitat can have a direct impact on the population using this bay;
- Black brant occur in Humboldt Bay during spring and fall migration and winter with up to 60% of the entire Pacific Flyway population staging there in spring;
- Humboldt Bay is a critically important area for black brant in the Pacific Flyway and the most utilized bay in California;

- The black brant wintering population goal in Humboldt Bay as set in the Pacific Flyway Brant Management Plan, is below the objective of 5,000 (see http://www.pacificflyway.gov/Documents/Pb_plan.pdf).
- Reliance on a single food source make black brant vulnerable to fluctuations in quality and quantity of eelgrass;
- Aquaculture impacts to eelgrass are well documented in the citations provided below;
- Black brant are highly susceptible to human disturbance and are known to avoid eelgrass beds near artificial structures and human activity;
- Increased boat traffic from aquaculture may reduce the number of black brant use-days of Humboldt Bay by increasing energy demands when boat traffic causes to birds to fly from feeding areas;
- The Project expansion will affect a total of 622 additional acres of intertidal eelgrass and mudflat areas, bringing the combined operational footprint to a total of 911 acres;
- Eelgrass habitats are in decline in California, and further loss of habitat could affect brant and other eelgrass-obligate wildlife species.
- A recent modeling study of Humboldt Bay showed that the ability of black brant to gain necessary reserves for spring migration were highly sensitive to even slight decreases (10%) in biomass of eelgrass or increases (10%) in human disturbance (Stillman et al. 2015).

The Council feels the Project would constitute a significant impact to black brant and the eelgrass habitats they depend upon. The DEIR should assess the significant impacts of disturbance to black brant and other migratory birds by quantifying the increase in the number and magnitude of disturbance events from boat traffic and human activities from the Project. The DEIR should also describe and quantify the significant impacts to eelgrass from all activities associated with the harvest, maintenance and gear placement associated with aquaculture activities. The Project will likely impact waterfowl hunting. The Council recommends that the DEIR include: 1) decreases in waterfowl available for harvest, 2) loss of hunting opportunities from disturbance of aquaculture operations, 3) loss of hunting opportunities due to physical obstruction of traditional hunting areas, and 4) increases in hazards to boaters (including skullers) and hunting dogs from aquaculture gear. Further, the Council feels the assessment of cumulative impacts in the IS was not adequately addressed given existing aquaculture, the HBHD Expansion Project, in addition to the Project. Potential cumulative impacts from the relationship between disturbance events and loss of food resources should be evaluated for black brant and other migratory birds in the DEIR.

The Council appreciates the opportunity to provide comments on the NOP and associated DEIR. The Council will maintain a strong interest in your process.

Sincerely,

Tony Wasley, Chair
Pacific Flyway Council

Cc: Pacific Flyway Council

References:

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September 21, 2015

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

Re: Comments on the Coast Seafoods Company's Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project, Final Initial Study

Dear Mr. Crider,

On behalf of the members, board, and staff of Humboldt Baykeeper, we respectfully submit these comments on the Final Initial Study for the Coast Seafoods Permit Renewal and Expansion Project, released in August 2015. These comments are supplemental to our comments on the Draft Initial Study submitted on February 26, 2015. Humboldt Baykeeper works to safeguard our coastal resources for the health, enjoyment, and economic strength of the Humboldt Bay community.

The Coast Seafoods Permit Renewal and Expansion Project proposes an expansion of commercial shellfish primarily in areas sited in dense eelgrass beds. Although the proposed culture methods are certainly less harmful to eelgrass and other resources than the bottom culture that was abandoned in 2001, long-line methods have the potential to impact the environment in a variety of ways. The Draft Environmental Import Report must provide a thorough assessment of avoidance strategies, mitigation measures, cumulative effects, and alternatives analysis.

We are particularly concerned about the proposal to develop and implement eelgrass monitoring and adaptive management as a mitigation measure to reduce impacts to eelgrass to less than significant. The importance of eelgrass has a cascading effect on various species of concern, as discussed in our previous comments. In addition, recent research suggests that eelgrass and other seagrasses

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may have a buffering effect on coastal waters where ocean acidification is causing low pH levels.[1,2] Given the negative impacts of low pH levels on oyster larvae and seed set in Puget Sound and other coastal waters, activities that decrease eelgrass abundance and/or density in North Humboldt Bay could have detrimental effects on the oyster industry as well as other shell-forming marine organisms and the species that rely on them as food sources. We strongly urge alteration of the project to avoid impacts to eelgrass due to its importance to the ecosystem as a whole, including commercial shellfish production.

We believe that the shellfish industry can be compatible with the conservation and recreation functions of the District. Whether shellfish can be sustainably produced in a larger area of Humboldt Bay will depend in large part on whether—and where—they can be grown with minimal impacts to eelgrass and other species that depend on a healthy bay ecosystem.

We appreciate the opportunity to comment on the scope of the environmental impacts assessment and alternatives analysis, and hope that your project team finds these comments helpful.

Sincerely,

___s/_____
Jennifer Kalt, Director
Humboldt Baykeeper

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[1] Samantha L. Garrard et al. 2014. Indirect effects may buffer negative responses of seagrass invertebrate communities to ocean acidification. Journal of Experimental Marine Biology and Ecology 461: 31–38.

[2] I.E. Hendricks et al. 2014. Photosynthetic activity buffers ocean acidification in seagrass meadows. Biogeosciences 11: 333–346.

Pacific Fishery Management Council
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Dorothy M. Lowman, Chair| Donald O. McIsaac, Executive Director

September 21, 2015

Adam Wagschal, Deputy Director
601 Startare Drive, Eureka, CA 95501
Telephone: (707) 443-0801
Email: awagschal@humboldtbay.org

Re: Notice of Preparation of Coast Seafoods Shellfish Aquaculture Draft Environmental Impact Report (EIR)

Dear Mr. Wagschal:

The Pacific Fishery Management Council (Council) is writing to comment on the Notice of Preparation (NOP) of Coast Seafoods Shellfish Aquaculture Draft Environmental Impact Report (EIR). On September 10th, 2015, the Council's Habitat Committee received a presentation from Robert Smith of Coast Seafoods regarding the proposed project. Given that the voluminous background materials were sent just prior to the start of the Council meeting, the Council and its advisory bodies did not have time to thoroughly review them.

The proposed draft EIR release date, at the end of September, and 45 day comment period discussed by Coast Seafoods will not allow time for the Council to comment during the official comment period. Therefore, we request that the proposed project timeline, release of the draft EIR, and comment period be adjusted so that the Council is able to comment in more detail on the current proposal during the draft EIR comment period. We are re-sending our previous comment letter, dated July 14, 2015, for consideration in case it is not possible to adjust the timeline for later Council comments. We note that changes have been made to the proposal since the July 14 letter was written which warrant further analysis.

The Council was established by the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA), and has jurisdiction over more than 119 fish species in Federal waters off Washington, Oregon, and California. The MSA charges the Council (and National Marine Fisheries Service [NMFS]) to protect the habitat these fish depend on during all stages of their life cycle, and includes provisions to identify, conserve, and enhance essential fish habitat (EFH) for those managed species. The MSA requires Federal agencies to consult with NMFS on all proposed actions that may adversely affect EFH (MSA §305(b)(2)). The Council is also authorized under the MSA to comment on and make recommendations to Federal agencies regarding EFH protection. Furthermore, for activities that the Council believes are likely to substantially affect the habitat of the salmon fishery, the Council is obligated to provide comments and recommendations (MSA §305(b)(3)).

Thank you for considering these comments during further development of the Coast Seafoods Project. We look forward to reviewing and commenting on the Draft EIR. We encourage you to contact Ms. Jennifer Gilden (Jennifer.gilden@noaa.gov) if you have any questions regarding Council timelines.

Sincerely,

Charles G. Ivancy
for

D. O. McIsaac, Ph.D.
Executive Director

Attachment: July 14, 2015 Letter to Humboldt Bay Harbor District RE: Comment on Humboldt Bay Harbor District Mariculture Project and Coast Seafoods Expansion Project

cc:

Coast Seafoods Company
25 Waterfront Drive
Eureka, CA 95501

Pacific Fishery Management Council
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Dorothy M. Lowman, Chair| Donald O. McIsaac, Executive Director

July 14, 2015

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

Re: Comment on Humboldt Bay Harbor District Mariculture Project and Coast Seafoods Expansion Project

Dear Mr. Crider:

The Pacific Fishery Management Council (Council) wishes to provide comments and recommendations on the proposed Humboldt Bay Harbor District Mariculture Pre-Permitting Project (Harbor District Mariculture Project) and the Coast Seafoods Expansion Project. We recognize that while the Humboldt Bay Harbor Recreation and Conservation District is the lead agency on both of these projects, the projects are separate and on different timelines.

The Coast Seafoods Expansion Project, which is still in the planning and analysis stage, proposes to re-permit an additional 622 acres of intertidal culture area. The project would culture the same species that Coast Seafoods currently cultures, using current methods, and would result in a total of 910 acres cultured by Coast Seafoods. We understand that the Coast Seafoods Expansion Project would use clutch-on-longlines spaced five feet apart and one foot above the bay bottom, as well as basket-on-longlines spaced five feet apart with a 20-foot row between each three lines.

As you know, the draft State Environmental Impact Report (DEIR) for the Harbor District Mariculture Project is currently being finalized. This project would create 54 new culture rafts to grow different varieties of oysters and clams on 527 acres, using three intertidal culture methods and three subtidal culture methods. Approximately 21 acres of culture would be established in subtidal areas using rafts.

The Council's meeting schedule did not enable us to provide comments during the official comment period for the DEIR for the Harbor District Mariculture Project. We understand Coast Seafoods will be preparing a DEIR for the Expansion Project, with additional public comment opportunities in the near future. We encourage you to address our concerns related to both proposed projects.

The Council was established by the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA), and has jurisdiction over more than 119 fish species in Federal waters off Washington, Oregon, and California. The MSA charges the Council (and National Marine Fisheries Service [NMFS]) to protect the habitat these fish depend on during all stages of their life cycle, and includes provisions to identify, conserve, and enhance essential fish habitat (EFH) for those managed species.

The MSA requires Federal agencies (in this case, the Army Corps of Engineers) to consult with NMFS on all proposed actions that may adversely affect EFH (MSA §305(b)(2)). The Council is also authorized under the MSA to comment on and make recommendations to Federal agencies regarding EFH protection. Furthermore, for activities that the Council believes are likely to substantially affect the habitat of the salmon fishery, the Council is obligated to provide comments and recommendations (MSA §305(b)(3)).

The estuarine habitats of Humboldt Bay are EFH for Council-managed species of salmon, groundfish, and coastal pelagic stocks. EFH includes habitats important for spawning, rearing, and feeding. Additionally, estuaries and eelgrass are designated as habitat areas of particular concern (HAPCs) for salmon and groundfish; this special designation within EFH includes habitats that are sensitive, rare, or vulnerable, and that may require additional protection. The HAPC designation requires greater scrutiny of actions that may damage these sensitive habitats.

The Council is concerned about the effects of these projects individually, and cumulatively, on EFH. In particular, we are concerned about the projects' impact on Pacific herring, an important prey species of salmon and groundfish. According to California Sea Grant, Humboldt Bay contains about 5600 acres of eelgrass, estimated to be approximately 50 percent of the state's total eelgrass. Humboldt Bay is also the third largest spawning site for Pacific herring in California, and eelgrass is the preferred substrate for spawning.

Currently, there are about 400 acres of shellfish mariculture in North Humboldt Bay. The two proposals include the continuance of 296 acres of existing mariculture by Coast Seafoods, and the cumulative expansion of aquaculture into an additional 1,149 acres of intertidal habitat, of which 952 acres are eelgrass. The proposals encompass approximately 17 percent of eelgrass in Humboldt Bay, including the most important Pacific herring spawning location in the bay, the East Bay Management Area. We are concerned that the cumulative impacts of both projects' proposed longline, rack and bag, and other culture methods on eelgrass habitat and its ecological role in the estuarine ecosystem might not be fully analyzed relative to potentially damaging effects prior to final decision-making.

Earlier research conducted in Humboldt Bay and other west coast estuaries has demonstrated that some commercial shellfish mariculture activities may result in decreased spatial cover and densities of eelgrass. The different types of mariculture growing techniques and oyster cultivation densities contribute to variability in the levels of physical and ecological disturbance to eelgrass beds and the soft-sediment estuarine habitats.

The Council agrees with and does not intend to duplicate the extensive comments that both California Department of Fish and Wildlife and NMFS provided concerning gaps in the project description and analyses in the DEIR and draft Initial Study for the Pre-Permitting Project and Expansion Project, respectively. However, we are particularly concerned that the proposed projects do not clearly demonstrate how they will strive to avoid adverse impacts on eelgrass, as is the first obligation of any permit applicant, according to both State and Federal eelgrass policies. Without avoiding damage to the greatest degree possible, there will be unnecessary impacts on EFH and, in particular, the eelgrass HAPC.

NMFS' California Eelgrass Mitigation Policy recommends no net loss of eelgrass habitat functions in California (November 7, 2014, 79 FR 66360). The Council's Pacific Coast Salmon Fishery Management Plan specifically recommends that new or expanded aquaculture farms implement 25-30

foot buffers from existing native eelgrass beds to avoid and minimize impacts to eelgrass (Appendix A, Pacific Coast Salmon Fishery Management Plan 2014:61). The Council recommends implementing the recommendations in the NMFS Eelgrass Mitigation Policy as well as the Council's salmon fishery management plan to avoid unnecessary impacts to EFH.

Shellfish habitat functions are not functionally equivalent to that of eelgrass habitat. The role of eelgrass in the food chain, including serving as spawning substrate for Pacific herring, is not replicated by cultured oysters. Shellfish do not provide the same function as eelgrass in exporting biomass into the estuarine food chain and in sequestering carbon into sediments. Shellfish filter plankton and organic matter from the water column and do not incorporate nutrients in the same way or to the same extent as eelgrass. The Council is concerned about the cumulative extent of water filtering by the mariculture operations and the loss of ecosystem services provided by eelgrass to the food web that supports our managed fishes, and thus asks that you ensure a full analysis of this issue in each DEIR.

Additionally, the impacts on managed fish from sedimentation changes under culture operations have not yet been analyzed; nor have disturbances caused by oyster culture operations (e.g., propeller wash, trampling, human disturbance) in the DEIR or draft Initial Study of the Harbor District Mariculture Project. This analysis should be included in both DEIR documents.

In summary, we ask that you ensure that these DEIRs include sufficient information and analysis that not only describes and quantifies the various potential impacts to estuarine resources, but provides mitigation measures to restore the loss of those essential habitats.

Thank you for considering these comments during further development of the Coast Seafoods Project and Harbor District Mariculture Project. We look forward to reviewing any new or pertinent studies or project modifications that would address project impacts on the EFH of Council-managed species (salmon, groundfish, and coastal pelagic species), and invite you (as the project California Environmental Quality Act lead for both projects, and as the applicant for the Harbor District Mariculture Project) to address our Habitat Committee at its September meeting in Sacramento, California, to discuss the measures you are taking to protect EFH. We plan to extend the same invitation to Coast Seafoods. We encourage you to contact Ms. Jennifer Gilden (Jennifer.gilden@noaa.gov) to arrange a presentation at the meeting.

Sincerely,

D.O. McIsaac, Ph.D.
Executive Director

JDG:kma

Cc: Council Members
Habitat Committee Members
Mr. Robert Smith, Coast Seafoods Project

State of California – Natural Resources Agency
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September 23, 2015

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

Subject: Notice of Preparation of an Environmental Impact Report for the Coast Seafoods Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project (SCH# 2015082051)

Dear Mr. Crider:

The California Department of Fish and Wildlife (Department) has reviewed the August 24, 2015 Notice of Preparation (NOP; State Clearinghouse # 2015082051) of a Draft Environmental Impact Report (DEIR) for the proposed Coast Seafoods Lease Renewal and Expansion Project (Project). The NOP also includes a revised Initial Study (IS), and a draft Eelgrass Impacts Analysis (EIA). The NOP was submitted by the Humboldt Bay Harbor, Recreation and Conservation District (HBHD) which is the lead agency. The Project proposes to continue Coast Seafoods Company's (CSF) existing operations on 294.5 acres, discontinue operations on 5.5 acres, and expand operations into an additional 622 acres of intertidal wetland habitats. The additional area consists primarily of wetland habitats, including dense eelgrass and areas of unvegetated mudflat habitat. This Project would bring the operational footprint of CSF to a total of 916.5 acres.

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

The Department reviewed the current NOP, IS and EIA and remains concerned the Project will have potentially significant impacts to Public Trust resources, including eelgrass and mudflat habitats, and species such as Pacific herring, salmon and steelhead, shorebirds and waterfowl, such as black brant and widgeon. Pursuant to our jurisdiction, the Department offers the following comments and recommendations regarding the Project.

California Endangered Species Act (CESA):
The CESA provides for the protection of rare, threatened, candidate and endangered plants and animals, and prohibits the taking of such species without authorization (Fish and Game Code Section 2050). The Department maintains a list of rare, threatened, and endangered plants and animals that can be found on the Department's web site: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/TEAnimals.pdf. The Department recommends including a full analysis of CESA listed species that may be in the Project area and potential impacts in the DEIR. Adverse impacts from the Project leading to take of CESA listed species would require take authorization from the Department according to Fish and Game Code §2081.

Biological Significance
Humboldt Bay is California's second largest bay, and the largest estuary on the Pacific coast between San Francisco Bay and Coos Bay, Oregon. The marine and estuarine habitats of Humboldt Bay provide refuge and nursery habitat for more than 300 fish and invertebrate species, many with important commercial and recreational fisheries value. Numerous sensitive species, including some listed as threatened or endangered pursuant to CESA or the federal Endangered Species Act (ESA), and California species of special concern (SSC) occur in the Project area. The Department designates certain species as SSC due to declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction. Species that occur in the Project area and are protected under the CESA or ESA, or are designated as SSC, include:

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

Humboldt Bay is an internationally important site for overwintering and seasonally migrating shorebirds (Colwell 1994; Hickey et al. 2003; Page et al. 2003). Depending on the season, up to 100,000 shorebirds reside in Humboldt Bay, with the bay listed as an Important Bird Area (IBA) by the Audubon Society and an International Site in the Western Hemisphere Shorebird Reserve Network (Schlosser and Eicher 2012). At least 24 species of shorebirds including American avocets, sandpipers, dowitchers, plovers, godwits and dunlin utilize Humboldt Bay mudflat habitats for feeding, resting and/or roosting (Danufsky and Colwell 2003; Dodd and Colwell 1998; Evans and Harris 1994; Long and Ralph 2001). Of these shorebirds, two thirds are listed as shorebirds of concern, or on the US Fish and Wildlife Service's Birds of Conservation Concern list (US Fish and Wildlife Service 2008; US Shorebird Conservation Plan Partnership 2015).

Department letter dated February 27, 2015

In January 2015, the HBHD distributed a draft IS for the Project. The Project, as proposed in the current NOP and IS, contains few changes from the Project described in the January 2015 document. The Department commented on the proposed Project in December and February 2015, in early consultation meetings, and again in a letter dated February 27, 2015 (attached). The Department's comments and recommendations identified in the February 27, 2015, comment letter remain applicable to the current Project as described in the NOP. In addition to the comments provided here, we recommend CSF fully address the comments and recommendations included in the February 27, 2015 letter from the Department in the DEIR.

Comprehensive Project Description

Several important aspects of the Project have not been fully described. This limits the Department's ability to evaluate the potential to impact trustee resources and associated wetlands. The Department recommends the project description in the DEIR include a comprehensive discussion of the following:

- a description of the planting, inspection, maintenance/repair, and harvesting schedule for intertidal basket-on-longline culture;
- a description of how gear is placed into beds, the equipment required, the frequency it is replaced, and the methods of removal;
- the size, frequency and location (mid channel, margin, in eelgrass or outside of eelgrass) of all boat anchoring, including the practice of placing boats on mudflats/eelgrass beds for the duration of the low tide;
- a detailed description of what bushel tubs are, their dimensions, and where they are used and stored; and
- a description of the use of long PVC pipes to demark aquaculture sites.

Effects to Eelgrass Habitats (Bio-B)

As described in the IS and our attached comment letter dated February 27, 2015, eelgrass provides a variety of ecological services including nursery habitat for a variety of fish and invertebrate species. Many of the species are both recreationally and commercially important. Other ecological services include: a source of food for waterfowl and invertebrates, buffering ocean acidification, nutrient cycling and absorbing nutrients, storing organic matter and carbon sequestration, stabilizing

suspended sediments and buffering shorelines from erosion, increasing light attenuation, filtering contaminants, and producing dissolved oxygen (Bjork 2008; Orth et al. 2006; Waycott et al. 2009).

The Department agrees with the conclusions of the IS that the Project may result in potentially significant impacts to eelgrass habitat that should be further evaluated in the DEIR. Under the Department's "no net loss" wetlands policy, eelgrass is protected for its habitat and habitat values. The Department remains concerned the Project could eliminate or significantly degrade existing eelgrass habitat through harvesting, maintenance and replanting activities. These activities include: trampling, anchoring of boats, placement of aquaculture gear including harvesting baskets, shading by aquaculture gear and related equipment, sedimentation, biodeposition of psuedofaeces and feces, and boat and propeller scaring. These types of impacts from aquaculture operations have been well documented in the literature (Bouchet & Sauriau 2008; Castel et al. 1989; Chandrasekara & Frid 1996; Dealteris et al. 2004; Dubois et al. 2007; Forrest & Creese 2006; Francour et al. 1999; Leguerrier et al. 2004; Milazzo et al. 2004; Nugues et al. 1996; and as reviewed in: Forrest et al. 2009; Rossi et al. 2007; Zieman 1976; and as discussed in: Milazzo et al. 2002). Additional impacts may include: reduction of floating eelgrass rafts used by larval fish and reduction of available beach wrack near the entrance to Humboldt Bay and associated species from local beaches (Castro et al. 2002; Colombini et al. 2003 and citations therein; Dempster & Kingsford 2004; Heck et al 2008; Orr et al. 2005; Thiel & Gutow 2005).

The IS does not address potentially significant impacts to eelgrass from habitat alteration and fragmentation caused by aquaculture gear. Research has found that intact natural habitats function differently, and are more resilient than altered, degraded, or fragmented habitats (Robinson et al. 1992; Harrison & Bruna 1999; Wilcove et al. 1986; Wilcox 1985). In addition, estuarine and nearshore artificial habitats have been shown to be "poor surrogates" for natural habitats, as they support different assemblages of fish and invertebrates, facilitate establishment of non-native species, and do not function or provide the equivalent ecological services provided by natural habitat (Bulleri & Chapman 2004 & 2010; Glasby et al. 2007; Moschella et al. 2005). Similarly, the addition of aquaculture gear in eelgrass habitat will alter the vertical and horizontal structure of the habitat. This modification of structure will likely attract a different composition of fish and invertebrate species, while displacing others due to changes in habitat suitability or food availability (Erbland & Ozbay 2008; Pinnix et al. 2005; Tallman & Forrester 2007). The types of impacts referenced above could directly change the habitat and species composition at the altered site, but is likely to also have impacts that extend into the adjacent "intact" habitat (Forrest & Creese 2006; Tanner 2005; Warry et al. 2009). Forrest & Creese (2006) documented that evidence of disturbance from aquaculture activities was detected at a distance of >20 meters from the perimeter of the aquaculture operations.

The Department recommends the DEIR describe and quantify potentially significant impacts to eelgrass and eelgrass habitat as referenced above. Specifically, potential impacts from placement of gear, planting, maintenance and harvesting activities,

trampling, boat routes and anchoring sites, shading, sedimentation, alteration and fragmentation, and loss of habitat and detrital food web sources from floating eelgrass rafts and beach wrack should be evaluated.

Further, the Department recommends the DEIR include a comprehensive discussion of alternatives that minimize impacts to eelgrass including the placement of all aquaculture gear outside of eelgrass areas while incorporating a buffer between eelgrass habitats and new aquaculture apparatus. Consistent with the Department's recommendations to the Fish and Game Commission for state-managed aquaculture leases, we recommend that the DEIR incorporate the 10 ft. buffer as a major avoidance and minimization measure for impacts to eelgrass.

Effects to Wetlands (Bio-C)
The IS states there will not be significant impacts to wetlands other than eelgrass. However, the proposed Project includes four acres of intertidal rack and bag culture proposed on unvegetated mudflats. The Department is concerned the proposed Project may result in significant impacts to mudflats. For example, Project impacts to existing mudflat habitat may change the composition of infauna, alter the elevation of the habitat through sedimentation and erosion, change the availability of food through a reduction or modification of prey for shorebirds and fish species, and reduce foraging areas for species such as shorebirds, bat rays, green and white sturgeon, and longfin smelt (Blackmon et al. 2006; Chigbu and Sibley 1998; Dumbauld et al. 2008; Feyrer et al. 2003; Gray et al. 1997; Hobbs et al. 2006; Kelly et al. 2007; MacGinitie 1935; Matern et al. 2000; Moyle 2002; Talent 1982).

In addition, to fully assess impacts to mudflat habitat the Department recommends the DEIR include the following:

- an evaluation of the possible impacts to mudflat habitat from changes in elevation caused by altered erosion and deposition processes;
- an assessment of possible changes to infauna composition and the subsequent impacts to shorebird and fish food resources; and
- an analysis of the reduction in foraging areas for shorebirds and fish species, such as bat rays, sturgeon and longfin smelt.

Effects to Wintering and Migrating Shorebird Populations (Bio-D1), Effects to Marine Mammals (Bio-D3), and Effects to Black Brant (Bio-D4)
The Department agrees with the IS conclusion that the Project may have potentially significant impacts to wintering and migrating shorebird populations, black brant, and marine mammals. The IS indicates these impacts will be evaluated in the DEIR. However, the Department notes the IS does not identify potential impacts from disturbance as requiring further assessment in the DEIR.

Waterfowl respond to both loud noises and rapid movements such as boats powered by outboard motors, and to visible features such as human presence. Project activities that may cause potentially significant impacts to shorebirds, waterfowl, and marine mammals from disturbance include boat traffic, and human activities associated with

shellfish culture. Schmidt (1999) documented that "small boats associated with oyster culturing activities" disturbed black brant in North Humboldt Bay. He observed these disturbances were usually caused by the first boat of the day, but that disturbed black brant did not return until late evening. Schmidt (1999) also noted that although minor individual disturbances might not illicit a disturbance response, frequent minor disturbances may cause disturbance responses in black brant.

Human disturbance to shorebirds, waterfowl, and marine mammals can include indirect disruption of normal activity patterns such as feeding, resting, roosting, or nesting (as discussed in Colwell 2010). Impacts from disturbance to shorebirds, waterfowl, and marine mammals have been well documented. Disturbances displace animals from feeding and resting areas (Lafferty 2001a & 2001b; Yasué 2005), increase energetic costs (Clausen et al. 2013; Drent et al. 2003; Korschgen et al. 1985; Schummer & Eddleman 2003; Stillman et al. 2015; Zimmer et al. 2010), and may lower productivity or reproductive success (Pfister et al. 1992; Robert & Ralph 1975). For example, migratory and wintering waterfowl generally attempt to minimize the time spent flying and maximize time spent feeding. This is especially true for black brant as eelgrass is relatively nutrient poor and is restricted by tidal access (Moore & Black 2006). As noted in Korschgen & Dahlgren (1992), flying requires considerably more energy than any other activity except egg laying. Furthermore, human disturbance can result in waterfowl changing feeding habits, losing weight, or deserting the feeding area (Korschgen & Dahlgren 1992). Persistent and repeated disturbances can preclude an animal's access to preferred feeding habitats and deplete fat reserves (Drent et al. 2003). In addition, numerous small disturbances have been shown to have a greater detrimental effect than a few large disturbances on annual mortality and population size (West et al. 2002). It has also been shown that indirect impacts also occur to non-disturbed individuals as competitor density increases in undisturbed feeding areas (West et al. 2002).

The Department recommends the DEIR assess the potentially significant impacts of disturbance to shorebirds, waterfowl, and marine mammals by quantifying the increase in the number and magnitude of disturbance events, over a range of temporal scales (e.g., day, week, month, year), from boat traffic and human activities from the Project. The analysis should incorporate published buffer distances for each species potentially impacted (e.g., Laursen et al. 2005; Borgmann 2010), the number, pathway, and duration of boat trips, and the number and location of personnel in North Bay. A model such as the one described in Stillman et al. (2015), could be used to estimate possible changes in stopover duration and weight accumulation per day due to disturbance.

In addition, the DEIR should assess potential impacts from cumulative increases in disturbance from other current and proposed bay activities, such as the HBHD Pre-Permitting Project. The proposed HBHD Project would include permitting 527 acres of intertidal habitat and 21 acres of subtidal habitat for new aquaculture operations. Intertidal operations would include cultch on longline, rack and bag, and basket on longlines. Further, potential cumulative impacts from the relationship between

disturbance events and loss of food resources, which may occur simultaneously, should be evaluated for shorebirds and waterfowl.

Effects to Pacific Herring (Bio-D2)

The Department supports the conclusion stated in the IS that the Project may cause potentially significant impacts to Pacific herring, which should be evaluated in the DEIR. Little work has focused on establishing direct linkages between nearshore habitat and herring, such as the effects of habitat on egg survivorship (Shelton et al. 2014). As noted in the Department's previous comment letter dated February 27, 2015, there is considerable uncertainty about the survivorship of herring eggs deposited on aquaculture gear relative to natural vegetated substrates. Palsson (1984) evaluated egg survivorship on several types of artificial substrate (including: polypropylene and hemp rope, polyethylene netting, tubing and turf mats, and plastic sheeting) deployed within natural eelgrass habitat. Overall, total survival and larval production was significantly lower for the artificial substrates compared to natural eelgrass spawning substrate. While the artificial substrate evaluated by Palsson (1984) was not aquaculture gear, there are some similarities. Primarily, this study serves to highlight that spawning on non-natural substrates may lead to significantly reduced survival of herring eggs through both egg loss (eggs displaced from substrate) and egg death (non-viability of eggs). The Department is concerned a large scale shift in the type of spawning substrate available to herring in the core eelgrass spawning areas of Humboldt Bay could have impacts on spawning success and negatively impact the population.

Desiccation has also been shown to be a significant cause of mortality for intertidally spawned herring eggs (Steinfield 1971; Jones 1972; Palsson 1984; Rooper et al. 1999). The static nature of longline aquaculture gear relative to tidal stage could increase exposure time of herring eggs and therefore increase desiccation compared to eggs deposited on eelgrass substrate. In addition, to the uncertainty of spawning success on aquaculture gear, the alteration of habitat structure caused by longlines may change fish community composition (Pinnix et al. 2005). This may potentially increase predation on larval and juvenile herring in important nursery habitat areas (Johnson et al. 2003). The Department recommends the DEIR include an analysis of Project impacts to Pacific herring from desiccation and increases in predation resulting from changes in fish community composition.

Effects to Black Brant (Bio-D4)

The Department concurs with the conclusion of the IS that there may be a significant impact to black brant that requires further evaluation in the DEIR. The IS describes a population shift from South Bay to North Bay during the most recent 2015 annual surveys. However, it should be noted that this trend has been observed since 2012, with as much as 76% of the black brant population observed using North Bay during some surveys (Pia Gabriel per comm. USFWS Humboldt Bay Refuge).

In addition to scientific evidence provided in the Department's comment letter dated February 27, 2015, regarding potential impacts to black brant, a recent paper by

Stillman et al. (2015), found that small changes in eelgrass abundance and disturbance can have large increases in the stopover duration and large decreases in the amount of weight black brant gain per day.

The Department recommends the DEIR include a discussion that quantifies and evaluates the following:

- the loss of eelgrass food resources and its impact on black brant;
- the potential impacts of the Project on foraging opportunities for black brant;
- the percent increase in disturbance from the Project and its potential impact on black brant;
- the cumulative impact of both a loss of food and increase in disturbance occurring at the same time; and
- the impacts from reduced food resources and increased disturbance with the potential cumulative impacts from the HBHD pre-permitting project.

Effects to Recreation (Rec-A)

Humboldt Bay is an important location for waterfowl hunting, recreational fishing, wildlife observations, and boating opportunities. The Bay provides hunting opportunities in North and South Bay for over 20 species of ducks and geese. The Department concurs with the determination in the IS that the Project may have potential impacts to recreational activities and recommends the DEIR includes analysis of Project impacts to waterfowl hunting, including:

- decreases in waterfowl available for harvest;
- the loss of hunting opportunities due to disturbance from boats and aquaculture personnel;
- the loss of hunting opportunities due to physical obstruction of traditional hunting areas and scull boat tacks; and
- increases in hazards to boaters (including skullers) and hunting dogs from aquaculture gear.

The Department also recommends the DEIR include and analysis of Project impacts to recreational fishing, wildlife observing and boating.

Effects to Salmon and Trout

The IS does not address impacts from the Project on salmon and trout species. The Department is concerned there may be potentially significant impacts to salmon and trout from the Project. Humboldt Bay and its tributaries support coho salmon, Chinook salmon, steelhead trout and sea-run coastal cutthroat trout (Gleason et al. 2004; Ricker et al. 2014; Wallace 2015). The population of federal and state listed coho salmon within the Humboldt Bay area is considered a “core” population for the SONCC ESU and has the highest “Biological Importance” score for southern coastal populations of this ESU (NMFS 2014). These populations have also been on the decline (NMFS 2014). Consequently, these populations receive significant federal and state investments to support their conservation and recovery.

Use of estuarine habitats by salmon and trout has been well documented throughout the Pacific Northwest, as well as in Humboldt Bay (Chamberlain & Barnhart 1993; CICORE unpublished data; DeGeorges 1972; Garwood et al. 2013; Gleason et. al 2004; Healey 1982; Johnson et al. 2003; Jones et al. 2014; Pinnix et al. 2013; Samuelson 1973; Thorpe 1994; Waldvogel 1977). Juvenile salmon and steelhead use eelgrass as a refuge from predators and to feed on epibenthic and epiphytic zooplankton, including copepods and amphipods that in turn feed on the bacteria from decaying eelgrass (Healey 1979; Healey 1982; Levings 1985; Thorpe 1994; Webb 1991). Eelgrass also provides habitat for sand lance, surf smelt, and Pacific herring, all of which are important food items for juvenile and adult salmon (Garwood et al. 2013; Sopher 1974).

The Project may significantly impact the salmon and trout populations of Humboldt Bay by potentially reducing and altering eelgrass habitat that provides foraging and refuge areas (Healey 1979; Healey 1982; Levings 1985). Changes in habitat structure caused by the addition of aquaculture gear may alter fish community assemblages which could increase direct predation on outmigrating smolts (Erbland & Ozbay 2008; Leitao et al. 2008; Pinnix et al. 2005; Tallman & Forrester 2007).

The Department recommends that potential significant impacts to salmonids and salmonid habitat should be evaluated in DEIR. The discussion is recommended to include the following:

- an assessment of cumulative impacts on salmon and trout species from existing operations, the Project, and the HBHD Pre-permitting project;
- an estimate of the number of salmon and trout impacted by the reduction of eelgrass and increase of predation as a result of the Project to Humboldt Bay and its tributaries; and
- an estimate of population level impacts to the four salmon and trout species.

Thresholds of Significance

The EIA states the threshold of significance proposed for the DEIR for impacts to eelgrass will be a >30% change in areal extent or a >25% change in eelgrass density at the landscape scale (100m to 10,000m). This threshold of significance does not meet the Department's definition of "no net loss" for wetland habitats. The Department recommends the DEIR include a threshold that meets the "no net loss" policy for all impacts to wetland habitats and habitat values with all impacts quantified to ensure compensatory mitigation on an acre-by-acre basis.

Compensatory Mitigation

The NOP indicates the mitigation proposed in the EIA is preliminary and will be revised. Currently, the EIA indicates the Project proposes to mitigate for unavoidable impacts by implementing one or a combination of the following: the deployment of eelgrass seed bags, creating out-of-kind salt marsh, or the restoration of upland habitat. However, the mitigation currently proposed does not meet the California Fish and Game Commission's "no net loss" policy for wetland habitats (FGC Policies as amended 2005). The policy indicates that mitigation should be in-kind on an acre for acre basis.

Specifically it states that out-of-kind mitigation is less desirable, "since it does little to provide assured benefit to those species which would be negatively impacted as a result of the development" (FGC Policies as amended 2005).

The IS and EIA do not include an estimate of eelgrass and mudflat wetland habitat acreage lost, degraded or damaged due to Project activities. Therefore, it is not possible to evaluate the adequacy of the mitigation proposed. To determine if the proposed mitigation is appropriate, the Department recommends the DEIR include a comprehensive discussion of an acre-by-acre analysis of eelgrass and mudflat wetland habitat impacted by the Project. We also recommend the DEIR include a discussion of the feasibility and timing of each mitigation alternative being proposed.

Monitoring

In addition to the avoidance, minimization and mitigation measures referenced throughout this letter, the Department recommends the development and implementation of ongoing annual monitoring sufficient to detect Project related changes and impacts to fish and wildlife resources that utilize Humboldt Bay. The Department recommends the DEIR include a discussion of a monitoring program adequate to determine Project impacts. The Department further recommends that CSF establish a multi-agency group to assist in the development of a comprehensive monitoring program. The Department would be able to participate in such a group. It should be noted that monitoring (while extremely important) does not constitute mitigation under CEQA.

Conclusion

The Department appreciates the opportunity to review and comment on the NOP, IS and the initial EIA. As always, Department personnel are available to discuss our comments, concerns, and recommendations in greater detail. For further information regarding hunting and waterfowl issues please contact Melanie Weaver, Senior Environmental Scientist, California Department of Fish and Wildlife, 1812 9th Street, Sacramento, CA 95811, phone (916) 445-3717, email Melanie.Weaver@wildlife.ca.gov; for other topics please contact Rebecca Garwood, Environmental Scientist, California Department of Fish and Wildlife, 619 2nd Street, Eureka, California, 95501, phone (707) 445-6456, and email Rebecca.Garwood@wildlife.ca.gov.

Sincerely,

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Attachment

CDFW Comment Letter. Initial Study for the Coast Seafoods Company Humboldt Bay Shellfish Culture Permit Renewal and Expansion Project. February 27, 2015.

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HUMBOLDT STATE UNIVERSITY

31 August 2015

To: Mr. Jack Crider, Executive Director
Humboldt Bay Harbor, Recreation, and Conservation District
From: Mark A. Colwell, Professor
Subject: Draft EIR for Proposed Expansion of Oyster Culture on Arcata Bay

I am writing to offer my perspectives on the Draft EIR related to the recent proposal by the Humboldt Bay Harbor, Recreation and Conservation District (and the associated plan by Coast Seafoods) to expand their areas of off-bottom oyster culture in Arcata Bay. As background, I have worked at Humboldt State University for 26+ years and my research has been focused on shorebirds, many of which rely on food (i.e., invertebrates) provided by tidal flats. My students and I have published ~17 papers (e.g., avocets, curlews, dunlin; community of shorebirds) that directly relate to the use of tidal flats by shorebirds, including one paper that evaluated the effect of off-bottom oyster culture on the presence/absence of various species of shorebird. I have also authored a textbook on *Shorebird Ecology, Conservation, and Management*, which serves as the foundation for a class that I have taught at HSU for many years.

I have read letters submitted by the various groups that oppose this projected expansion. In the context of natural resources, most of these opinions draw attention to the value of eelgrass and the fish and wildlife dependent upon this habitat. In general, I agree with these letters opposing expansion, which state that the EIR is inadequate in stating that the project will have minimum impacts on the natural resources of the bay. Rather than add to this chorus, I will confine my perspectives to the value of tidal flats and the shorebirds that rely on this habitat, a subject which appears to have been largely neglected in most letters opposing expansion. Importantly, the tidal flat habitat is where most loss and degradation of wildlife habitat will take place. However, at this point I cannot evaluate the claim that expansion of oyster culture would have "less than significant impact without mitigation" on the populations of shorebirds that use the bay (Table 12; pg. 66). To be fair, the authors of the Draft EIR have adequately reviewed the literature summarizing what is known about shorebirds and their habitats on the bay. However, the report fails to address and acknowledge what little is known about the critical ecological relationships of populations of shorebird predators and their invertebrate prey. And it is this relationship that is critical to their conclusion of "less than significant impact."

In providing the following succinct summary of my objections to the DEIR conclusion of "less than significant impact" I argue from a population perspective. That is to say, my goal is to conserve healthy populations of wildlife, in this case shorebirds. First, the DEIR presents very little information on shorebird populations using Humboldt Bay, which is rather limited in extent. This paucity of data makes all subsequent arguments about "less than significant impacts" moot because you cannot make an argument (of less than significant impact) without data. The one defensible exception to this may be the Long-billed Curlew estimate of 200-300

over-wintering on Humboldt Bay. Importantly, one of the highest quality (based on consistent use) curlew sites (Mathis et al. 2006. Western Birds 37:156-168) is one of the proposed sites for expansion (on the west shore of Indian Island).

A second problem with the DEIR, stems from the statement that "shorebirds are very flexible and opportunistic in their diets." This suggests that shorebirds can accommodate the loss and degradation of habitat (and the food resources therein) owing to oyster culture. In 1984, British authors lamented that a key unanswered question in the context of loss of estuary habitats was "if an area is totally changed, so that wildfowl and waders can no longer feed there, can they go elsewhere, or will they die? (Evans, P.R. and P.J. Dugan. 1984; *Coastal Waders and Wildfowl in Winter*. Cambridge University Press) Despite some progress (mostly in modeling), this question remains unanswered. Its understanding is, however, germane to the question of expanding oyster culture on the bay. Moreover, it seems imperative to an informed decision to proceed (or not) with the expansion. The DEIR also correctly indicates that shorebirds (and brant) use of alternative habitats (e.g., agricultural fields) at high tide and when seasonal rains increase prey availability in pastures. However, this seasonal use may be driven by the reduced availability of intertidal food in winter. The point is that we know very little about the abundance and availability of invertebrate populations that provide the essential resources to sustain wintering and migrating birds on the bay. To claim that loss and degradation of tidal flats (of whatever amount of area) would have "less than significant" impact on shorebirds and other waterbirds that rely on this habitat is, at best, premature and, at worst, a misrepresentation of current knowledge on the subject.

A third issue concerns degradation owing to the presence of humans actively working on oyster culture plots, which the DEIR identifies as a "potentially significant" impact. Table 3 details potential levels of disturbance related to the different types of oyster culture, with rack and bag methods producing a much higher potential for disturbance than other methods. The report acknowledges the potential for significant impacts but vaguely describes information conveyed in annual "educational meetings." This information is confined to marine mammals only. The impacts to shorebirds are not mentioned nor are mitigation measures addressed.

Lastly, the section on cumulative impacts misses the point. As I understand it, 7% of the bay is already in aquaculture production with unknown impacts on shorebirds. Mounting evidence indicates that, worldwide, populations of most shorebirds are in decline. Reasons for the decline are many but principal among them is the loss and degradation of habitats. Years ago, prominent ecologists (Myers et al. 1987. American Scientist 75:19-26) likened the annual cycle of shorebirds to an annual chain of events. The individual links in the chain were estuaries (like Humboldt Bay) where large numbers of individuals refueled for their next leg of their journey between arctic breeding and wintering sites that span hemispheres. The populations were vulnerable to the weakest link in the chain! Humboldt Bay is a relatively pristine estuary compared to others worldwide and it is likely a critical link in the chain for many species of shorebird because it provides essential food resources for millions of birds. Ironically, the DEIR mentions the 3.3 days in which spring migrating Western Sandpipers make use of the bay. A simple, back-of-the-napkin calculation[1] during the Spring period of peak passage of Western

[1] (maximum count of 100,000 Western Sandpipers on N. Arcata Bay tidal flats in mid-Apr)*(100% turnover of this flock 2x a week)*(3-4 week peak passage) = 800,000 Western Sandpipers alone

Sandpipers yields an estimated total population at Humboldt Bay that likely approaches a million birds – and this is for just 1 of 20+ species that are common migrants at that time of year! These sorts of numbers suggest that the value of Humboldt Bay and its tidal flats are unappreciated and certainly worthy of greater consideration in conservation decisions.

In conclusion, the stated goal of the project (Section 1.0; pg. 1) is "to allow for an expansion of commercial mariculture activities in Humboldt Bay, to create jobs and improve the local economy, while also increasing local and *sustainable* seafood production." I've italicized the word sustainable because it is key to my arguments as they relate to the conservation of shorebird populations. I interpret its use to be in the context of sustainable development as envisioned by the Brundtland Commission (1987). I think there is a lack of evidence in the DEIR that, as proposed, this project would accomplish this goal of sustainability. Consequently, I urge the Harbor District to reconsider its plan for expanding oyster culture in Humboldt Bay and consider the numerous benefits to the local economy (e.g., Godwit Days) provided by maintaining the bay in its comparatively pristine state for future generations.