Pacific Fishery Management Council

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Dr. Scott M. Rumsey
Acting Regional Administrator
NOAA Fisheries West Coast Region
1201 NE Lloyd Blvd #1100
Portland, OR 97232

RE: Notice of Intent to Prepare a Programmatic Environmental Impact Statement for Identification of One or More Aquaculture Opportunity Area(s) in Southern California

Dear Dr. Rumsey,

The Pacific Fishery Management Council (Council) submits the following comments in response to the National Oceanic and Atmospheric Administration (NOAA) Notice of Intent (NOI) to prepare a Programmatic Environmental Impact Statement (PEIS) on the Southern California Aquaculture Opportunity Areas (AOAs).

The Council is one of eight Regional Fishery Management Councils established by the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA). The Council is charged with sustainably managing West Coast fisheries and the habitats upon which they depend and develops fisheries management actions for Federal fisheries of Washington, Oregon, California, and Idaho. The Council is required to achieve optimum yield for public trust marine fishery resources, which requires sustainably managing these resources, their habitats, and the fishing communities that rely on their harvest.

The Council very much appreciates the approach NOAA is taking in this planning initiative and supports the programmatic approach to environmental impact analysis. We understand the resulting Draft PEIS will address an initial programmatic decision and analysis and establishes a tiering process for subsequent decisions to be made that are supported, in part, by the analysis detailed in the PEIS. Seeking stakeholder engagement before siting decisions are made will allow the public to have confidence that their voice is heard as the process unfolds, which will support an informed decision-making process, consider a reasonable range of alternatives, and review the environmental impacts of the Proposed Action.

Council Authorities and Responsibilities

Essential Fish Habitat

The Council is particularly focused on actions that may adversely affect the essential fish habitat (EFH) of Council-managed species. The MSA requires the identification, conservation, and enhancement of EFH for species managed under the Council's fishery management plans (FMPs). The MSA authorizes the Council to comment on actions that may affect the habitat, including

EFH, of a fishery resource under its authority (Section 305(b)(3)(A)) and requires the Council to comment on actions that are likely to substantially affect the habitat of an anadromous fishery resource under its authority (Section 305(b)(3)(B)).

Consistent with 50 CFR 600.10, the Council describes EFH conservation measures in its FMPs. The Pacific Coast Groundfish FMP describes Essential Fish Habitat Conservation Areas, which are spatially discrete areas of particularly sensitive or productive benthic habitats where fishing with some or all types of bottom-contact fishing gear is prohibited. The MSA also authorizes the Council to designate habitat areas of particular concern (HAPC), a subset of EFH, and therefore subject to consultation, based on one or more of the following considerations:

(i) The importance of the ecological function provided by the habitat.
(ii) The extent to which the habitat is sensitive to human-induced environmental degradation.
(iii) Whether, and to what extent, development activities are, or will be stressing the habitat type.
(iv) The rarity of the habitat.

HAPC designations for Pacific Coast Groundfish include rocky seafloor, canopy kelp, seagrass, estuaries, and unique areas such as seamounts and canyons. HAPC designations for Pacific salmon include kelp, estuaries, spawning habitat, submerged aquatic vegetation, complex flood channels and thermal refugia. Many other important habitat features are included in the overall description of EFH, including methane seeps, sand, mud, and coral/sponge habitats.

MSA National Standards
The MSA includes ten National Standards (NS) that are principles to be followed in any FMP to ensure sustainable and responsible fishery management. NMFS has developed regulatory guidance for the ten National Standards (50 CFR Part 600 Subpart D). With those standards in mind, the Council **recommends** that the analysis of the effects of offshore aquaculture activities on fishery resources consider:

- The effects of the proposed action on the ability of fisheries to continue to achieve optimum yield from managed wild fish stocks (NS1 – 50 CFR § 600.310).
- The effects of the proposed action on the sustained availability of fishery resources to fishing communities near any proposed or designated AOA, and on the sustained participation of those fishing communities in fisheries (NS8 – 50 CFR § 600.345).
- The effects of the proposed action on fishing vessel safety of navigation and safety of human life at sea (NS10 – 50 CFR § 600.355).

Scope of Council Comments
The NOI describes the proposed action identification of geographically discrete areas within Federal waters off the coast of Southern California that would be suitable to site future aquaculture development. It further outlines four preliminary alternatives, one of which is the No Action Alternative.

NOAA seeks comments "*concerning the scope of the proposed action, its potential impacts to the natural and human environment, means for avoiding, minimizing, or mitigating potential impacts, the range of preliminary alternatives proposed in this notification, and any additional reasonable alternatives that should be considered within the Southern California Bight*." Additionally, NOAA

is requesting public comments on 16 specific items. The Council provides the following comments on several items that are particularly relevant to Council mandates and authorities.

(1) The scope of the National Environmental Policy Act (NEPA) analysis, including the range of reasonable alternatives described above

Again, the Council appreciates NOAA's thoughtful approach with this effort. The Council fully supports the preparation of a PEIS and considers the preliminary alternatives to appropriately represent the range of potential alternatives. As we understand the scope of the PEIS, it would not include designating areas outside the boundaries of the North or Central North Study Area Selected Site Options (SSOs), although alternative areas within those Study Areas could be proposed. We offer our comments with that understanding. The Council **recommends** that the scope of the NEPA analysis be comprehensive in nature and include the following social, economic, ecological, and environmental effects for seaweed, finfish or shellfish mariculture. These effects are further discussed in the relevant sections of this letter:

- Physical effects on seafloor habitats and benthic organisms through disturbance from anchoring systems, shading, smothering, scouring, etc.;
- Physiological effects on benthic organisms and to benthic community composition from increases in organic nutrient loads and eutrophication from excess feed, excrement, etc.;
- Changes in hydrodynamics caused by facility infrastructure (e.g., reduced current velocity, altered circulation patterns);
- The cumulative and synergistic effects of aquaculture when coupled with climate-induced ocean changes;
- Chemical contamination from therapeutants, antimicrobials, antifoulants, algaecides, pesticides, etc.;
- Changes in water chemistry from feed and metabolic waste (e.g., phosphorus, nitrogen, turbidity, dissolved oxygen);
- Spread of antimicrobials, etc. to wild stocks;
- Transmission of disease to wild stocks and/or other native species in the ecosystem;
- Effects of cultivation and introduction of non-indigenous species on wild, native species and habitats;
- Escape of cultured (native and non-native) seaweed/kelp gametes, colonizing and affecting wild seaweeds/kelps. Recent catastrophic collapse of kelp forests coastwide indicate wild kelp populations are a vulnerable resource that could be further compromised by genetic mixing and competition from cultured species operations;
- Escape of cultured (native and non-native) finfish, progeny, and gametes; predation on or colonizing wild fish stocks, including interbreeding with wild fish, decrease in genetic diversity and resilience; and competition for habitat and food;
- Escape of cultured (native and non-native) shellfish, progeny, and gametes;
- Escape of genetically modified fish, shellfish, or macroalgae. California prohibits transgenic species without a restricted species permit (T14 671(c)(11)). Further, these permits are only issued for transgenic species held in CLOSED systems (T14 671.1(a)(8)(A));
- Attracting and concentrating predators of wild fish stocks and other species (sharks, marine mammals, seabirds);

- Attracting wild fish to the site, possibly reducing fishing access to those fish. Conversely, attraction and crowding can affect reproduction, movement, and migration, resulting in increased capture rate;
- Entanglement of marine mammals, seabirds and turtles in floating and hanging lines and other gear associated with any installations, and increased risk of vessel strikes, and how impacts to these fisheries-constraining species could affect Council and non-Council managed fisheries;
- Effects of marine debris (nets, lines, cages, etc.) on fish and shellfish species, habitats, fishing gear, and navigational safety;
- Anchored mooring systems are at risk for breakage during frequent and severe regional storms, potentially damaging rocky reefs and creating navigation hazards;
- Social and economic losses to current users, including commercial and recreational fisheries, and other recreational users, including passenger excursions.

(2) Suitable species and gear for aquaculture

The Council has serious concerns about the potential introduction of non-native species (fish, shellfish and macroalgae) into waters of the California Current Large Marine Ecosystem, and the potential effects on native species. Top among our concerns is the risk these species pose, including disease transmission, competition for resources, and interbreeding. Additional concerns are noted above under scoping. Many harvesters and stakeholders are not in favor of non-native species being propagated in the Southern California Bight. For these reasons, the Council is very concerned about the cultivation of any non-native species (finfish, shellfish, or macroalgae), or inclusion of these species in the PEIS. The PEIS should include detailed analysis of effects associated with the presence and propagation of non-native species.

To avoid and minimize potential impacts, gear should have as small a surface footprint as possible. Safety should be of paramount importance and all necessary steps must be taken to ensure mariner and public safety. For example, grow lines for shellfish operations should be weighted and incapable of floating to the surface should they break free from any mooring systems. Buoys should be marked and lit in compliance with United States Coast Guard requirements for navigational safety buoys, and the locations should be made readily available to the maritime community via the Local Notice to Mariners and communicated to coastal and fishing communities in the Southern California Bight.

All potential gear types should be analyzed for potential impacts to habitat, fish/shellfish species, protected species, the California Current Ecosystem, safety, and navigation. Best practices regarding gear configurations, deployment and maintenance should be followed to avoid impacts, including those identified above. If finfish aquaculture is proposed for individual projects covered by this PEIS, net pens should undergo greater scrutiny than shellfish or macroalgae projects due to the risk of damage and escapement. They should be rigorously tested for their ability to withstand severe ocean conditions or other circumstances that could damage the integrity of the net pens and risk escapement of cultured fish, such as the catastrophic escapement of net-pen farmed Atlantic salmon in Puget Sound in 2017. Additionally, NOAA should consider requiring double walls and/or other requirements to minimize the possibility of escapement. Current finfish technology utilizes underwater cages that appear to be less prone to failure.

The Council is also concerned that offshore aquaculture operations could result in an increased presence of marine debris from lost equipment, which can pollute and impact the surrounding marine environment, including nearby coral and sponge habitat, fish nursery grounds, or other important or sensitive habitat features. The Council **recommends** the PEIS adequately analyze the risks of marine debris and include a requirement for a Marine Debris Management and Monitoring Plan to minimize the risk of aquatic pollution. Such a plan should also include unique marking or branding of all aquaculture gear with contact information. If consistent discoveries of certain gear types are found, the project should evaluate and implement use of alternative gear types or practices that would reduce these consistent sources of debris.

NOAA should also consider insurance, bonding requirements, or other financial guarantees to ensure a project operator will have funds available for any necessary gear cleanup and/or any damages resulting from escape. The PEIS should evaluate the appropriate amount of insurance, bonding, or financial guarantee.

(3) Suitable reporting requirements for owners and operators of aquaculture facilities

Project applicants should be required to regularly and publicly report on all aspects of the operations, functions, impacts, and problems associated with site surveys and characterization, facility construction and maintenance, as well as decommissioning activities. In addition to regularly scheduled monitoring and reporting, project applicants should be required to immediately report any interactions or accidents such as interactions with non-project vessels and/or gear deployed by those vessels, marine wildlife, any loss of aquaculture gear or other infrastructure associated with the facility, high mortality or escapement of species being propagated, efforts to recover escaped species (see comments under Item 2 above), accidental release of contaminants, excess feed or waste material, etc.

Aquaculture facilities should also be required to report the details of aquaculture project production, including species, weight, product form (frozen, fresh, filleted, round, etc.), and to the extent possible, the destination markets of aquacultured product. This information will help to understand the potential effects on wild-caught fisheries and markets.

Project applicants should be required to regularly monitor the facility and operations. This monitoring, at a minimum, should include visual inspections of all ropes, cables, and equipment to help determine if any entanglement of marine wildlife has occurred, to document the as-built condition of the facility, and to ensure that: (a) no part of the facility has been broken, lost or unintentionally removed; (b) all longlines, anchor lines, buoy lines, grow lines, or any other lines utilized by the facility remain taut and in good working condition; and (c) any derelict fishing gear or marine debris that collects on the facility is removed and disposed of at an appropriate onshore facility.

The Council **recommends** that the PEIS analyze the feasibility and the need of requiring a comprehensive long-term Operations and Monitoring plan for identifying operational issues that could cause adverse effects to water quality, wild marine species, and benthic habitat. This monitoring plan should be developed in conjunction with the appropriate Federal and State permitting agencies. Monitoring measures should be described with sufficient detail in the PEIS to support the evaluation of monitoring plans proposed by project applicants. The Council

recommends adding that owners/operators study new technologies and propose alternatives that reduce or prevent discharge of uneaten feed or metabolic waste.

To assess whether aquaculture facilities are causing an effect on environmental conditions will first require obtaining substantial baseline information on water quality, ocean dynamics, species composition and age class, and habitat characterization at the AOAs. The Council **recommends** an Environmental/Species Baseline Assessment Plan be required in addition to a Monitoring Plan with spatial coverage beyond the proposed lease area to account for drift effects. The Council also **recommends** that baseline information be gathered seasonally and for a minimum of two years to account for natural variability. Similarly, post-project monitoring should also account for seasonal and annual variability for species and oceanographic conditions. The monitoring plan should also be used to assess whether the proposed setbacks from EFH HAPCs, deep sea coral and sponges, and hard bottom habitat are sufficient to avoid impacts to those sensitive habitats. Additionally, the Council **recommends** the PEIS include a detailed mitigation and adaptive management plan that can be immediately implemented if impacts to water quality, marine species, or benthic habitat are observed during monitoring.

(4) Types of aquaculture (e.g., finfish, shellfish, seaweed, integrated multi trophic aquaculture) that could be supported and/or analyzed

Integrated multi-trophic aquaculture contemplates propagation of multiple aquatic species from different trophic levels are farmed in an integrated fashion to improve efficiency, reduce waste, and provide ecosystem services, such as bioremediation. While this may be appealing in a controlled environment, we remain concerned about prevailing currents and sea states in the SSOs which may not lend themselves to such an approach. The benefits of finfish multi-trophic aquaculture systems, primarily characterized as reducing the net discharge of organic wastes leading to subsequent oxygen drawdown via water column respiration, and efficient trophic transfer directly among culture species, are entirely dependent on details of the aquaculture systems, species, growth conditions, and site hydrography that are far from standardized in the nascent field of multi-trophic aquaculture. Most implementations of these approaches are still experimental and unproven at commercial scales. The effects of multi-trophic mariculture are likely to include disease transmission, attraction of wild species, biofouling, mechanical or chemical control, and other impacts associated with more common ocean aquaculture operations. The Council **recommends** that before finfish multi-trophic aquaculture is considered, the project proponent(s) be required to show proof of concept. The proposed PEIS may not be appropriate for experimental industries such as finfish multi-trophic aquaculture, where outcomes and impacts are not well-established, and have not been tested on the U.S. West Coast.

(5) Potential impacts to biological, physical, social, cultural, and economic resources

This section describes some (but not all) of the potential biological and physical impacts we identified under Item #1 (Scope). While these comments and recommendations are focused on the operations of aquaculture facilities, they are also applicable to pre-construction surveys, site characterization, and decommissioning activities.

Impacts to Water Quality, Benthic Habitat, and Ocean Conditions

The Atlas identified biologically important and sensitive habitats that were deemed unsuitable for AOA development. To minimize potential impacts, the Atlas considers setbacks from certain

habitats or management areas: rocky reef EFH HAPCs with a 500-ft setback, deep sea coral and sponge observations with a 500-m setback, hard bottom habitat with a 500-ft setback, fish havens with a 500-ft setback, and National Marine Sanctuaries. However, the Council is concerned that the proposed setbacks may be insufficient to protect these sensitive habitats. Nutrient enrichment from fish and shellfish excrement and excess feed can result in benthic algal growth, harmful algal blooms, oxygen depletion of the water column and underlying sediments, smothering of benthic invertebrates, and other detrimental impacts to benthic communities and habitat (Holmer 2010; Wilding 2012; Price and Morris 2013). Nutrient enrichment from aquaculture projects can further intensify existing threats to marine ecosystems, including increasing acidic and hypoxic ocean conditions (Cai et al. 2011, Kessouri et al. 2021). Of particular concern among climate scientists is the potential for cumulative and synergistic effects of hypoxia and ocean acidification. Organic nutrient load is an important driver in ocean acidification and hypoxia processes, and finfish mariculture projects should be scrutinized as they can introduce substantial amounts of organic material depending on production volume, both individually and cumulatively. In fact, the Environmental Protection Agency now prohibits discharges of offshore seafood processing waste in nearly 3,770 square miles on the continental shelf off Oregon and Washington after concluding that seafood processing waste has the potential to exacerbate hypoxia in the region (EPA NPDES Permit No. WAG520000). The Council **recommends** adding the water quality requirement recently imposed by Washington Department of Ecology that owners/operators study new technologies and propose alternatives that reduce or prevent discharge of uneaten feed and metabolic waste.

The Council is also concerned with impacts on water quality and sensitive habitats from the use of pharmaceuticals, such as antimicrobials and antifungals, and other pollutants and/or chemicals such as antifoulants, algaecides and pesticides. Some materials used in aquaculture gear, such as those designed to prevent or control biofouling, can leach into the surrounding water and be harmful to marine resources or the surrounding ecosystem. Additionally, impacts to water quality and benthic habitat could occur during transportation and mooring of aquaculture support vessels, from spills of oil and other hazardous material, or from scouring of benthic habitat from vessel anchors.

The Council **recommends** the PEIS analyze all potential impacts to water quality, species, benthic habitat, and the surrounding ecosystem associated with different aquaculture proposals (e.g., gear types, species) and at various spatial configurations and scales to determine the type, spacing, and scale of projects that will be the least impactful and most compatible with marine resources. The analysis should address impacts noted above throughout these comments. The PEIS should examine whether a 500-foot buffer around sensitive habitats (e.g., rocky reef HAPC, coral/sponge habitat, kelp beds, etc.) is sufficient to prevent impacts to these resources. The Council **recommends** the PEIS describe siting decisions, gear types, and best management practices that future aquaculture operations will use to avoid and minimize the effects noted above; as well as analyzing.

Offshore aquaculture can also cause changes in ocean conditions by reducing current velocity and altering circulating patterns (Stevens et al. 2008; Lin et al. 2016). There remains a need to better understand the effects of finfish, shellfish, and macroalgae offshore aquaculture facilities on ocean hydrodynamics. Given the large size of each discrete AOA (between 500-2,000 acres), and the

potential for AOAs to be sited in a single, continuous geographic space, aquaculture infrastructure will likely alter circulation patterns and current speeds. Changes in local hydrodynamics caused by aquaculture infrastructure could exacerbate stressors that are already impacting offshore and coastal habitats, such as hypoxia, ocean acidification, marine heat wave events, and ocean warming. Impacts to currents and circulation patterns can also lead to changes in sedimentation and larval transport and dispersal. The Council **recommends** the PEIS analyze potential impacts of aquaculture infrastructure and gear on the surrounding ocean conditions and how that is predicted to be exacerbated by climate change.

Monitoring of Water Quality, Habitat and Ocean Conditions
As discussed under Item #3 (Reporting), the Council **recommends** that the PEIS require a comprehensive long-term Environmental Monitoring Plan to identify operational issues that could cause adverse effects to water quality, wild marine species, and benthic habitats.

Fish Escapes, Naturally Occurring Toxins, and Introduction of Non-native Species, Pathogens, and Parasites
Of significant concern is the escape of cultured species into the wild, and the potential for unintended introduction of a non-native fish, shellfish, and macroalgae species, which could cause significant impacts to native species and habitats. Escaped cultured fish may interbreed with wild fish and thereby decrease the genetic diversity of wild populations, compete with wild fish for important habitat and food resources, consume native species as prey, and increase the risk of disease transmission to wildlife (Holmer 2010). If fish are grown to maturity, escaped eggs and larvae can also disperse into the environment (Jørstad et al. 2008, Uglem et al. 2012, Holmer 2010). Pathogens associated with cultured fish may be transmitted to wild populations, an impact that could persist within native populations even if escaped cultured fish are unsuccessful at establishing reproductively viable populations (Mordecai et al. 2021; Morton et al. 2017). In 2018 net pen aquaculture of non-native fish was banned in the state of Washington after a massive escapement of Atlantic salmon. Similar legislation is proposed in British Columbia, largely due to the risks of non-native fish escapes and transmission of diseases. Suspended culture sites may also facilitate introduction or spread of invasive species. This has been demonstrated extensively in suspended bivalve aquaculture (McKindsey et al. 2011). There is also risk of escapement of cultured species and pathogens during transportation of live and processed products to and from the AOAs.

Depending on the time of year and ocean conditions, there can be algal blooms resulting in saxitoxin (Paralytic Shellfish Poisoning). Also, in California domoic acid is monitored due to Amnesic Shellfish Poisoning concerns. Both toxins are monitored by the California Department of Public Health, Environmental Management Branch Marine Biotoxin, and Phytoplankton Monitoring Programs[1]. These are just a couple of the naturally occurring toxins which can cause consumer illness[2]. Harvests could be shut down due to red tides and Paralytic Shellfish Poisoning, or the presence of high levels of domoic acid in seafood, which is shown to disproportionally

[1] See - Shellfish Program (ca.gov)
[2] A more complete list can be found here - Fish and Fishery Products Hazards and Controls Guidance Fourth Edition – August 2019 Chapter 6: Natural Toxins (fda.gov)

impact small-scale fishers[3]. The Council **recommends** the PEIS consider the potential impacts of naturally occurring harmful algal blooms on farmed species and on human consumers.

The Council **recommends** that the PEIS evaluate how AOA operations will avoid, minimize, and respond to fish escapement at the facility and during transport of live and processed products to and from the AOAs. The PEIS should analyze the potential impacts from accidental introduction of non-native species (fish, shellfish, and macroalgae) into the marine environment and the impacts from potential introduction of new pathogens or parasites that these species may carry.

Impacts to social and economic resources
The PEIS should analyze social and economic impacts to current users, including commercial and recreational fisheries, and other recreation activities such as sailing, whale watching and other passenger excursions, and other maritime operations not covered above. The Council recognizes that some economic impacts may not be readily calculable, for example opportunity costs and recreational values. Increased fuel consumption by vessels having to avoid the AOAs will increase the carbon footprint (climate cost) in addition to higher expenditures on fuel. The PEIS should also analyze changes in both supply and demand for current seafood products, with particular attention to consumer preferences in the geographic areas in and around the AOAs. Any loss of locally sourced, wild-capture seafood may have a negative impact on the local seafood economies in those areas. Additionally, the potential loss of market value of wild-capture finfish due to new competition from cheaper farmed finfish should be analyzed as well.

Cumulative Effects
The Council **recommends** the PEIS evaluate the potential cumulative effects from multiple aquaculture projects within the AOAs as well as with other ongoing and foreseeable activities in the project area. Other proposed aquaculture projects offshore of southern California include Pacific Ocean Aquafarms, Ocean Rainforest, and Avalon Ocean Farm. Other activities that should be included in the cumulative effects analysis include, but are not limited to, navigational channel maintenance dredging, future renewable energy projects, and subsea cable installation. Additionally, the cumulative effects analysis should consider the potential environmental impacts to sensitive habitats and species from concentrating fishing effort that has been displaced outside of AOAs.

(8) Information related to diversity, equity, and inclusion in aquaculture and the seafood sector

The Council very much appreciates NOAA's commitment to diversity, equity, and inclusion, and supports the need to ensure that the aquaculture and seafood sectors are part of those discussions. The fishing, processing, and related industry sectors depend on a diverse workforce, and the Council supports recognition of the entire seafood industry and the impacts to the businesses and employees, in considerations of AOAs. Other proposed offshore activities that could or would impact these sectors often neglect to include the fishing, processing, and related sectors in planning processes.

[3] Jardine, Sunny L., et al. "Inequality in the economic impacts from climate shocks in fisheries: the case of harmful algal blooms." *Ecological Economics* 176 (2020): 106691.

Specifically related to diversity, equity, and inclusion in aquaculture and the seafood sector are concerns surrounding the marketing of the catch. As NOAA considers the economic feasibility of offshore aquaculture, NOAA should be communicating with the California Department of Public Health, Environmental Management Branch and the Food and Drug Administration's Division of Seafood Safety[4]. These agencies can advise on processes in place that are implemented when toxins reach certain action levels, warnings and quarantines are issued to protect the recreational fishing public and shellfish consumers.

(10) Potential interactions with protected species, essential fish habitat, and other sensitive habitats

The Atlas provides information on areas important to humpback whales in Table 2.3. Table 2.4 identifies ESA-listed species providing their status and population trend. Table 2.5 identifies marine mammals protected under the Marine Mammal Protection Act. The North Study Areas SSOs lie within the Santa Barbara Basin Important Bird Area.

The Atlas specifically mentions critical habitat for black abalone, seagrasses, and humpback whale. The Council **recommends** analysis of other potentially applicable critical habitats for the species identified in Table 2.4 and inclusion of potential impacts to the Southern California Distinct Population Segment (DPS) of steelhead. Critical habitat for the Southern California DPS of steelhead includes the Ventura River, Coyote Creek, and the Santa Clara River. The close proximity of the North Study Areas SSOs to the mouths of those rivers could impact the steelhead's abilities to return to the river to spawn. As noted in Table 2.4, white abalone is listed as endangered under the Endangered Species Act (ESA), but no critical habitat has been designated[5]. White abalone live on rocky substrates alongside sand channels, which tend to accumulate the algae they eat. They are usually found at depths of 50 to 180 feet, making them the deepest living abalone species. Historically, white abalone were found in the Pacific Ocean from Point Conception, California, to Punta Abreojos, Baja California, in Mexico[6]. Blue whales are also listed as endangered under the ESA, and there is currently no critical habitat designation for the blue whale. This does not violate the ESA, as it is not required to identify critical habitat for species listed prior to 1978. The Atlas acknowledges that blue whales are known to occur in the Southern California Bight. Stakeholders have noted that blue whales frequent areas near the North Study Areas Selected Site Options.

When discussing NMFS Protected Resources, the Atlas appears to have limited its analysis to highly vulnerable protected species (Atlas, page 23) "so there are a number of protected species, especially marine mammals, that were excluded. Those species will need to be considered during the PEIS stage to determine overall suitability of potential AOA options." Of the species listed on Table 2.5, the following are known to frequent both SSOs: harbor seal, California sea lion, eastern North Pacific gray whale DPS, and all of the dolphin species listed except the coastal bottlenose dolphin. The Draft U.S. Pacific Marine Mammal Stock Assessments: 2021[7] removes all references

[4] https://www.fda.gov/media/85073/download

[5] NOAA Fisheries has determined that it is not prudent to designate critical habitat because identification of such habitat is expected to increase the threat of poaching for white abalone. See 66 FR 29046 (2001)

[6] See - White Abalone | NOAA Fisheries

[7] See - Draft 2021 Pacific SARS.pdf (noaa.gov)

to coastal bottlenose dolphin. We suggest clarifying or explaining the status of the coastal bottlenose dolphin.

Interactions of aquaculture structures and support vessels with protected species can be detrimental to their existence. As these species also tend to constrain fisheries, impacts to protected species can further constrain fishing. These impacts include changes in migratory patterns which make co-occurrence with fishing gear more likely than in the absence of aquaculture structures. The PEIS should attempt to quantify the potential for interactions with, and impacts to, protected species and consider this in their final selection of AOAs.

(11) Potential interactions with commercial and recreational fishing industries, tourism and recreation, and other offshore ocean users

There will necessarily be interactions and impacts to the commercial and recreational fishing industries. These may range from the significant, such as the loss of access to important fishing grounds, to the insignificant, such as having to alter course slightly to get to your intended destination. The impacts will differ depending on the fishery and the sector. For example, tuna or swordfish harvesters based in the area will not likely be displaced from fishing grounds, but the North Study Areas SSOs are located on grounds important to highly migratory species fishermen targeting thresher sharks as well as non-highly migratory species fishermen targeting ridgeback prawn, sea cucumber, California halibut, coastal pelagic species, and other fisheries. Before the decline of the salmon fishery, those areas were important to salmon trollers. The impacts will be felt by the commercial and recreational fishermen and women as well as by members of the fishing and coastal communities which are dependent upon their activities. We note, as was highlighted in the Atlas, commercial fishing is not allowed in the Central North Study Area, with limited exceptions.

Data Improvement

We appreciate the thoroughness of the Atlas and the amount of work that went in to preparing the document. We do, however, have some recommendations for how the data utilized in the Atlas can be improved upon:

- Vessel traffic was a consideration in identifying the AOAs. The Atlas correctly states that Automated Identification Systems (AIS) are required on fishing industry vessels. However, the Atlas misstates those requirements when it says, "fishing industry vessels of various size and tonnage are required to carry AIS transponders to support commercial fishing and fish processing." Coast Guard regulations require AIS on commercial fishing vessels 65 feet or more in length[8]. This requirement went into effect on March 1, 2016[9]. Based on input from fishermen in the area, the vast majority of commercial and recreational vessels which utilize the area in and around the AOAs are less than 65 feet in length, and thus not required to have on board an operational AIS. Reliance on AIS data likely underestimates the amount of fishing industry vessel traffic in the Study Areas. The Council **recommends** NOAA engage with local commercial and recreational fishery participants in an effort to gain a better understanding regarding the use of the Study Areas by commercial and recreational fishing vessels.

[8] 33 CFR §164.46
[9] 33 CFR §164.46(j)

- The Atlas states that fishing vessel transits in 2019 in the North Study Area are focused from the harbors of Ventura, Santa Barbara, and Channel Islands (Atlas p 60). This fails to capture the importance of Port Hueneme to the commercial fishing industry. 2010 – 2019 landings and ex-vessel revenues coming into Port Hueneme are provided in the table below[10]:

Year	Pounds	Ex-vessels revenues
2019	3,294,274	$2,514,511
2018	13,908,010	$8,264,201
2017	35,936,403	$18,481,438
2016	17,224,213	$9,300,002
2015	17,886,149	$5,849,371
2014	34,677,838	$11,507,240
2013	36,324,835	$11,923,632
2012	36,791,416	$10,707,442
2011	58,916,159	$14,768,970
2010	60,385,096	$17,985,224

The vast majority of offloads into Port Hueneme consists of market squid and other coastal pelagic species.

- Throughout the Atlas, vessel monitoring system (VMS) datasets are used to identify where certain types of commercial fishing activity occurs. The VMS data provided only covers 2010 – 2017. The Council **recommends** including more recent datasets for VMS and other fishery datasets incorporated into the model[11]. We are also concerned that VMS data is provided for two fisheries which are not prosecuted in the Southern California Bight – the Pink Shrimp Trawl fishery and the Dungeness Crab Trap or Pot Gear fishery; and references VMS data for fisheries for which VMS is not required - for example, sheephead trap or pot gear and Dungeness crab trap or pot gear. Table 3.5 references VMS dataset 269 – "A gear that is not listed above." Examples of gear types that would fall under this category would be helpful.

- In the North Study Areas there would be conflicts with commercial passenger fishing gear and private boat fishing operations, especially in waters deeper than 100 meters. These areas have become more accessible to anglers lately because of changes in regulations, in addition to improvements in fish finder and fishing gear technology.

- The Council is generally aware of ecotourism which takes place in and around the North Study Areas, particularly whale watch excursions. It does not appear that the Atlas captures those operations or associated vessel traffic.

[10] Values from CDFW Final California Commercial Landings, Table 19 PUB - Poundage And Value Of Landings By Port, SANTA BARBARA Area for each year, 2010 – 19. See - Final California Commercial Landings

[11] A number of datasets incorporate data up to and including 2019. These should be expanded to cover 2021 (or 2022 for those fisheries for which that data is available. For example – commercial passenger fishing vessels, CRFS, Observer data, microblocks for market squid and lobster.

- This above results in less confidence in the analysis provided in terms of potential impacts to fisheries and fishing communities. As such, the Council **recommends** NOAA engage with the local commercial and recreational fishing industries in an effort to validate and correct the datasets provided in the Atlas and used in the area identification process.

Safety concerns

The safety of vessels and their crews near aquaculture facilities within AOAs is extremely important and should be addressed. Providing for safety other than blanket spatial exclusions or restrictions from accustomed commercial and recreational fishing methods is insufficient. Aquaculture facilities should bear some of the burden of and tolerance for the occasional fishing gear entanglement as part of their lease requirements. Previously permitted aquaculture operations in Federal waters off the Southern California coast were required to implement a Lost/Damaged Fishing Gear Compensation Plan as a condition for their Consistency Certification[12]. Conversely, commercial and recreational fishermen should be aware of the additional risk of gear entanglements, should they choose to fish in proximity to aquaculture facilities. Regarding recreational fishing near aquaculture facilities, we note that recreational anglers historically have not been excluded from fishing near structures such as oil rigs, except under specific Homeland Security measures. Even then, rig operators use discretion to enforce the rules, such as when rig maintenance or crane work is performed that may endanger recreational vessels and fishermen. Similar rules should apply to aquaculture facilities, recognizing the occasional loss of recreational gear. That is, anglers should not be excluded from fishing around aquaculture facilities, provided they can do so safely, without losing recreational gear or entangling the aquaculture facility.

As NOAA further conducts the analysis required to refine the marine spatial planning outlined in the Atlas, we suggest undertaking an effort to forecast which areas will be important to different or new fisheries under changing ocean conditions. Fishermen remain concerned about how regulations may affect current (or near-future) fishing and the effects it will have on those future fisheries. That is, sport and commercial fishing regulations and/or other forms of limiting access may change such that fishermen will have to look to other areas for harvest; some of those areas may have aquaculture operations in effect by then. We must also be mindful of fisheries which are currently closed due to the status of the stock, but which will likely be re-opened when appropriate – for example, the directed fishery for Pacific sardine which has been closed since 2015.

(12) Information on other current or planned activities in, or in the vicinity of, the areas described in this NOI and their possible impacts on aquaculture development, or the impact of aquaculture developments on those activities

There are a number of current, planned, or proposed activities in the vicinity, or likely to be serviced by vessels in the vicinity. Generally, they fall into three categories: current maritime uses, offshore renewable energy development, and other aquaculture projects.

Current Maritime Uses:

[12] See Condition 7 of the California Coastal Commission's Staff Report for Consistency Certification CC-035-12, KZO Sea Farms – (California Coastal Commission Staff Report and Recommendation Regarding consistency Certification No. CC-035-12 (KZO SeaFarms, Los Angeles County)) and Special Condition 8 of the California Coastal Commission's Staff Report for Consistency Certification CC-0003-21, Ocean Rainforest, Inc. – (F12a-10-2021-report.pdf (ca.gov))

- As was more fully developed under Item 11 above, recreational and commercial fishing activities are currently utilizing all of the Selected Site Options for fishing or navigational purposes. Vessels of all types and uses transit through the areas. We suspect that vessels servicing the oil platforms off the Ventura coast may also transit through these areas.

Offshore Renewable Energy:

- The Bureau of Ocean Energy Management has recently published a Proposed Sale Notice for the Morro Bay Wind Energy Area. Winning bidders will be allowed to conduct site assessment and site characterization activities in and around the Monterey Bay Wind Energy Area.
- There are two proposed offshore wind pilot projects in State waters (within 3 nautical miles of the coast) near Point Arguello.

It is unlikely that site assessment and/or site characterization activities will impact the aquaculture development, but questions remain as to whether wind development proposals may affect the suitability of any areas for aquaculture. These two efforts don't seem very coordinated and could have overlaps that affect the suitability of locations for either. However, if vessels performing site assessment or site characterization activities, or vessels aiding in the construction or deployment of those activities, or vessels servicing those areas are based in Ventura Harbor, Channel Islands Harbor, or Port Hueneme, there is a possibility that aquaculture development could be impacted. Depending on the prevailing weather conditions and the size and type of those vessels, there may be navigation challenges. Some of the areas in the North Study Areas SSOs lie in a direct course line between those harbors and Point Conception and/or Point Arguello. Some of these vessels may have significantly deeper drafts than the vast majority of other vessels which typically use, or transit through, those areas.

Other Aquaculture Projects

- Pacific Ocean Aquafarms. It is our understanding that NOAA is undertaking an Environmental Impact Statement for the proposed Pacific Ocean Aquafarms development of a commercial-scale finfish aquaculture facility. This project is proposed to be located approximately four nautical miles off the coast of San Diego, with an alternate site off Huntington Beach. The project proposes construction, operation, and maintenance of an offshore marine finfish aquaculture facility composed of submersible net pens.

- Ocean Rainforest. In 2021, the California Coastal Commission issued a conditional concurrence on a consistency certification request to temporarily install and operate a demonstration seaweed aquaculture facility on an 86-acre site in Federal waters approximately 4.4 nautical miles offshore of Santa Barbara[13]. The facility would be comprised of a variety of ropes, lines, buoys, and cultivation equipment that would be anchored to the seafloor and held submerged at a depth of between 33 and 49 ft below the ocean surface. The depth at the proposed site is between 246 and 262 ft. The facility itself would occupy 16 acres and would be used to grow native giant kelp on an array of 32 cultivation lines. The project is intended to last for two years, at which point the project

[13] See - F12a-10-2021-report.pdf (ca.gov)

applicants would fully remove the aquaculture facility and all associated anchors, buoys, cultivation lines, and kelp.

- Avalon Ocean Farm. In early 2020, Avalon Aquafarms submitted an Application for Permit[14] to the U.S. Army Corps of Engineers, Los Angeles District, for an aquaculture facility – Avalon Ocean Farm. In the summer of 2021, the Applicant submitted an updated Application with a revised location and project description[15]. It is proposed to be located in the Pacific Ocean offshore of Long Beach. A map of the proposed location can be found in the application included in footnote 5. The proposed activity is to install a 1,860-acre shellfish and macroalgae aquaculture facility in Federal waters offshore from Long Beach and/or Huntington Beach. The facility would consist of three commercial scale subsurface aquaculture plots consisting of multiple submerged longlines on which shellfish and kelp would be grown.

Scientific Surveys

The Council is concerned about the potential for spatial conflicts with fisheries surveys and other marine scientific surveys, including long-term ocean monitoring that may occur in these areas. The loss of data from these scientific surveys due to spatial conflicts from aquaculture installations would likely increase uncertainty in certain stock assessments. Increased uncertainty may translate into reduced opportunity (e.g., lower catch limits) under the precautionary principle and economic impact to fishing communities. The Council **recommends** that the PEIS analyze whether any of the AOAs will conflict with NOAA, the California Cooperative Fisheries Research Investigations, or other scientific surveys[16], and avoid such impacts to the extent possible.

(14) Input related to the risks and/or benefits of whether an AOA should be a single, continuous geographic space, or a collection of discrete areas separated from one another.

The Council **recommends** analysis of the impacts of a larger continuous AOA space versus a collection of smaller discrete areas. The Council is concerned about navigation and transit as it pertains to fishing activities, search and rescue operations, scientific surveys, and other important navigation activities.

(15) Input related to how an AOA could simultaneously support aquaculture development along with environmental, economic, and social sustainability—including ways to incorporate mitigation and cost-benefit analyses.

When developing the PEIS, NOAA should consider whether impacts or changes that justify mitigation be more specifically defined. This could proactively contemplate changes/impacts that are likely to being blamed on other factors (e.g., offshore wind energy development). This is particularly concerning for species with large natural fluctuations since significant changes may be caused by outside factors (i.e., aquaculture) but just attributed to natural variation.

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[14] See - `ramswp51p~«CORPS_LOGO2»PUBLIC NOTICE (army.mil)

[15] See - `ramswp51p~«CORPS_LOGO2»PUBLIC NOTICE (army.mil)

[16] For example, the California Wetfish Producers Association has been conducting various research studies inside the Southern California Bight. Including one in cooperation with the Southwest Fisheries Science Center where a smaller purse seine vessel is performing a nearshore acoustic survey for Coastal Pelagic Species in waters inaccessible to the larger NOAA vessels. See - 2021 California Current Ecosystem Survey | NOAA Fisheries.

(16) Other information relevant to the Proposed Action and its impacts on the human environment.

The Atlas also mentions naturally occurring oil seeps[17] which are prevalent in the North Study Areas SSOs. In areas off Ventura, fishermen have noted the potential incompatibility of aquaculture in those areas with the prevalence of natural oil seeps, and the prevailing winds and currents which could cause contamination.

The Council appreciates the opportunity to provide comments on NOAA AOAs. We look forward to the draft PEIS and intend to provide further comments when it is released. If you have any questions, please contact Kerry Griffin on Council staff (Kerry.griffin@noaa.gov; 503-820-2409).

Sincerely,

Marc Gorelnik,
Chairman

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[17] See page 25 (USGS Open-File Report 2009-1225 and MMS report 2009-030, text) - Lorenson, T.D, Hostettler, F.D., Rosenbauer, R.J., Peters, K.E., Kvenvolden, K.A., Dougherty, J.A., Gutmacher, C.E., Wong, F.L., and Normark, W.R., 2009, Natural offshore seepage and related tarball accumulation on the California coastline; Santa Barbara Channel and the southern Santa Maria Basin; source identification and inventory: U.S. Geological Survey Open-File Report 2009-1225 and MMS report 2009-030, 116 p. [http://pubs.usgs.gov/of/2009/1225/].

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