

San Diego Coastkeeper™ Offshore Aquaculture Position Statement

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IMPACT

SUMMARY

Offshore aquaculture facilities, or marine ‘fish farms,’ have expanded significantly over the past four decades as a response to increasing demands for seafood in the face of decreasingly robust wild fish populations.¹ Not only is offshore aquaculture growing globally, but a major offshore aquaculture facility has been proposed in the San Diego area and Congress is debating federal aquaculture legislation. Based on the known impacts of onshore, coastal, and foreign offshore aquaculture operations, offshore aquaculture has the potential to exacerbate the current ocean crisis caused by overfishing, poor fisheries management, and pollution. San Diego Coastkeeper believes that offshore aquaculture should be pursued only after maximizing fisheries management practices such as conservation, sustainable fishing practices, and ecosystem-based management efforts to help rebuild critical marine life and fish populations. Before domestic offshore aquaculture moves forward, the federal government must establish comprehensive regulations and develop a permitting system that addresses offshore aquaculture’s risks. We also encourage robust public debate regarding all proposed offshore aquaculture facilities.

OFFSHORE AQUACULTURE’S RISKS

Much of what we know about offshore aquaculture’s risks we have learned from examining land-based and coastal aquaculture. Despite efforts to reduce adverse impacts associated with the industry, aquaculture operations have caused significant environmental damage.² But not all the problems that occur with land-based or coastal aquaculture will be problematic with offshore aquaculture, and offshore aquaculture will present its own unique risks. We may not be able to fully understand all of offshore aquaculture’s risks until many years into full-scale commercial operations.

Even without full knowledge of all offshore aquaculture’s risks and potential impacts, we know that some risks include:

- **Feeding operations:** Producing a single kilogram of high-value carnivorous marine fish such as cod, sea bass, or tuna typically uses two to five kilograms of wild-caught fish processed into fish meal and fish oil for feed.³ Using wild-caught fish to feed farmed fish is inefficient from an ecological perspective and can encourage unsustainable wild fish

Definitions:

The term “**offshore aquaculture**” is used in this document to refer to any use or placement of a structure or facility in the exclusive economic zone for the intended purpose of raising and harvesting marine species. The “exclusive economic zone” is the portion of the ocean within which a nation has jurisdiction over marine resources. In the U.S., this zone extends from the seaward boundary of the coastal state to up to 200 nautical miles offshore.

Several related terms are used throughout the field of aquaculture to describe the harvesting of marine and aquatic organisms, sometimes inconsistently. San Diego Coastkeeper interprets these terms as follows:

Aquaculture: The controlled cultivation and harvesting of aquatic species in designated facilities. This may occur in land-based facilities or in ponds, lakes, rivers, or the ocean. Popular literature often uses the term “fish farming” to refer to all types of aquaculture.

Mariculture: A branch of aquaculture involving the raising and harvesting of marine species.

Nearshore Aquaculture: The raising and harvesting of marine species in facilities located within the states’ territorial waters.

Open Ocean Aquaculture: offshore aquaculture.

harvesting.⁴ Supplementing fish feed with land-based sources, like corn, soybeans, or grains, raises additional concerns.⁵

- **Sourcing and selecting farmed species:** Non-native fish species pose an unacceptable risk to native ocean ecosystems. In the past, escaped fish from aquaculture operations have introduced new and often effective predators, competitors, and disease into local ecosystems. Transporting juvenile fish used to populate or repopulate the farm raises energy and efficiency questions.⁶
 - **Escapes:** Fish escapes, especially in offshore facilities,⁷ can significantly harm genetic fitness and diversity of wild fish populations.⁸
 - **Disease:** Aquaculture is known to amplify disease and parasites due to crowded conditions, transmitting these back to wild fish. Disease can spread at a rapid pace; as water flows through the cage, parasites are washed out and can infect wild fish. Antibiotics, other drugs, and chemicals to prevent disease are passed into the environment and may be passed to the consumer.⁹
 - **Predator and wildlife interruptions:** Sharks, whales, seals, and other predators attracted by the captive fish may become entangled in the cages or their related gear. This could result in incidental death, damage to net pens, and escaped fish.¹⁰
- **Nutrient pollution:** Excessive nutrients derived from residual feed, fish waste, and other products used in aquaculture contaminate the surrounding environment. This may lead to algal blooms, depressed dissolved oxygen, or “dead zones” near the operations.¹¹
- **Cumulative impacts:** Multiple aquaculture operations in a given geographic region may have unintended or unforeseen significant cumulative impacts.
- **Siting concerns:** Offshore aquaculture facilities could potentially interrupt migration routes if they are not properly sited.¹² Offshore aquaculture on or near oil rigs poses significant environmental and consumer risks and absolves the oil company of responsibility for future damage or liability caused by the rig.

AQUACULTURE IN THE UNITED STATES

Recent estimates show that 42% of the seafood consumed in the United States comes from foreign aquaculture facilities,¹³ which often have limited resources to safeguard against aquaculture’s risks.¹⁴ Only 5% of seafood consumed in the United States comes from domestic aquaculture.¹⁵ This leads to increasing pressure for U.S.-based aquaculture to help ensure better regulation of the industry, more fish are grown locally, and to promote economic competitiveness in the industry. Concerns exist, however, that an increase in U.S.-based aquaculture may represent a race-to-the-bottom, resulting in aquaculture facilities operating under diminished standards.

At present, California has the nation’s most protective law regulating aquaculture facilities within state waters,¹⁶ but few other states have followed suit. There is no national framework for regulating aquaculture, including offshore aquaculture, though legislation is currently pending in Congress and the National Oceanic and Atmospheric Administration is developing a regulatory guidance framework for aquaculture in the U.S.¹⁷ The proposed site for the first commercial-scale offshore aquaculture project in the federal waters of the United States is only five miles from San Diego’s coastline.¹⁸

SAN DIEGO COASTKEEPER'S POSITION

San Diego Coastkeeper recognizes the mounting pressure to promote aquaculture in the United States, yet we remain wary of the potential impacts that offshore aquaculture may have on the waters along our coast. Therefore, we adopt the following position regarding offshore aquaculture:

Comprehensive approaches to fisheries management: Before looking to aquaculture to meet the nation's desire for seafood, California and the nation should devote resources to maximizing the effectiveness of a comprehensive approach to fisheries management. Strategies that should be aggressively pursued prior to offshore aquaculture include conservation, sustainable fishing practices, and ecosystem-based management efforts to help rebuild critical marine life and fish populations. Specific tactics include traditional single-species and species assemblage fisheries management, adoption of no- or limited-take marine protected areas, habitat restoration, public education campaigns aimed at altering seafood choices, and pollution prevention programs. These approaches to ensuring healthy marine life habitats and a thriving seafood industry should be practiced to their maximum potential and priority should be placed on strategies that will most effectively enhance and protect wild fisheries with minimal environmental and societal impact. We oppose incentives for aquaculture operations, including but not limited to waiving permitting fees, resource rental fees, or financial guarantees.

Federal aquaculture regime: An overarching federal regime should be developed that addresses potential environmental impacts that offshore aquaculture poses. Detailed, strong, legally binding environmental standards that protect both human health and the integrity of marine ecosystems must be in place before offshore aquaculture is authorized. A national framework, which could be based upon California's precedent-setting regulations and informed by additional studies, is needed to ensure that environmental standards are consistent, coherent, and enforceable, regardless of the location of the facility.

Continued research: Studies evaluating the benefits, costs, and risks associated with aquaculture locally, regionally, and nationally are urgently needed to help inform the creation of a federal framework regulating aquaculture. Offshore aquaculture projects should be approved only if the science supports a finding that operations will not unduly impact ocean ecosystems. Once established, aquaculture facilities should be subject to routine monitoring and prepared to adapt their practices to be more sustainable and efficient in accordance with evolving science and technology.

Public forum: A robust public workshop should take place in San Diego before any offshore aquaculture facility proposed here moves forward. We encourage robust public debate wherever offshore aquaculture is proposed before the facilities are approved. This process should engage all stakeholders to thoroughly vet the benefits, costs, and risks of such projects in a transparent setting.

Best Management Practices: Should any offshore aquaculture proposal move forward in accordance with federal and state regulations and appropriate discourse, such projects must be properly sited, scoped, and designed and employ the best available technologies to minimize any adverse environmental and societal impacts, including:¹⁹

- **Feeding operations:** Primarily, there must be a *significant* decrease of the industry's reliance on feed products derived from wild forage fisheries to ensure our wild fish stocks are not put at additional risk to satisfy industrial-scale aquaculture operations. In addition to minimizing the use of fish oil and fish meal, any wild fish that is used as feed should be acquired from populations with ecosystem-based management measures in place and whose biomass is at or above sustainable levels according to scientific monitoring. To the extent that aquaculture uses land-based feed sources, the food supply should come from sustainable sources.

- Sourcing and selection of species: All species selected for farming must be native to the respective area, and harvested fish should not be genetically modified in any way.
- Escapes: Facilities should be designed and demonstrated to be effective at preventing farmed fish escapes and withstanding severe weather conditions and marine accidents. The operator should be required to immediately report all escapes and maintain records on all escapes. The operator should also be responsible for any damage caused by the escape.
- Predator and wildlife interruptions: Siting should be prohibited in or near any sensitive habitat. Sites should be specifically determined based on detailed environmental evaluations. Additionally, operators should not be allowed to unreasonably interfere with wildlife or the ability of the environment to support ecologically significant flora and fauna. The operator should be required to develop predator management plans, which includes means of preventing entanglement, migration disruption, and changes in behavior. Deterrent devices should be strictly regulated as to ensure the safety of potential predators and other wildlife. Killing or harming any marine mammal or other predator should be prohibited, except when human safety is immediately threatened.
- Nutrient pollution: Direct, indirect, and cumulative effects of nutrient pollution surrounding the facility must be mitigated. Water quality monitoring, including nutrient loading and benthic impacts, should be required on a regular basis, and that information should be provided to the regulating authority and available for public review on a regular basis.
- Socioeconomic effects: Operators should not unreasonably interfere with fishing or other uses. Facilities should also be managed in a way that is consistent with any Fisheries Management Plan or Management Councils that have jurisdiction in the area.
- Accountability: Regulations must ensure that liability for any natural resource damages are solely borne by the facility operator. Operators should be strictly liable for all damages including, but not limited to, reimbursement for any costs for natural resource damage assessment, and remediation efforts.
- Cumulative impacts: An aquaculture facility shall not have significant adverse cumulative impacts, such as the gradual degradation of surrounding ecosystems or water quality over time.
- Siting: Offshore aquaculture facilities must be properly sited to avoid disrupting migration patterns, to minimize impact on the ecosystem, to avoid sensitive areas, and to protect human health.

ENDNOTES

- ¹ FOOD AND AGRIC. ORG. OF THE UNITED NATIONS, Fisheries and Aquaculture Department, *The State of World Fisheries and Aquaculture 2008*, iii; note 1 at 3; TC/M/I0250/E (2009) [hereinafter *The State of World Fisheries and Aquaculture 2008*].
- ² FOOD AND AGRIC. ORG. OF THE UNITED NATIONS, Fisheries Department, *The State of World Aquaculture 2006*, 53 TC/M/A0874/E (2006) [hereinafter *The State of World Aquaculture 2006*]. For a more specific example of how salmon aquaculture has resulted in adverse impacts on wild salmonids, see Jennifer S. Ford & Ransom S. Myers, *A Global Assessment of Salmon Aquaculture Impacts on Wild Salmonids*. 6(2) PLoS Biol 0411, 0411-17 (2008).
- ³ Rosamond L. Naylor et al. *Effects of Aquaculture of World Fish Supplies*, available at <http://www.epa.gov/watertrain/pdf/issue8.pdf>
- ⁴ *The State of World Aquaculture 2006*, *Supra* note 3 at 60-1. See also Hubbs-Seaworld Research Inst., *Aquaculture Issues 1* (2008). Nat'l Oceanic and Atmospheric Admin., NOAA – USDA Alternative Feeds Initiative (2008), <http://aquaculture.noaa.gov/news/feeds.html#background>.
- ⁵ Letter from Lisa Reinhalter, Policy Analyst, Food and Water Watch, to the Nat'l Oceanic and Atmospheric Admin. (Feb. 29, 2008) (on file with the Nat'l Oceanic and Atmospheric Administration), available at http://aquaculture.noaa.gov/pdf/comment_pdf/reinhalter.pdf.
- ⁶ Food and Agric. Org. of the United Nations, *FAO Fisheries & Aquaculture – Aquaculture & the Environment* (2005) <http://www.fao.org/fishery/topic/14894/en>.
- ⁷ For the purposes of this statement, “offshore aquaculture” refers to any operation for the purposes of harvesting marine species in the exclusive economic zone consistent with the proposed National Sustainable Offshore Aquaculture Act of 2009. H.R.4363, 111th Cong. (2009).
- ⁸ Food and Agric. Org. of the United Nations, *FAO Fisheries & Aquaculture – Introduction of Species* (2005) <http://www.fao.org/fishery/topic/13532/en>. See also Food and Agric. Org. of the United Nations, *FAO Fisheries & Aquaculture – Aquaculture & Biodiversity* (2005) <http://www.fao.org/fishery/topic/14853/en>. OCEAN CONSERVANCY, A Precautionary Approach to U.S. Open-Ocean Aquaculture, FOOD AND WATER WATCH, The Hubbs-SeaWorld Aquaculture Project: A Raw Deal (2009).
- ⁹ See also *The State of World Fisheries and Aquaculture 2008*, *supra* note 1 at 22.
- ¹⁰ NAT'L OCEANIC AND ATMOSPHERIC ADMIN, *Aquaculture, Marine Mammals, and Marine Turtles Interaction Workshop*, 1, NMFS-OPR-16 (Katie Moore & Donna Weiting eds., 1999)
- ¹¹ Rebecca J. Goldberg et al., *Marine Aquaculture in the United States* (2001) http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Protecting_ocean_life/env_pew_oceans_aquaculture.pdf
- ¹² See Interim Guide to Information Requirements for Environmental Assessment of Marine Finfish Aquaculture Projects, Canada's Dept. of Fisheries and Oceans, <http://www.dfo-mpo.gc.ca/aquaculture/ref/AAPceaafin-eng.htm>
- ¹³ National Oceanic and Atmospheric Admin., *NOAA Aquaculture Program: Aquaculture in the U.S.*, <http://aquaculture.noaa.gov/us/welcome.html> (2010).
- ¹⁴ *The State of World Fisheries and Aquaculture 2008*, *supra* note 1 at 79.
- ¹⁵ National Oceanic and Atmospheric Admin., *supra* note 12.
- ¹⁶ California Sustainable Oceans Act,
- ¹⁷ National Sustainable Offshore Aquaculture Act of 2009. H.R.4363, 111th Cong. (2009). Research in Aquaculture Opportunity and Responsibility Act of 2010. S.3417, 111th cong. (2010). National Oceanic and Atmospheric Administration, NOAA Aquaculture Program: Priorities (2009) <http://aquaculture.noaa.gov/about/priorities.html#1>.
- ¹⁸ HUBBS-SEAWORLD RESEARCH INSTITUTE, *Final Report: Offshore Aquaculture Demonstration Project*, 1 (2008).
- ¹⁹ This list is intended to be illustrative, but not comprehensive.