Agenda Item E.1.a
Supplemental HC Report
March 2005

HABITAT COMMITTEE REPORT

The Habitat Committee (HC) met on Thursday, March 3, 2005 to develop comments on marine protected area agenda items and to discuss Klamath River issues and essential fish habitat (EFH) issues associated with oyster culture in Humboldt Bay.

The HC heard a report from National Marine Fisheries Service (NMFS) staff outlining severe water flow issues in the Klamath Basin in 2005. This will create survival problems, especially for juvenile fish, and will likely result in curtailments in fisheries when the 2005 year class returns. Similarly, the severe fishing quota restrictions expected to be enacted this year resulted in part from the very low flows of 2002 and their impacts on that year's juvenile fish. This demonstrates the need for the Council to continue to be involved in the Klamath Basin and to work toward long-term solutions, such as water banks, market rates for power and water, and other water conservation incentives. A letter on Klamath issues was postponed until the April Council meeting.

The HC also heard a report regarding a Humboldt Bay oyster culture permit application and its potential effects on EFH and Endangered Species Act-listed species. The permittee is proposing to modify an existing oyster culture operation, changing from bottom culture to off-bottom culture. Representatives from NOAA Fisheries and the permittee were present and gave the HC their differing perspectives on impacts to eelgrass and other EFH from these proposed, less disruptive modifications. This consultation is being closely followed by other West Coast shellfish growers and may have implications for other types of permits that potentially impact EFH. When NMFS completes its EFH consultation, the Council may wish to provide comments on this issue.

The HC expressed concerns about 2005 Pacific Northwest water flow issues, since snow pack is currently 20% to 40% of normal in many regions. The HC may provide a more detailed statement on this at the April meeting and may suggest recommended actions to the Council.

PFMC
03/07/05

SALMON ADVISORY SUBPANEL REPORT ON CURRENT HABITAT ISSUES

The Salmon Advisory Subpanel (SAS) is highly concerned about negative impacts to salmon stocks as a result of the imminent drought of 2005. Not only will this drought have damaging effects on returning adult salmon, but it will also negatively affect juvenile salmonid rearing and out-migration. The effects of any drought negatively affect salmon populations well beyond the year of the drought.

The SAS requests that the Council take whatever action(s) that it can to influence water regulators to manage in-stream flows released from man-made reservoirs in a manner that will most positively affect salmon passage, spawning, and juvenile salmon survival.

Water management in the Klamath River basin commences in April, therefore, the SAS requests that the Council take whatever immediate measures are possible to influence Klamath basin water mangers to provide flows that will positively affect adult salmon migration and promote juvenile salmon survival. Council action on this matter is critical, due to the timing of the water management year in this important river basin.

The SAS will forego other habitat comments until the April meeting when they are more defined.

PFMC
03/08/05

Agenda Item E.1
Attachment 2
March 2005

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802- 4213

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Lieutenant Colonel Michael McCormick
District Engineer
U.S. Army Corps of Engineers
Regulatory Branch
333 Market Street
San Francisco, California 94105-2197

Dear Colonel McCormick:

The National Marine Fisheries Service (NOAA Fisheries) has reviewed the Army Corps of Engineer's (ACOE) Public Notice # 26912N regarding Coast Seafoods Company's (Coast) proposed project to conduct the planting, grow out, and harvest of Pacific and Kumo oysters on approximately 300 acres of Humboldt Bay tidelands. The proposed project is located in an area that has been identified as Essential Fish Habitat (EFH) for fish species included in the Coastal Pelagics, Pacific Groundfish, and Pacific Salmon Fishery Management Plans (FMPs), as defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA).

NOAA Fisheries offers the following comments pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). This response does not relieve the Corps of its obligations to comply with the procedures set forth in the Endangered Species Act, as amended (16 U.S.C. 1531 et seq) or the substantive requirements of Section 7(a), as well as determination of effects on Essential Fish Habitat (EFH), pursuant to Section 305(b)(2) of the MSFCMA.

The Project Description states that Coast proposes to convert its mariculture operations in Humboldt Bay from bottom culture of oysters (harvesting oysters with hydraulic dredge and a modified dragline type dredge) to off-bottom methods of stake (long-line devices, primarily Poly Vinyl Chloride (PVC) pipe-stakes and rope) and rack-and-bag culture. In addition, Coast states it would reduce its operational footprint in Humboldt Bay from a maximum of 500 acres during any given crop cycle to 300 acres within any given crop cycle. Since most of this conversion (500 acres of bottom culture to 300 acres of off-bottom culture), as well as Coast's oyster mariculture operations, has already taken place or is currently taking place without an ACOE permit, Coast is asking for "after-the-fact" authorization for the conversion and continued operations. Coast proposes to conduct planting, grow out, and harvest of Pacific and Kumo oysters on approximately 300 acres

of Humboldt Bay tidelands in any given crop cycle. Although Coast owns 560.9 acres of Humboldt Bay tidelands, and leases another 3,384.5 acres from local entities (Humboldt Bay Harbor, Recreation and Conservation District and City of Arcata) on Arcata Bay (North Humboldt Bay), Coast states that oyster culture will occur only in areas previously subject to oyster culture.

In an effort to consolidate all of Coast's mariculture and operational actions under one ACOE permit, clam raft culture and maintenance dredging adjacent to Coast's loading dock are also included in the Public Notice. NOAA Fisheries recommends that these activities be conducted under a separate permit because they are currently too vaguely defined in the Public Notice. NOAA Fisheries understands that these activities are related to mariculture operations and that Coast may wish to have all of their operations covered in one permit. However, the activities need to be clearly defined in order for a permit, individual or Nationwide, to be issued. The proposed action, a description of the action area, and effects of the proposed action need to be clearly stated. This includes but is not limited to: extent of area and amount of material to be dredged; location of disposal area; method, timing, duration, and frequency of dredging; toxicity of sediments, if any; and proximity and extent of eelgrass beds.

Regarding the remaining project components of the proposed action (i.e. long-line culture, rack-and-bag culture, nursery areas, wet storage floats and FLUPSY), NOAA Fisheries recommends denial of the permit for the project as currently proposed for the following reasons:

1) Adverse impacts to eelgrass habitat

2) Impacts to primary productivity not addressed

3) Impacts on water circulation and sediment dynamics not addressed

4) Inadequate mitigation measures

Each of these reasons is elaborated further in the following sections. Although currently opposed to the authorization of a permit for the proposed project, NOAA Fisheries believes that approval of a revised project is possible, if appropriate measures and conditions are incorporated into the permit.

Adverse Impacts to Eelgrass Habitat

As indicated in the Public Notice, many of Coast's mariculture operations overlap with seagrass habitat (specifically eelgrass, *Zostera marina*). Seagrass has long been recognized as an extremely valuable habitat in the marine and estuarine environment (Zieman, 1982; Thayer and Phillips, 1977; Thayer et al., 1984; Hoffman, 1986; Phillips, 1984; and Fonseca et al., 1998). In fact, seagrass has been documented as one of the most productive ecosystems in the world (Zieman and Wetzel, 1980; Merkel, 1991). Seagrasses are particularly important in estuarine primary productivity (Zieman and

Wetzel, 1980), nutrient regeneration (Klug, 1980), sediment stabilization (Fonseca, 1996), and as habitat for many fish and marine invertebrates (Orth and Heck, 1980; Hoffman, 1986; and Phillips, 1984).

Despite the obvious value of seagrasses, over 90,000 hectares of seagrass loss has been documented throughout the world over the last decade (Short and Wyllie-Echeverria, 1996). Although natural events have been responsible for some of these losses, human-induced disturbances are considered to be most responsible. In order to address these widespread impacts, regulatory authorities have adopted various policies which reduce the impacts to this sensitive and valuable habitat. As stated in the Public Notice, the Environmental Protection Agency (EPA) has designated vegetated shallows (i.e., seagrasses) as Special Aquatic Sites. This status provides special consideration when evaluating permits for dredged or fill material pursuant to Section 404 of the Clean Water Act. Although policy provisions such as this have slowed habitat losses, a decline in seagrasses continues at a gradual but steady rate (Merkel, 1991).

In response to these negative trends in seagrass and other important fishery habitat, NOAA Fisheries Southwest Region (SWR) has developed two policies. First, according to NOAA Fisheries SWR Habitat Protection Policy (HPP), NOAA Fisheries will not recommend approval or authorization of any project that will damage any existing or potentially restorable habitat and associated marine, estuarine, or anadromous resources. Under certain situations, NOAA Fisheries would approve habitat/resource damages to be compensated for through various mitigation strategies. However, NOAA Fisheries only approves compensation when the project incorporates all feasible modifications and construction techniques to minimize adverse environmental impacts. For projects that have the potential to impact eelgrass, NOAA Fisheries SWR, in cooperation with U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG), developed the Southern California Eelgrass Mitigation Policy (SCEMP) to provide further guidance on the necessary steps an applicant must take to compensate for unavoidable impacts to eelgrass resources. Given that Humboldt Bay has the largest stand of eelgrass and is one of the least impacted major estuaries in California, it is essential that the relevant regulatory and resource agencies properly manage this resource.

The Public Notice identifies potential impacts to eelgrass distribution and density from Coast's activities. Previously, during Coast's permit application process to the Humboldt Bay Harbor, Recreation and Conservation District (HBHRCD), a Mitigated Negative Declaration was developed, which also identified potentially significant environmental effects on eelgrass. In order to address this potential impact, Coast Seafoods was required to cooperate with the Western Regional Aquaculture Center (WRAC) in conducting a four-year study of the effects of mariculture on eelgrass and associated biota. In WRAC's most recent report, Rumrill and Poulton (2003) observed a strong trend of decreasing eelgrass spatial cover and density with decreasing distance between oyster long-lines. Specifically, for the 2.5 foot long-line spacing that Coast is currently proposing to utilize, Rumrill and Poulton (2003) observed an average spatial cover of 4.5 percent and an average density of 10.3 shoots/m^2 compared to an eelgrass control site which reached up to 70 percent spatial cover and 62 shoots/m^2. Results from this study

also indicate that the presence of dense oyster lines (1.5, 2.5, and 5-ft line spacing) generally results in reduced eelgrass blade length and biomass.

In another oyster mariculture-related study conducted in the South Slough Estuary, Oregon, Everett et al. (1995) found that rack culture had a significant negative effect on eelgrass cover and shoot density. After 18 months of rack culture, eelgrass was absent from the interior of the rack plots. A halo of low shoot density was also found around the rack culture, while the surrounding areas remained a dense eelgrass bed. In addition, after 10 months of stake culture, eelgrass shoot densities were significantly lower in culture plots than in reference plots. These impacts were presumably due to changes in the local hydrological conditions, which also had coincidental effects on local sediment deposition. Everett et al. (1995) also determined that the intensive localized activity of workers placing oyster mariculture structures in the substrate was a probable cause for initial temporary low eelgrass cover. In order to better understand the disturbance effects associated with structure placement, maintenance, and harvesting, the proposed action should include a better description of the crop cycle. More specifically, the crop cycle needs to be defined (number of days and Julian dates of typical planting, harvest, etc.) for each type of culture, as well as the frequency and timing of actions prior to harvest in order to determine how many times the areas associated with the stake and rack-and-bag culture are disturbed by walking or other actions associated with mariculture. Assignment of Julian date to actions will permit linking with other seasonal physical factors, such as tides, rainfall, wind, and light levels. Other studies have also indicated that oyster culture negatively affects eelgrass density and percent cover (see Griffin, 1997, for brief review).

Another potential mechanism for impacts to eelgrass and other benthic habitats may result from bio-deposition. Oysters (8-10cm) can produce up to 120g of feces in dry weight in a given year. Some of the feces will be decomposed into dissolved matter and carried away from the culture site, but most will accumulate under the suspension culture, which may change the textural composition of the benthos. In turn, these textural changes in the seabed have impacts on the benthic species assemblages. Comparisons by Tang and Fang (2002) of historic vegetation and invertebrate biomass compared to present levels under suspended culture show dramatic declines. Accumulation of bio-sediment from intensive suspending culture is presumably one of the most important factors leading to the decline of eelgrass along portions of China's coastline (Tang and Fang, 2002).

Reductions in density and/or coverage of eelgrass habitat from mariculture activities could result in concomitant losses in associated ecological functions. Of particular concern to NOAA Fisheries are potential reductions in the quantity and quality of habitat available for fish species managed under the Coastal Pelagics, Pacific Groundfish, and Pacific Salmon FMPs and their prey items. Based upon the Barnhardt et al. (1992) report, the following Federally managed species have been documented to occur in Humboldt Bay: leopard shark (*Triakis semifasciata*), soupfin shark (*Galeorhinus zyopterus*), spiny dogfish (*Squalus acanthius*), big skate (*Raja binoculata*), lingcod (*Ophidon elongatus*), cabezon (*Scorpaenichthys marmoratus*), kelp greenling

(*Hexagrammos decagrammus*), black rockfish (*Sebastes melanops*), blue rockfish (*Sebastes mystinus*), bocaccio (*Sebastes paucispinis*), brown rockfish (*Sebastes auriculatus*), copper rockfish (*Sebastes caurinus*), grass rockfish (*Sebastes rastrelliger*), vermillion rockfish (*Sebastes miniatus*), yellowtail rockfish (*Sebastes flavidus*), butter sole (*Isopsetta isolepis*), Dover sole (*Microstomus pacificus*), English sole (*Parophrys vetulus*), Pacific sanddab (*Citharichthys sordidus*), sand sole (*Psettichthys melanostrictus*), starry flounder (*Platichthys stellatus*), northern anchovy (*Engraulis mordax*), coho salmon (*Oncorhynchus kisutch*), and chinook salmon (*Oncorhynchus tshawytscha*). Of these, English sole, copper rockfish, and rockfish larvae/juveniles are considered 'resident' users of eelgrass beds and black rockfish, kelp greenling, lingcod, cabezon, butter sole, Dover sole, sand sole, starry flounder, northern anchovy, chinook salmon, coho salmon, and spiny dogfish are considered 'transient' users, as described in Phillips' (1984) description of eelgrass meadows in the Pacific Northwest.

Multiple studies have demonstrated higher faunal densities within seagrass habitat compared to unvegetated sand or mud substrates (Hoffman, 1986; Orth et al., 1984; Lazzari, 2002). More recently, studies have shown that the structural complexity of seagrass meadows has the greatest influence on faunal densities. Wyda et al. (2002) demonstrated a significantly higher abundance, biomass, and species richness of fish assemblages within sites that have high levels of eelgrass habitat complexity compared to sites with reduced eelgrass complexity or sites without any eelgrass. Similarly, Hovel et al. (2002) found that seagrass shoot biomass had a significant influence on species' densities. As described earlier, research has demonstrated that oyster aquaculture generally causes a reduction in the structural complexity of eelgrass beds via decreases in shoot density and percent cover. Thus, Coast's activities may result in reduced abundance, biomass, and/or species richness within aquaculture areas that overlap with eelgrass habitat.

In addition to the physical structure of seagrasses, the structural complexity and food resources provided by epiphytes are an important factor in faunal utilization. For instance, caprellid amphipods, which are attached to eelgrass blades, are a major source of food for shiner perch (*Cymatogaster aggregata*). Another unique component of eelgrass epiphyte assemblages in the Pacific Northwest are harpacticoid copepods, which serve as important prey items of juvenile salmon (*Oncorhyncus* spp), Pacific herring (*Clupea harengus pallasi*), Pacific sand lance (*Ammodytes hexapterus*) and surf smelt (*Hypomesus pretiosus*) (Simenstad, 1994). Thus, habitat modification by oyster mariculture can reduce the number of prey items for various predatory fish, thus leading to a potential reduction in the carrying capacity of these predators (Simenstad and Fresh, 1995).

In light of the fact that certain coastal fish assemblages have been in severe decline, evidenced by the most recent Pacific coast groundfish stock assessments and the Pacific Fishery Management Council's subsequent Pacific Groundfish closure, sensitive nursery habitats should be a priority for conservation and protection. Love et al. (2002) identified seagrass beds, in addition to kelp beds and rock outcrops, as essential habitat for young rockfishes (*Sebastes* spp.) by providing an important nursery function. In addition,

Moore et al. (2000) determined that eelgrass supported high biodiversity and provided important habitat for juvenile rockfish and other fish species. As noted in Love et al. (2002), "Loss or alteration of these nursery habitats, which are already limited in abundance, could have long-lasting detrimental consequences to the survival of rockfishes and the replenishment of their populations."

In addition to potential impacts to eelgrass directly utilized as habitat by Federally managed fish species, there are a number of ecosystem-level impacts that could indirectly affect Federally managed fish species. For instance, impacts to the detrital-based food web associated with eelgrass beds could disrupt linkages between organisms within other habitats of the estuary and coastal nearshore habitats. Prolonged disturbances to the eelgrass community can also lead to marked shifts in community structure. For instance, persistent disturbance of eelgrass by oyster aquaculture activities in Willapa Bay may have promoted the expansion of burrowing shrimp (Simenstad and Fresh, 1995). Once the burrowing shrimp become established in an area, they may inhibit future eelgrass colonization (Harrison, 1987).

Impacts to Primary Productivity Not Addressed

The effect of shellfish culture on natural ecosystem processes has not been examined in the Pacific Northwest. Simenstad and Fresh (1995) suggest estuarine management would benefit by considering aquaculture (and its effects) as a disturbance factor to be compared with other natural disturbances in the ecosystem. However, an ecosystem approach has been used in France, China, and the Netherlands (Smaal et al., 2001; Leguerrier et al., 2003; Grant and Bacher, 2001) through the application of an exploitation carrying capacity concept for an estuary with shellfish culture. The exploitation capacity of ecosystems depends on the availability of food, in this case primary production in the form of phytoplankton and microphytobenthos, and the number of competitors, and reflects a balance between particle depletion and renewal (Grant and Bacher, 2001; Smaal et al., 2001). Smaal et al. (2001) further defines the exploitation carrying capacity as the stock size at which the maximum marketable cohort is achieved. Within an estuary, primary production is not an unlimited natural resource (Fontenelle, 2003). Leguerrier et al. (2003) modeled a coupled pelagic-benthic food web of an intertidal mudflat ecosystem in France to estimate annual average carbon flows between compartments which are often linked by physical processes such as sedimentation and resuspension. Inputs of carbon in this food web are primary productivity (phytoplanktonic and microphytobenthic) and the suspended detritus supplied from tributaries, wetlands and redistributed by tidal currents. Exports of carbon included respiratory losses, material exports and burial. Material export occurs in the form of secondary production or biomass (harvested oysters, fish, birds), unused primary production, and detrital export and secondary production.

In a mesocosm study conducted at the Marine Ecosystem Research Laboratory near Narragansett Bay, oysters affected phytoplankton species composition and increased rates of sedimentation (Pietros and Rice, 2003). Similar results were found in the Thau lagoon, where food consumption by oysters modified food concentrations and primary

production (Gangnery et al., 2001). Changes in phytoplankton abundance and diversity will influence the marine ecosystem by restraining secondary production, which in turn will affect fisheries resources. Smaal et al. (2001) demonstrated that under certain circumstances, shellfish culture of mussels can be exploited at maximum capacity. If this were to happen, intensive bivalve mariculture may decrease the quantity of phytoplankton to such an extent that primary production decreases. Without sufficient phytoplankton in the coastal seawater, the growth and reproduction of zooplankton and other herbivorous marine animals will be affected, which can lead to changes in the ecosystem (Tang and Fang, 2002).

Oyster mariculture (growth and subsequent harvest) in Humboldt Bay removes carbon from the ecosystem and alters the natural carbon cycle. Coast has not indicated how many oysters and clams are placed in Humboldt Bay, either in past bottom culture or current oyster culture. Information on both the number and duration of oysters and clams placed in the various culture areas will be needed so that the effect of both the filter feeding of the organisms, as well as the physical effect of the organisms and their structural supports (long-lines; rack-and-bag; nursery pallets; Flupsy; clam rafts) on both abiotic and biotic ecosystem processes in Humboldt Bay can be estimated. Coast does not address the impact of oyster and clam mariculture on the primary productivity (phytoplankton and microphytobenthos, and epiphytic production on eelgrass), and more importantly carbon cycling, within Humboldt Bay. The applicant states that oyster mariculture has a positive effect on the overall water quality of Humboldt Bay (oysters are filter-feeding animals and require nearly pollution-free and high standards of water quality for optimum oyster growth). Water quality has a number of interpretations, depending on one's framework of thought. This statement reflects the economic aspect of the business relative to the ecosystem they are exploiting, and is more clearly stated in the following two sentences. In order for optimal growth of (filter-feeding animals) oysters, an abundant supply of phytoplankton is required. In order for oysters to be sold commercially, they must be free from contaminants or harmful bacteria. Filtration effects differ depending upon the location of the oysters in the water column. For instance, Ruesink et al. (2003) demonstrated that off-bottom culture filters a different component of the primary production in the ecosystem than oysters cultured on the bottom and may decrease food availability for other suspension feeding species in Humboldt Bay.

Impacts on Water Circulation and Sediment Dynamics Not Addressed

The physical effects caused by drag and/or roughness of the long-line and rack-and-bag culture on water circulation and sediment dynamics in Humboldt Bay have not been acknowledged, examined or mitigated for in the proposed action. Off-bottom oyster culture has the potential to affect water circulation within Arcata Bay at a small (less than 1 m) as well as at larger scales (e.g., 10-100 m). Grant and Bacher (2001) identified the frictional effects of aquaculture on water and particle flux as one of the most neglected areas of study in culture systems. They used a suspended bivalve (scallop) and kelp culture in a two-dimensional finite simulation model of circulation in Sungo Bay, China to predict effects of culture on tidal current speed and flow pattern and implication for carrying capacity estimates as related to food delivery by local flow. Model output

indicated suspended aquaculture resulted in a 20 percent reduction in current speed in the main navigation channel and a 54 percent reduction in speed in the midst of the culture area. In addition, mussel rope culture (similar to oyster long-lines) with spacings of 60 cm (23.6 in) were found to drastically reduce current flow (Saxby, 2002).

Historically, oyster harvesting practices have caused a change in sediment distribution (Barnhart et al., 1992). If these changes continue, it could impact fish and invertebrate species whose distribution is regulated by sediment characteristics. For instance, English sole, an important Federally managed commercial species that almost exclusively utilize estuarine areas for nursery habitat, appear to consistently be found in sediments composed of medium sand (500 μm to 1 mm) or very fine sand (250 μm to 500 μm) (Rooper et al., 2003).

Mitigation Measures Inadequate

The majority of the mitigation measures proposed by Coast in the Public Notice are measures already imposed upon them through HBHRCD's permit and the California Environmental Quality Act (CEQA) process. The HBHRCD produced a Mitigated Negative Declaration (MND) pursuant to CEQA for the Coast's mariculture operations in 1999. In this document, the HBHRCD claimed there was not enough available information to accurately identify potential impacts or effective mitigation measures. Therefore, they developed a program that identified a number of study projects that they believed would provide the necessary information to determine the level of impacts and the most appropriate mitigation measures. The bulk of the research associated with potential impacts to eelgrass was coordinated and funded through the Western Regional Aquaculture Center (WRAC). Specifically, the WRAC funded a study by academic and agency researchers from Washington and Oregon who are investigating the effects of oyster mariculture on estuarine ecosystems. The main goals of this investigation are: 1) compare the species diversity, density, and biomass of infaunal and epifaunal macro-invertebrates among oyster cultivation plots in Humboldt Bay and representative control areas; 2) conduct field experiments to directly examine the ecological impacts of Coast's oyster bottom culture and long-line operations on eelgrass and their associated infaunal and epifaunal communities; and 3) assess the relative capacity of Coast's oyster cultivation areas and control areas to serve as habitat and forage areas for various fish and invertebrates such as juvenile salmon and Dungeness crabs.

Many of the proposed mitigation measures are studies addressing marine impacts or characterizations of the study area. NOAA Fisheries supports these studies and characterizations in concept, but has questions and concerns about some of the proposed measures. First, it is unclear why some of the measures are considered 'mitigation' measures. For instance, Coast proposes as mitigation to provide: 1) maps depicting the details of their operational footprint; 2) results from the WRAC study of the impacts of long-line culture on eelgrass; 3) results from the WRAC study on substrate elevation changes; and 4) funds towards an ongoing fishery utilization study. These measures provide information regarding project operations and their impacts, which are examples

of the types of information necessary for developing mitigation, but do not provide mitigation by themselves.

Secondly, NOAA Fisheries is concerned that the ongoing studies will not provide the information necessary for a comprehensive mitigation plan. For instance, the WRAC study, which analyzes the impacts of long-line culture on eelgrass, is hindered by a pseudo-replicated experimental design. Although various statistical techniques may be utilized to differentiate relative impacts between treatments with confidence, NOAA Fisheries does not believe the current study will be capable of predicting absolute impacts associated with each treatment. Thus, there will be no reliable, quantitative estimate of the actual impact associated with long-line culture. However, on the positive side, the study may provide information useful for establishing future best management practices (BMPs), such as the appropriate line spacing for minimizing impacts to eelgrass. In fact, when discussing how to communicate results of this project to growers and managers, Dumbauld (2002), the WRAC work group chair, wrote: "Our primary goal is not to communicate "impacts" of aquaculture, but to provide a range of options for estuarine management." This was also opined in the HBHRCD's MND: "The WRAC studies are anticipated to produce 'best management practices' for oyster mariculture that will be applicable in other west coast estuaries having ecologies similar to that of Humboldt Bay."

Third, as discussed in the previous sections, many of the impacts associated with Coast's proposed activities are either not well quantified or not addressed. Specifically, there are no reliable, quantifiable estimates of Coast's impacts to eelgrass and fishery resources. In addition, impacts to primary production, water circulation, and sediment dynamics are not adequately addressed. Therefore, it is unclear how Coast developed the mitigation measure involving the transfer of 50 acres of tidelands and cessation of activities on the remainder of their owned and leased tidelands. Coast presents no scientific justification for how this measure compensates for impacts. In order to develop a more defensible mitigation plan, Coast needs to better quantify the impacts to eelgrass, fishery resources, primary productivity, sediment dynamics, and water circulation. In addition, the habitat value of the oysters and their associated structures should be determined. Any positive benefits associated with Coast's operations should be considered for incorporation into the final mitigation plan.

Conclusion

Based upon existing knowledge of oyster aquaculture impacts in Humboldt Bay and impacts of similar operations in other regions, NOAA Fisheries believes the proposed project will have an adverse impact on EFH. In addition, NOAA Fisheries believes many of the impacts are not adequately addressed. Lastly, there is no evidence that the proposed mitigation measures will compensate for Coast's environmental impacts. Therefore, NOAA Fisheries recommends denial of the project as currently proposed. However, NOAA Fisheries is eager to work with Coast, ACOE, California Department of Fish and Game (CDFG), U.S. Department of Fish and Wildlife (USFWS), California Coastal Commission (CCC) and other relevant state agencies and interested parties to

develop measures that would adequately safeguard the environment while also promoting an environmentally sound oyster mariculture operation. In order to facilitate the development of a project that would satisfy our concerns, NOAA Fisheries requests an expanded EFH consultation with ACOE and intends to provide EFH Conservation Recommendations after receiving an EFH Assessment, as described in 50 CFR Part 600 §600.920 and §600.925.

Thank you for considering our comments. If you have any questions, please contact Bryant Chesney at (562) 980-4037 or Bryant.Chesney@noaa.gov or Diane Ashton at (707) 825-5185 or Diane.Ashton@noaa.gov.

Sincerely,

Valerie L. Chambers
Assistant Regional Administrator
for Habitat Conservation

Enclosure (References)

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

JAN 27 2005

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Lieutenant Colonel Philip T. Feir
Department of Army
San Francisco District, Army Corps of Engineers
333 Market Street
San Francisco, California 94105-2197

Dear Colonel Feir:

This letter acknowledges the National Oceanic and Atmospheric Administration's National Marine Fisheries Service's (NOAA Fisheries) receipt on December 20, 2004, of the U.S. Army Corps of Engineers (Corps) December 16, 2004, letter requesting initiation of consultation under section 7 of the Endangered Species Act (ESA) and for actions that may adversely affect essential fish habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). These consultations concern the possible effects of your proposed permitting of Coast Seafoods' aquaculture operations in Humboldt Bay, Humboldt County, California. In the December 16, 2004, letter, the Corps included the following language to "serve as the basis" for the proposed ESA consultation:

> [Coast Seafoods] Coast proposes to complete conversion of an additional 45 acres of its mariculture operations in Humboldt Bay. Currently, Coast has completed conversion of 255 acres of its mariculture operations from historic bottom culture of oysters (i.e., harvesting oysters with hydraulic dredge and a modified dragline-type dredge) to its current off-bottom methods of mariculture using long-line devices (primarily PVC pipe-stakes and rope) and rack-and-bag apparatus in navigable waters of the United States. The existing and proposed actions of Coast would include the planting, grow out (i.e., growth of oyster culture), and harvest of Pacific and Kumo oysters on approximately 300 acres of Humboldt bay tidelands at a given crop cycle through off-bottom culture methods using long-line devices (primarily PVC pipe-stakes and ropes) and rack-and-bag apparatus.

The "existing actions" described by the Corps in its December 16 letter refer to Coast Seafoods' current and continuing off-bottom planting, grow out, and harvesting of oysters on 255 acres in Humboldt Bay, and the "proposed actions" refer to future off-bottom planting, grow out, and harvesting of oysters on an additional 45 acres. The Corps also requested in its December 16 letter that:

> [T]he Service [NOAA Fisheries] proceed with consultation and to prepare an ESA biological opinion and an essential fish habitat consultation report for the project within 135 days of receipt of this letter to conclude the consultation process. Of course, if your review of the administrative record should lead you to conclude that all requirements of the ESA can be

satisfied with ESA informal consultation rather than ESA formal consultation, please so inform the Corps.

Based on our review of the proposed action to permit the continued and future expanded operations of Coast Seafoods, Inc. on 300 acres in Humboldt Bay, California, as well as the information that the Corps submitted with its December 16, 2004, letter, NOAA Fisheries agrees with the Corps' finding that the action warrants formal consultation under the ESA and also consultation under the MSA for EFH. NOAA Fisheries finds the likelihood of adverse effects is sufficient to proceed with development of a biological opinion and an EFH consultation. Although available information suggests long-line structures can result in a variety of beneficial effects, the potential adverse effects to eelgrass beds in areas designated as critical habitat are more than "discountable or insignificant", which are thresholds that trigger a likely to adversely effect critical habitat determination under the ESA (U.S. Fish and Wildlife Service and National Marine Fisheries Service Consultation Handbook, 1998). In a similar manner, potential adverse effects to eelgrass and other habitats identified and described as EFH would trigger a may adversely effect determination under the MSA (Sec. 305). Thus, NOAA Fisheries does not concur with the findings of the biological assessment regarding the likelihood of adverse effects to Southern Oregon/Northern California Coast (SONCC) coho salmon critical habitat and regarding adverse effects to EFH, and NOAA Fisheries will prepare a biological opinion and EFH consultation on the proposed action. The biological opinion will analyze any beneficial, as well as adverse, impacts from the action on Northern California (NC) steelhead, California Coastal (CC) Chinook salmon and SONCC coho salmon and also designated critical habitat for SONCC coho salmon. The EFH consultation will analyze impacts to EFH for Pacific salmon, groundfish, and coastal pelagics. NOAA Fisheries intends to integrate the formal ESA section 7 consultation and EFH consultation, including providing consultation documents in the time frames prescribed for formal ESA section 7 consultation.

Due to a recent proposal to designate critical habitat for NC steelhead and CC Chinook salmon, NOAA Fisheries recommends that the Corps, in accordance with 50 CFR § 402.10, request a conference opinion on proposed critical habitat. Conferencing on the proposed action now will avoid the need for reinitiation of consultation once the designation of critical habitat takes effect this summer.

NOAA Fisheries finds that adequate information has been provided to initiate formal ESA section 7 consultation and EFH consultation and we are hopeful that initiation of consultation will expedite the consultation process. However, NOAA Fisheries believes additional information will be needed to complete the consultation. For instance, we request that the Corps clarify the duration of the proposed permit. Other information needs will be identified during consultation.

NOAA Fisheries intends to communicate with the Corps and the applicant to assist in answering technical questions that may arise and intends to provide the Corps with preliminary draft consultation documents as they become available. If you have any questions concerning this letter, or these consultations, please contact Ms. Irma Lagomarsino at (707) 825-5160.

Sincerely,

Rodney R McInnis

Rodney R. McInnis
Regional Administrator

Agenda Item E.1
Situation Summary
March 2005

CURRENT HABITAT ISSUES

The Habitat Committee (HC) will meet on Thursday, March 3, 2005, to develop recommendations on the following Council agenda items:

H1. Federal Waters Portion of the Channel Islands National Marine Sanctuary (NMS)
H2. Cordell Bank NMS
H3. Monterey Bay NMS
B.3 Council Operating Procedures: Adopt Final

In addition, the HC will discuss issues associated with oyster culture in Humboldt Bay, and current flow conditions in the Klamath Basin. A proposed letter concerning Klamath River flows is attached.

The HC's complete agenda is attached.

Council Action:

Consider comments and recommendations developed by the HC at the March meeting.

Reference Materials:

1. Agenda Item E.1, Supplemental Attachment 1: Proposed letter on Klamath flows.
2. Agenda Item E.1, Attachment 2: November 2003 letter from NMFS Southwest Region to U.S. Army Corps of Engineers concerning proposed Humboldt Bay oyster project.
3. Agenda Item E.1, Attachment 3: January 2005 letter from NMFS Southwest Region to U.S. Army Corps of Engineers concerning proposed Humboldt Bay oyster project.

Agenda Order:

a. Report of the Habitat Committee — Stuart Ellis
b. Reports and Comments of Advisory Bodies
c. Public Comment
d. **Council Action:** Consider HC Recommendations

PFMC
02/22/05