SHELLFISH AND SEAWEED AQUACULTURE PROGRAM

SECOND DISCUSSION DRAFT

MAY 1, 2026

PREPARED BY
DUDEK

PORT of SAN DIEGO
Waterfront of Opportunity

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SHELLFISH AND SEAWEED AQUACULTURE PROGRAM

SAN DIEGO UNIFIED PORT DISTRICT

SECOND DISCUSSION DRAFT

PORT of SAN DIEGO
Waterfront of Opportunity

2026 Board of Port Commissioners

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Second Discussion Draft
May 1, 2026
A Note to Reviewers

The San Diego Unified Port District (District) is pleased to release the second version of the Discussion Draft (Second Discussion Draft) of the proposed Shellfish and Seaweed Aquaculture Program (SSAP or program), which will support and facilitate the development of shellfish and seaweed aquaculture in and around San Diego Bay. This Second Discussion Draft represents the latest version of the SSAP as the District envisions it today. At this stage, as with the First Discussion Draft (released on August 20, 2024), stakeholder feedback is an important component to the successful development of this program. The purpose of the Second Discussion Draft is to continue communication between stakeholders and the District so that we can further refine our understanding of how the program is aligned with stakeholder priorities, the amount of support for the program, and if there are opportunities for improvement and further consideration. Seeking and incorporating public and stakeholder review and input throughout this process ensures that the SSAP benefits from broad-based expertise and varied perspectives, as well as being comprehensive and based on the most relevant scientific research, data, farming techniques, and regulatory and policy frameworks.

We want to express gratitude to those who submitted comments during the first public review period. In this Second Discussion Draft, we have incorporated feedback received from the 60-day public review period that took place from August 20, 2024, to October 25, 2024. In total, we received 20 comment letters from stakeholders, including agencies, organizations, and individuals, expressing support for the program and providing comments to help improve the document encompassing themes such as environmental interactions, shared ocean uses, and economic impact. This version has been revised to reflect this written feedback, as well as feedback received during stakeholder engagement discussions. Notably, revisions include updates to maps of potential in-water locations to address conflicts between future shellfish and seaweed aquaculture locations and existing marine uses such as military

operations, recreational boating, surfing, recreational fishing, commercial fishing, and other bay users. Additionally, we have revised the document to more clearly explain the environmental benefits and potential economic opportunities provided by the SSAP.

The District appreciates the thoughtful input received from stakeholders regarding potential alternative locations in South San Diego Bay near the Former A-8 Anchorage and along the northwest shore of Coronado (North Island) for shellfish and seaweed aquaculture (**see Figure ES1**). These suggestions were carefully reviewed and prompted a series of additional detailed technical and spatial analyses, including a deeper review of submerged aquatic vegetation, shoreline orthoimagery, bathymetric data, oceanographic data, wave height, vessel traffic, and recreational activity. While stakeholder input contributed to refinements of the proposed sites, the District determined that the additional locations suggested are not presently available for use due to operational and use-compatibility limitations. The locations presented in this Discussion Draft represent those that remain the most likely candidates for inclusion in the SSAP.

We welcome feedback on this Second Discussion Draft from all stakeholders and members of the public, including input on benefits or impacts that may result from shellfish and seaweed aquaculture, potential issues or concerns that may result from the proposed concepts, suggestions for additional in-water or landside locations to consider, or any additional data or information that you would like us to consider.

This is one of several opportunities to provide input on the SSAP. Following circulation of this Second Discussion Draft, the District will continue to engage with agencies, stakeholders, Native American tribes, and the general public as the SSAP continues to be developed, and there will be additional opportunities for future engagement on the SSAP, including public comment during environmental review. District staff will continue to prioritize opportunities to meet with interested parties during this process, which is designed to be iterative and responsive to feedback. The District's ongoing stakeholder outreach on this program will also, by necessity, evolve as the SSAP evolves, with the overarching goal of inclusive and comprehensive engagement continuing to drive decision making.

We look forward to receiving and reviewing your comments throughout this comment period. As this is the first time the District has worked to establish a program of this type, comments from stakeholders and the public at large are essential to ensuring we have as much information as possible to make informed and thoughtfully considered recommendations to the Board of Port Commissioners during the decision-making process. For that reason, the District very much appreciates your time and effort. Comments on this document will be accepted through June 15, 2026. Please submit your comments to SSAP@portofsandiego.org. Thank you.

Executive Summary

San Diego Bay and surrounding areas have several characteristics supportive of shellfish and seaweed aquaculture, including a temperate climate, proximity to markets, and existing shore-side infrastructure. Shellfish and seaweed aquaculture have the potential to provide sustainable commercial opportunities in multiple areas, including food production, biofuel, bioplastics, and other alternative materials. When properly planned and managed, shellfish and seaweed aquaculture can co-exist with other maritime functions and provide many benefits such as improving water quality, providing habitat enhancement, increasing carbon sequestration, and facilitating ecosystem restoration. San Diego can support viable shellfish and seaweed aquaculture businesses that also align with the District's mission, advance science, and grow a new industry sector with strong potential for job creation and related economic and environmental benefits for the region.

The District is proposing the Shellfish and Seaweed Aquaculture Program (SSAP) to support and facilitate the development of shellfish and seaweed aquaculture in and around San Diego Bay. The SSAP provides a framework for the District to guide and approve future shellfish and seaweed aquaculture activities through the program. The SSAP is a proposed set of policies, procedures and best practices that the District would apply when considering specific aquaculture projects.

The goals of the SSAP include:

Leveraging the District's unique role as a port and government partner to:

- Create new opportunities to complement maritime uses and diversify the District's portfolio of sustainable, ocean-based business lines
- Balance existing and emerging military, maritime, recreational, and blue economy industries to promote prosperous working seascapes
- Explore sustainable use of ocean space while enhancing surrounding marine ecology

Proposed future operations for the growing of shellfish and/or seaweed in and around San Diego Bay would need to be reviewed for consistency with the objectives of the SSAP and regulated to minimize environmental effects, seek co-benefits, and maximize sustainable production. Through the SSAP, the District will require that aquaculture farms and facilities meet compliance and environmental standards, including permit requirements. To that end, the SSAP encourages methods, species, equipment, and practices that are commonly used and generally accepted within the aquaculture industry.

SSAP LOCATIONS *(see Figure ES1)*

The SSAP identifies three in-water locations and three landside locations where shellfish and seaweed aquaculture activities could occur.

UPDATED IN-WATER LOCATIONS:

- up to **152 acres** of open ocean areas west of **Imperial Beach;**
- up to **80 acres** west of the National City Marine Terminal formally designated as the **Former A-8 Anchorage;** and
- up to **598 acres** of nearshore open-ocean area, currently outside of the District's jurisdiction, known as **Zuñiga Shoals,** south of **Zuñiga Jetty.**

INITIAL LANDSIDE LOCATIONS:

- existing infrastructure at **CP Kelco**, located on the eastern shore of the Bay, southeast of the Coronado Bridge;
- a gravel lot adjacent to, and outside the **Tenth Avenue Marine Terminal**; and
- a warehouse (currently vacant) at the **National Distribution Center**, located just east of the National City Marine Terminal and Pasha Automotive Services.

Note that while the SSAP identifies the above areas as potentially suitable for aquaculture, any aquaculture uses proposed for such areas are still subject to other permitting and approval requirements discussed in the SSAP.

Potential Sites for Shellfish and Seaweed Aquaculture Program (SSAP)

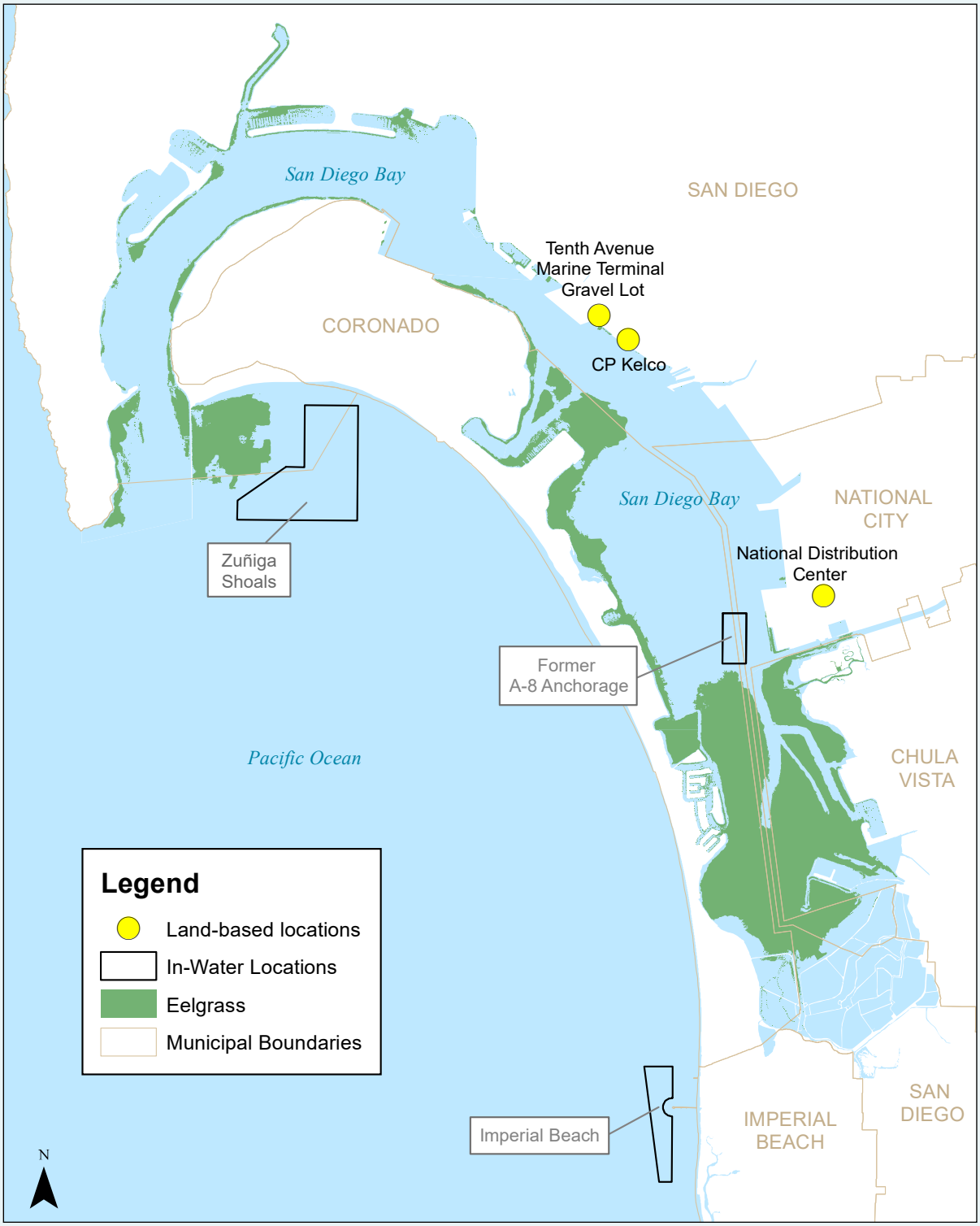

Figure ES1. Proposed initial in-water and landside locations for the Shellfish and Seaweed Aquaculture Program.

Figure ES2. Some examples of mussel and kelp longline cultures.

Species proposed for the SSAP are native or naturalized to the San Diego region and include:

- Shellfish: mussels, oysters, and scallops
- Seaweed: brown (kelp), and red and green seaweed

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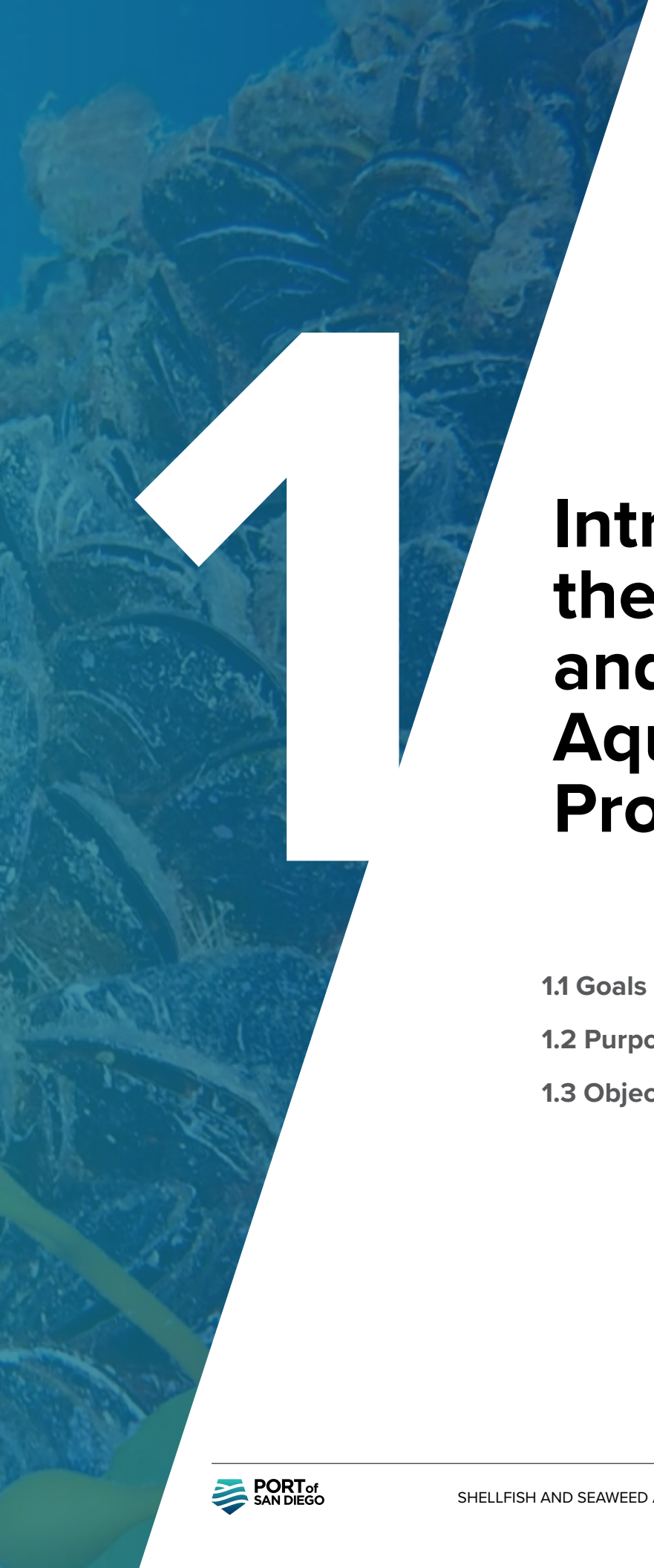
- **Shellfish:** mussels, oysters, and scallops
- **Seaweed:** brown (kelp), and red and green seaweed

Each of these species may rely upon different gear types or configurations, harvesting techniques, and regulatory or permitting requirements. In addition, the District anticipates that future aquaculture operators may propose operations where shellfish and seaweed species would be grown within the same footprint. As research and technology advance, new species or gear types and configurations may be considered as part of the SSAP, either through a program update or an individual operator's proposal. Any future additions to the SSAP must be consistent with the program's overall established intent, objectives, standards, and requirements. Only shellfish and seaweed species are included in the SSAP **(i.e., Finfish aquaculture is not a part of the SSAP).**

Implementation of the SSAP would be guided by its program objectives and each individual SSAP operation would be administered by a site-specific operations plan.



1 Introduction to the Shellfish and Seaweed Aquaculture Program (SSAP)

1 Introduction to the Shellfish and Seaweed Aquaculture Program (SSAP)

1.1 Goals

The goals of the SSAP include:

Leveraging the District's unique role as a port and government partner to:

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- Balance existing and emerging military, maritime, recreational, and blue economy industries to promote prosperous working seascapes
- Explore sustainable use of ocean space while enhancing surrounding marine ecology

1.2 Purpose

The District is proposing the SSAP to support and facilitate the development of shellfish and seaweed aquaculture in and around San Diego Bay (or Bay). The SSAP provides a framework for the District to guide and approve future shellfish and seaweed aquaculture activities through the program. The SSAP is a proposed set of policies, procedures and best practices that the District would apply when considering specific aquaculture projects.

Under the SSAP, proposed operations for the growing of shellfish and/or seaweed in and around San Diego Bay would be reviewed for consistency with the objectives of the SSAP and regulated to minimize environmental effects, seek co-benefits, and maximize sustainable production. Through the SSAP, the District would require that aquaculture farms and facilities maintain compliance with environmental standards and permitting requirements. To that end, the SSAP will align with commonly used or generally accepted practices within the aquaculture industry, including methods and use of equipment, which may be amended over time as technology and practices advance.

1.3 Objectives of the SSAP

- Support growth of the regional blue economy through opportunities for new businesses and employment within the shellfish and seaweed sector.
- Develop and implement a fair, timely, and transparent permitting and entitlement process for shellfish and seaweed aquaculture projects in and around San Diego Bay.
- Provide opportunities for the renewal and expansion of maritime uses in and around the Bay, including shellfish and seaweed processing operations.
- Support shellfish and seaweed projects that can provide environmental benefits, such as habitat enhancement, nutrient uptake or filtration, enhancement of native fish populations, and other ecosystem services (e.g., bioremediation, coastal resilience, and reduce accumulation of marine debris), to the surrounding San Diego Bay ecosystem, and facilitate studies to monitor and quantify such benefits.
- Support existing and future aquaculture industries by removing barriers to entry and diversify the industry in San Diego by conducting program-level analysis of specific sites and associated environmental review to improve efficiency of future project-specific analysis for potential individual aquaculture operations proposed through the SSAP.
- Identify performance standards and best management practices that would be employed by future aquaculture projects to minimize potential negative environmental impacts and use conflicts associated with shellfish and seaweed aquaculture cultivation, which may be amended over time as technology and practices advance.
- Enhance public knowledge and understanding of sustainable shellfish and seaweed farming practices and promote community collaboration and connection to the water.
- Advance knowledge and innovation through scientific and environmental research and development related to shellfish and seaweed operations, including research on climate-resiliency solutions such as carbon sequestration.

Targeting shellfish and seaweed for farming operations aligns with the SSAP's goals and presents unique opportunities to complement the established sustainable seafood sector. These activities can enhance collaboration across the ocean production industry, leveraging shared infrastructure and resources to strengthen both aquaculture and wild harvest fisheries (Halpern & Selkoe, 2024).

2 Background

2 Background

2.1 Shellfish and Seaweed Aquaculture

Shellfish, specifically bivalves such as mussels, clams, and oysters, and seaweeds consume food and uptake nutrients naturally occurring within the water column without the input of additional food, vitamins, additives, fertilizer, or freshwater. While shellfish and seaweed can be harvested from the wild, increasing demand for consistent high-quality shellfish and seaweed has resulted in a significant increase in the cultivation of these products through aquaculture. As California considers the resource costs associated with food production (e.g., limited freshwater and carbon footprint), shellfish aquaculture can offer a sustainable alternative to land-based protein production. Shellfish are excellent sources of protein with essential amino acids and contain vitamins such as iron, zinc, magnesium, B12, and omega-3 fatty acids. There is also a developing market for seaweed food products. In addition to being sources of fiber, protein, and essential fatty acids, seaweed contains up to ten times more vitamins and minerals - such as magnesium, calcium, iron, and iodine - than green leafy vegetables (FoodData Central).

Section 30100.2 of the California Coastal Act refers to Section 17 of the Fish and Game Code for the definition of "aquaculture." The SSAP relies upon this Fish and Game Code definition, as interpreted by the California Department of Fish and Wildlife:

> **"Aquaculture"** means that form of agriculture devoted to the propagation, cultivation, maintenance, and harvesting of aquatic plants and animals in marine, brackish, and fresh water. "Aquaculture" does not include species of ornamental marine or freshwater plants and animals not utilized for human consumption or bait purposes that are maintained in closed systems for personal, pet industry, or hobby purposes, however, these species continue to be regulated under Chapter 2 (commencing with Section 2116) of Division 3 of the Fish and Game Code.

The SSAP does not include any fish species (finfish) for aquaculture.

The United States (U.S.) is the world's largest importer of seafood. On average, up to 65% of the seafood consumed annually in the U.S. is imported. Farmed seafood products already make up over half of the world's seafood supply, but U.S. production lags behind much of the world, leading to a $20.3 billion seafood deficit in the U. S. in 2023 (Gephart et al., 2019; NMFS, 2024).

Marine aquaculture provides a domestic source of economically and environmentally sustainable seafood that complements and supports our wild fisheries production, fostering opportunities for collaboration and resource-sharing to enhance the seafood and ocean production industry (Mansfield et al., 2024). According to the latest science, up to 38% of seafood consumed in the U.S. is produced domestically (Gephart et al., 2019), with aquaculture currently accounting for only 7% (NMFS, 2024). Expanding domestic seafood production though shellfish and seaweed aquaculture adds value to locally harvested wild-caught seafood by enhancing diversity and reliability of seafood supply, which in turn helps to preserve working waterfronts, markets, culinary traditions, and jobs, and allows for a continuous supply of reliable, nutritious, and sustainable food sources (Halpern & Selkoe, 2024).

In addition to commercial food production, which includes products for human consumption, stabilizing agents, supplements, and animal feed, shellfish and seaweed aquaculture can provide valuable ecosystem services and additional economic benefits, such as:

- **bioremediation** to improve water quality via the absorption of contaminants or filtration of water, such as excess nitrogen from on-land runoff (Gentry et al., 2020)
- **fisheries enhancement** by providing habitat restoration, foraging opportunities, and refuge for local fishery species (Theuerkauf et al., 2021)
- **carbon sequestration** by storing atmospheric carbon in seaweed tissue and bivalve shells (Jones et al., 2022; Alleway et al., 2023)
- **improved climate resiliency and shoreline protection** by attenuating wave energy and storm surge (Alleway et al., 2023)
- **near-zero input farming** that requires no feed, freshwater, or land and results in minimal emissions by providing locally sourced food and materials (The Nature Conservancy, 2023)
- **non-consumptive products** including alternative biofuels, bioplastics, textiles, building materials, fertilizers, and biostimulants (Stirk et al., 2020; Camer-Pesci et al., 2023)
- **opportunities for employment and economic development** by providing new jobs and complementing existing industries within local working waterfronts (Kumar et al., 2024; NADP, 2024)
- **environmental protection** through the active management of marine areas and the promotion of ocean stewardship, safeguarding sensitive habitats and limiting the accumulation of harmful marine debris.

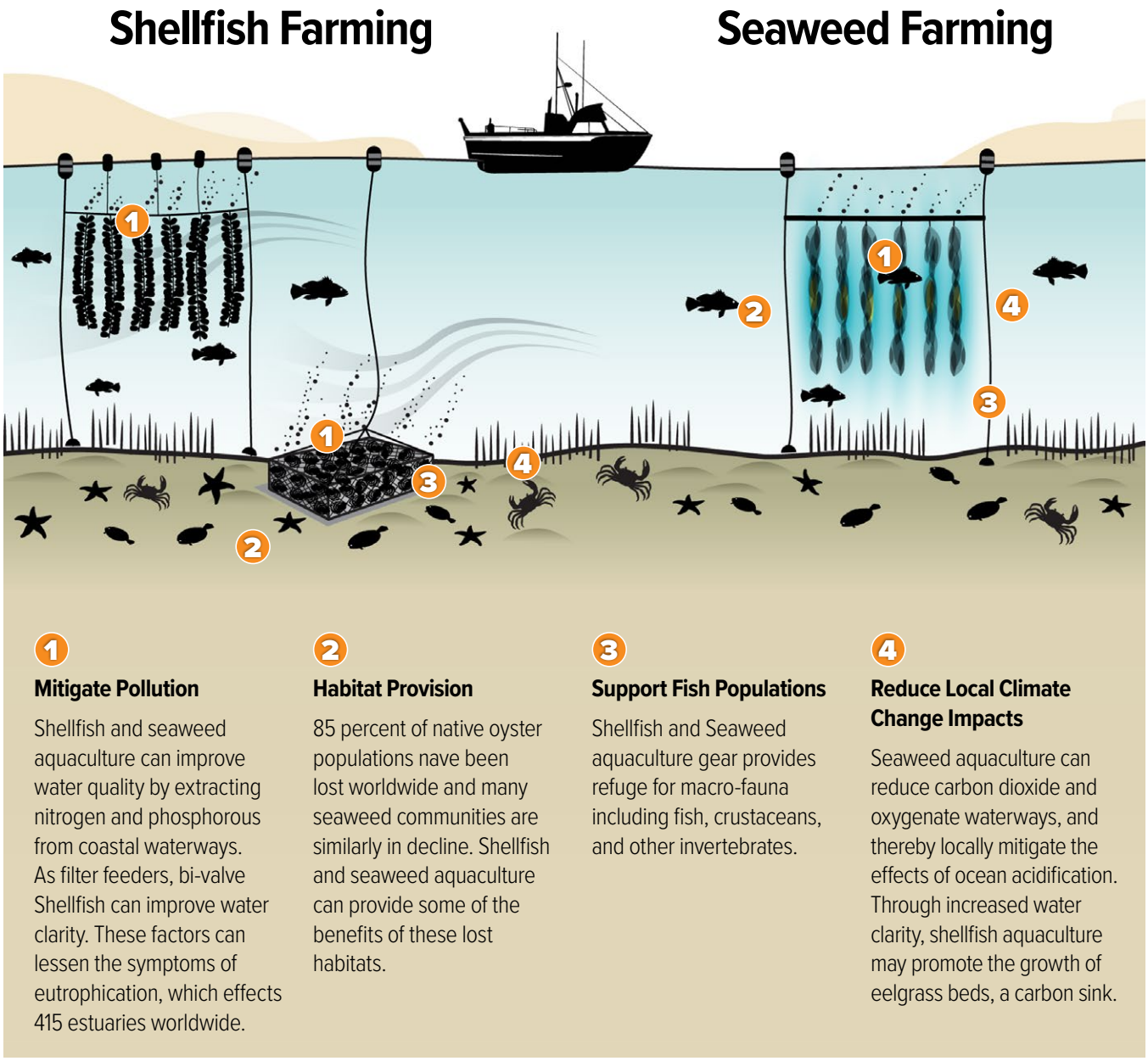


Figure 1. Some of the environmental benefits of shellfish and seaweed aquaculture. (The Nature Conservancy)

Shellfish aquaculture in the U.S. generates approximately $300 million annually (NMFS, 2024). The global commercial seaweed market size was valued at $72.3 billion in 2025 and is expected to expand at a compound annual growth rate of 6.9% from 2025 to 2035 (Global Market Insights, 2025). Current market analyses project that new and emerging markets will grow by an additional $11.8 billion by 2030, and harvesting and processing capacity will quadruple by 2035 to meet expected market demand. (World Bank, 2023; Piconi et al., 2020).

2.2 Shellfish and Seaweed Aquaculture in California

California's shellfish and seaweed aquaculture industry consists of 21 commercial operators in both state coastal waters and private land-based facilities. In 2023, the farm-gate commercial value of California's shellfish aquaculture had an estimated value of $36.6 million, which does not include indirect economic benefits like jobs or other supporting industries (Wright et al., 2025). The most commonly cultured species of shellfish in the state grown for consumption include Pacific oysters (*Crassostrea gigas*), Kumamoto oysters (*Crassostrea sikamea*), Manila clams (*Venerupis philippinarum*), Mediterranean mussels (*Mytilus galloprovincialis*), and red abalone (*Haliotis rufescens*) (CDFW, 2020). California's seaweed production is currently nascent, with only six commercial operators (Wright et al., 2025), but there is growing interest among state and federal agencies, venture capitalists, entrepreneurs, and culinary professionals to expand opportunities, for both consumptive and non-consumptive uses. To evaluate the economic viability of the future seaweed industry in California, there are significant market opportunities and supply chain elements to consider. Small farms currently produce seaweed such as Ogo (*Gracilaria spp.*), Sea Lettuce (*Ulva spp.*), and Dulse (*Palmaria palmata*), primarily for human consumption, sold fresh or dried to high-end restaurants, specialty shops, and farmers markets (Considine et al. 2023). Unfortunately, small scale production will not be able to meet future projected demands as they evolve to include commercial products such as biostimulants, animal feed additives, and nutraceuticals, which require a significantly greater volume of seaweed to be commercially viable (World Bank, 2023). The establishment of more farms able to scale accordingly, along with concurrent expansion of upstream (e.g. hatcheries) and downstream (e.g. processing and refinement) infrastructure are necessary to keep pace and take advantage of untapped economic growth potential.

The demand for California-grown shellfish and seaweed is unmet; however, California has not issued a new State lease for shellfish farming since 1993 and has only issued one experimental State lease for seaweed. According to the Report on California Aquaculture (CEA Consulting, 2022), "the timeframe for receiving permits and authorizations (in California) varies from two to ten years." As discussed in **Section 4. Regulatory Framework,** the federal and state permitting process for aquaculture projects is complex, requiring review and approval from numerous regulatory agencies. There are also several points during the permitting and environmental review process when legal or project challenges can occur, adding more costs and complexity, lengthening the permitting timeline, and resulting in uncertainty for project applicants. This complex and lengthy permitting process can result in very significant permitting costs even before a company can install, plant, and operate an aquaculture farm, which has had the effect of dissuading many small and emerging aquaculture businesses from entering the industry in California, thereby reducing the diversity and variety of businesses that currently operate in the state aquaculture industry in comparison to other states. The length and unpredictability of the current permitting pathway also makes it difficult for businesses to secure loans and funding.

Figure 2. Locations of shellfish and seaweed aquaculture operations in California, as of 2024.

The Western Regional Aquaculture Center (van Senten et al., 2020) calculated the average regulatory cost for west coast shellfish farms to be over $240,000 (over $171,000 per farm in Washington State and over $470,000 in California) with approximately $141,000 related to obtaining permits ($109,000 in WA, $261,000 in CA) and the remaining to satisfy annual compliance obligations required by the permits ($62,000 in WA and $211,000 in CA). The research indicated that the actual cost of permits and licenses themselves are only 7.1% of obtaining permit costs. In CA that number is 2.5% and in WA it's 11%. **The greatest regulatory cost per farm were indirect costs such as legal fees and consultants.**

3 Shellfish and Seaweed Aquaculture in San Diego

3.1 The Port of San Diego's Unique Role

3 Shellfish and Seaweed Aquaculture in San Diego

There are several competitive advantages for growing shellfish and seaweed in and around San Diego Bay, including:

- **Climate:** The region's warm, year-round climate and nutrient-rich water.
- **Species selection:** Species evaluated for inclusion in the SSAP are local, commercially available, and grow well in the region.
- **Proximity to markets:** Population centers in Southern California and along the west coast provide strong consumer demand for shellfish and seaweed. Additionally, given the State's increasing interest in nature-based solutions and alternatives to resource-intensive production, shellfish and seaweed cultivation have the potential to be applied in a variety of areas, including bioremediation, carbon sequestration, protection of coastal habitats and infrastructure, as well as the production of a range of other potential products including seaweed-based biofuels, biostimulants, fertilizers, stabilizing agents, human food supplements, and livestock feed additives.

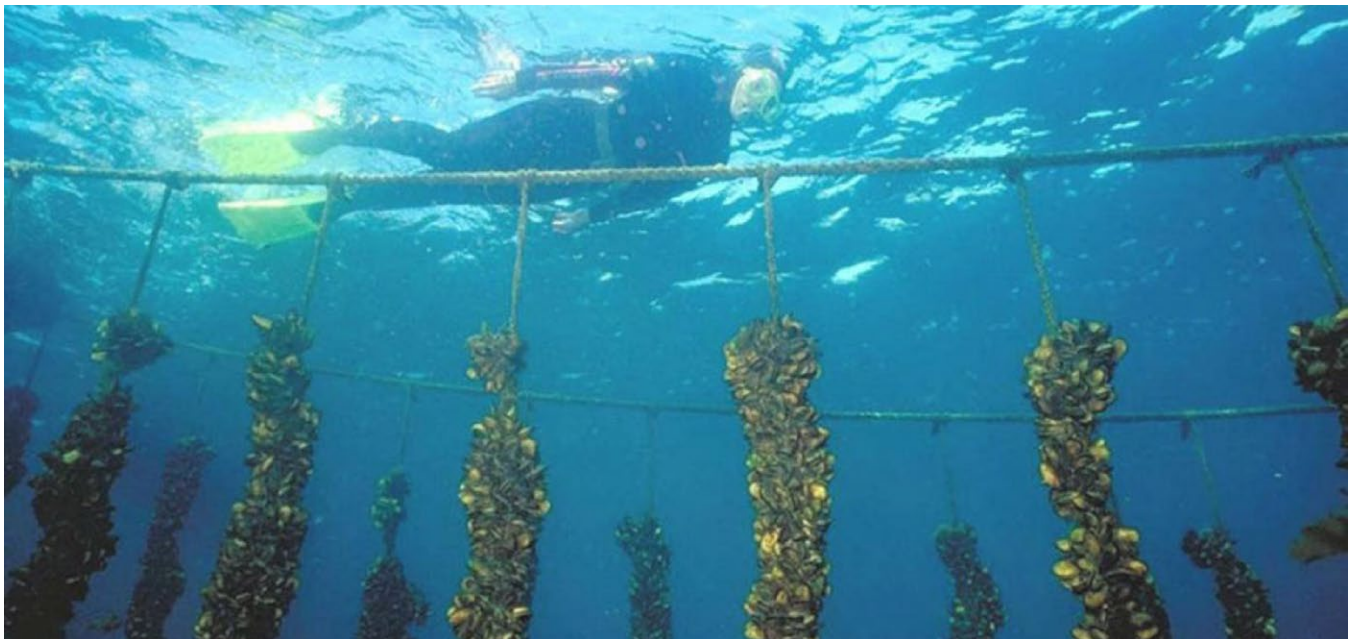
3.1 The Port of San Diego's Unique Role

Ports can and are increasingly playing a critical role in the development of sustainable aquaculture opportunities, given their familiarity and expertise in the permitting and entitlements process for a variety of coastal and ocean uses, the unique role they often play as landlord, operator and/or regulator, and as champions of the blue economy. As manager of the Tidelands Trust, the District is a long-time champion and catalyst of San Diego's blue economy and continues to explore new business opportunities to diversify its portfolio and strengthen its collective economic impact. By making District assets including water and land areas available for shellfish and seaweed aquaculture, the District can further diversify maritime industries in the San Diego regional blue economy ecosystem, while expanding sources of locally sourced and sustainable seafood and aquatic products. For example, the District's SSAP is intended to work synergistically with the existing commercial fishing industry by developing commonly needed infrastructure (i.e., space for landing, processing, and storage) and supporting skilled labor that can assist both aquaculture and wild-caught fisheries.

Figure 3. Some of the established and emerging industries in the blue economy in San Diego.

The District plays many roles in and around San Diego Bay, such as an operator of maritime assets, a regulator, a landlord, and an environmental steward. As a landlord, the District can issue short- or long-term real estate agreements with tenants for the use of Tidelands. These agreements must be issued consistent with Board of Port Commissioners (BPC) Policy No. 355 – Real Estate Leasing Policy. Determination of compensation, qualifications of prospective tenants, amendments, transaction processing and option terms are detailed in BPC 355 and the associated Administrative Practices – Real Estate Leasing.

With the District's knowledge and proficiency as an asset and land manager, including enforcement and regulatory functions, the District can provide significant resources to address the major barriers to entry for shellfish and seaweed operations. Prior to approval and implementation, the SSAP would undergo programmatic environmental review pursuant to the California Environmental Quality Act (CEQA). The programmatic environmental review would analyze the anticipated environmental impacts associated with the aquaculture species, gear, and operations anticipated at the locations identified in the SSAP, which could be further refined through supplemental environmental analysis for specific applications. It is anticipated that this can significantly reduce the cost associated with environmental review for individual



applicants and provide a more streamlined entitlement experience for future individual shellfish and seaweed proposals under the SSAP, through incorporating operational guidance, applicable mitigation measures, and relevant data from special studies. This approach could provide a more predictable and cost-effective process for future aquaculture operators, particularly small companies and those trying to enter the industry, who may not have the financial resources to navigate the extensive environmental review and permitting process needed to establish an aquaculture farm without some assistance. By reducing the costs and time associated with permitting efforts, which have been identified as the most significant barrier to the expansion of aquaculture in California, this approach may facilitate and support growth of the aquaculture industry in the state.

The SSAP supports the District's mission by introducing and encouraging shellfish and seaweed aquaculture operations as a new maritime industry to the San Diego region. There is unrealized potential for these activities to improve economic vitality by bringing new businesses and jobs to the region; create community benefits through local food production; and provide environmental stewardship by enhancing the regional marine ecology.

The District's mission: "Protect the Tidelands Trust resources by providing economic vitality and community benefit through a balanced approach to the maritime industry, tourism, water and land recreation, environmental stewardship, and public safety."

4 Regulatory Framework

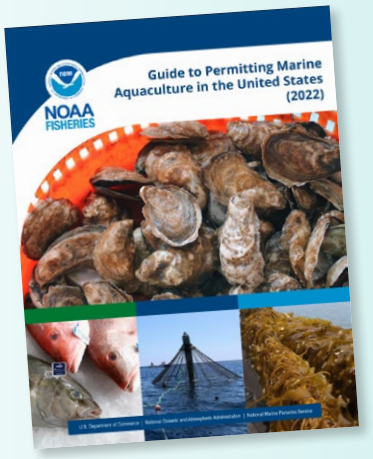
4 Regulatory Framework

The District is committed to coordinating with state and federal regulatory agencies as it develops the SSAP. The state and federal regulations related to shellfish and seaweed aquaculture consider more than the physical location of the activity. There are a suite of legislative actions, policies, and regulatory statutes that provide a framework for evaluating aquaculture. These are in place to address foreseeable issues with new or enhanced aquaculture operations, including but not limited to: potential conflicts with other uses (e.g., military, fishing, recreation, and navigation); proximity to, and interaction with, critical species and sensitive habitats; water quality within the growing area, and processing elements to support human consumption and/or product manufacturing.

While the specific permits required for a shellfish or seaweed aquaculture project will ultimately depend on the nature of the proposed operation, below is a general summary of the permits and approvals that are likely to be necessary for most aquaculture projects anticipated as a part of the SSAP in San Diego Bay and the surrounding areas.

4.1 Primary Federal Permits or Verifications

- **U.S. Army Corps of Engineers (USACE)** maintains jurisdiction of U.S. navigable water under Section 10 of the River and Harbors Act of 1899 and § 401 and 404 of the Clean Water Act to protect navigation for commerce, ensure protection of water quality, and regulate discharge of dredged or fill material. In certain cases, the USACE may need to conduct environmental review under the National Environmental Policy Act (NEPA). Permits issued by the USACE are considered "federal actions" and associated applications must be reviewed in consultation with the National Oceanographic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service for compliance with the Endangered Species Act and Marine Mammal Protection Act.
- **NOAA NMFS** maintains jurisdiction under the Magnuson-Stevens Fishery Conservation and Management Act (MSA)



Guide to Permitting Marine Aquaculture

In 2022, NOAA published, in consultation with the Subcommittee on Aquaculture (SCA) and National Science and Technology Council, the Guide to Permitting Marine Aquaculture in the United States. This document provides a listing of state and federal agencies involved in aquaculture permitting and operations and details the federal permitting process.

to ensure activities and operations relating to the catching, taking, or harvesting species comply with the MSA.

4.2 Additional Federal Authorizations and Agencies

- **U.S. Coast Guard –** ensures safe navigation and authorizes private aid to navigation.
- **U.S. Department of Defense –** provides the military forces needed to deter war and to protect the security of the United States.
- **U.S. Department of Agriculture Animal and Plant Health Inspection Services (USDA APHIS) –** maintains authority over the prevention, detection, control, and eradication of animal diseases, including aquaculture.
- **U.S. Food and Drug Administration (FDA) –** exerts jurisdiction when shellfish and seaweed are produced with the intention of being available for human consumption.
- **Seafood Hazard Analysis and Critical Control Point Regulation (HACCP) –** applies to processors of fish and fishery products for human food and is implemented through a system of preventative controls to reduce hazards associated with their processes and products.
- **National Shellfish Sanitation Program (NSSP) –** is regulated through the Interstate Shellfish Sanitation Conference (ISSC) which is a Federal/State cooperative effort between FDA, NOAA, Environmental Protection Agency (EPA), state shellfish sanitations programs (i.e., CA Department of Public Health), academia, tribes, and the shellfish industry. The ISSC ensures that all molluscan shellfish (mussels, clams, scallops, and oysters) sold raw (live, fresh, or fresh frozen) are grown in, and harvested from, approved shellfish growing areas, handled by state-certified dealers, appropriately tagged, and tracked, and processed in plants that meet NSSP requirements.
- **The Food Safety Modernization Act (FSMA) –** regulates aquaculture operations that manufacture, process, pack or hold human food.

4.3 Federal Consultation and Review

Permits issued by the USACE are considered "federal actions" and associated applications must be reviewed in consultation with NMFS and U.S. Fish and Wildlife Service, often referred to as "the services". The following laws are commonly part of a consultation for aquaculture projects: Endangered Species Act, Essential Fish Habitat (under MSA), NEPA, Marine Mammal Protection Act, Fish and Wildlife Coordination Act, National Historical Preservation Act, Coastal Zone Management Act, National Aquaculture Health Plan and Standards, and the National Marine Sanctuary Resources Act.

4.4 National Policies in Support of Aquaculture

As early as the National Aquaculture Act (1980), NOAA began focusing attention towards facilitating domestic aquaculture. The National Marine Aquaculture Policy issued in 2011 recognized that aquaculture is important for nutrition, local jobs and, when combined with wild capture fisheries, is a climate-ready food system that helps meet the growing demand for seafood.

In 2013, NOAA further expanded upon its support for aquaculture (NMFS, 2024)[1] through the National Shellfish Initiative. Also, in that year, the National Ocean Council issued the National Ocean Policy Implementation Plan, an element of which called for increased efficiencies in the permitting process and encouraged agency coordination to facilitate additional marine aquaculture development. Most recently, Executive Order (EO) 14276, Restoring American Seafood Competitiveness was issued April 2025, which expanded upon EO 13921, Promoting American Seafood Competitiveness and Economic Growth issued in 2021. NOAA's implementation of the Policy and Executive Orders are being carried out through the identification of Aquaculture Opportunity Areas, research funding, and various programs, and signals federal interest in and support of marine aquaculture. One of the two Aquaculture Opportunity Areas selected as being suitable for future development of aquaculture is in federal waters

1 NOAA defines aquaculture as "the breeding, rearing, and harvesting of animals and plants in all types of water environments" https://www.fisheries.noaa.gov/topic/aquaculture

of the Southern California Bight, offshore of Ventura and Santa Monica (NMFS, 2025).

4.5 The Subcommittee on Aquaculture (SCA)

The Subcommittee on Aquaculture (SCA) serves as the Federal interagency coordinating group to increase the overall effectiveness and productivity of Federal aquaculture research, regulation, technology transfer, and assistance programs. This interagency coordinating group which includes representation from USDA, NOAA, Fish and Wildlife Service, Office of Science and Technology Policy, Department of Defense, Department of Commerce, Environmental Protection Agency, and Department of Health and Human Services has been functioning since before the National Aquaculture Act was signed into law in 1980. In addition to the National Aquaculture Act, the group is also authorized through the National Aquaculture Improvement Act of 1985.

SCA operates through three distinct task forces under the guidance of the National Aquaculture Development Plan, which have focused efforts on three specific elements relating to aquaculture development in the United States.

- **Science Planning –** to document Federal science and technology opportunities and priorities for aquaculture by revising and updating the *National Strategic Plan for Aquaculture Research.*
- **Regulatory Efficiency –** through the creation of a national *Strategic Plan to Enhance Regulatory Efficiency in Aquaculture* that outlines actions Federal agencies plan to take within their existing statutory authorities and budgetary resources to improve the efficiency, predictability, and timeliness and reduce the costs of reviewing, approving, monitoring, and enforcing regulatory requirements for commercial marine aquaculture ventures.
- **Economic Development –** to supplement the above efforts and create a *Strategic Plan for Economic Development* through aquaculture.

4.6 Interagency Working Group for Farming Seaweeds and Seagrasses

The Interagency Working Group for Farming Seaweeds and Seagrasses is overseeing the development of a report focusing on the state of the science, growing considerations and methodology, and opportunities to advance collaboration with this sector both in the United States and abroad. The report, released in June of 2024 reviews the current understanding of research for farming seaweeds and seagrass and how seaweeds and seagrasses may (1) deacidify ocean environments, (2) become feedstocks in the agriculture sector, and (3) be used to develop novel products to support a Blue Economy.

4.7 State of California

The SSAP is intended to further the policies identified in California's Aquaculture Development Act (CA Public Resources Code, §§ 826-828), which encourages the practice of aquaculture to augment food supplies, expand employment, promote economic activity and protect and better use the land and water resources of the state, and Assembly Joint Resolution 43 (2014), wherein the State Legislature states its support "to protect existing shellfish beds and access to additional acreage for shellfish farming and restoration".

The Coastal Act defines development in Section 30106:

"Development" means, on land, in or under water, the placement or erection of any solid material or structure; discharge or disposal of any dredged material or of any gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining, or extraction of any materials; change in the density or intensity of use of land... change in the intensity of use of water, or of access thereto; construction, reconstruction, demolition, or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or harvesting of major vegetation other than for agricultural purposes, kelp harvesting, and timber operations which are in accordance with a timber harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 (commencing with Section 4511).

4.7.1 California Coastal Commission

Activities that meet the California Coastal Act's (Coastal Act) definition of "development" within California's Coastal Zone must be authorized through the issuance of a Coastal Act approval, such as a coastal development permit (CDP) issued by the California Coastal Commission (CCC) or a local government with a certified local coastal program (LCP) or PMP, unless the activity is specifically exempted from the permit requirements. Generally, aquaculture activities meet the definition of "development" and require review under the Coastal Act or a certified LCP or PMP. To aid aquaculture applicants in navigating the CDP application process and in response to California Senate Bill 262 (2019-2020)[2], the CCC developed the "Coastal Development Permit Application Guidance for Marine Aquaculture and Restoration," a non-regulatory guide aimed at streamlining CDP approvals while protecting coastal resources.

The Coastal Act supports the development of aquaculture within the Coastal Zone and establishes it as a priority use in certain cases. Section 30222.5 of the Coastal Act states: "Oceanfront land that is suitable for coastal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given that priority, except over other coastal dependent developments or uses." In addition, Section 30233 lists limited development types permitted within open coastal waters, wetlands, estuaries, and lakes, and in (a)(7) includes "Nature study, aquaculture, or similar resources dependent activities" as development that would be permitted in those areas."

2 California Senate Bill SB 262 (2019–2020) was authored by Senator Mike McGuire and signed into law on October 2, 2019 as Chapter 472, Statutes of 2019. The bill focuses on marine resources, specifically the regulation of commercial fishing and aquaculture operations in California. The bill aimed to modernize fee structures, support sustainable fisheries, and enhance oversight of aquaculture and commercial fishing operations in California.

For information about locations proposed in the SSAP that are not within the District's coastal permitting authority and would require a CDP from the CCC, please **see Section 12.1 and Section 12.2**

4.7.2 California Fish and Game Commission (Commission)

While the District may issue leases for areas within its jurisdiction, for areas currently outside its jurisdiction, such as the Zuñiga Shoals area, aquaculture leases are issued by the Commission on behalf of the State. Fish and Game Code §1700 declares a statewide policy to encourage the conservation, maintenance, and utilization of the ocean and waters under the jurisdiction of the state for the benefit of the state citizenry and development of fisheries, including commercial aquaculture. Additionally, Fish and Game Code § 15400 requires the Commission to make a Public Interest Determination prior to issuing a state water bottom lease for aquaculture purposes. The goals of the Public Interest Determination are to ensure that the issuance of state water bottom leases for aquaculture are in the public interest, which includes a review of compliance with regulatory requirements, evaluating the potential cultural, economic, and environmental impacts and associated benefits of the potential lease, and recommendation of appropriate best management practices. The analysis to support a determination by the Commission is structured around a series of criteria, divided into two categories:

- **"Requirements",** which list regulatory constraints on lease locations or activities identified by statute or regulation; and
- **"Considerations",** which include a suite of potential impacts, concerns, and potential benefits for the Fish and Game Commission to evaluate in deciding if public interest exists to issue the proposed aquaculture lease.

4.7.3 California Department of Fish and Wildlife (CDFW)

The California Aquaculture Development Act of 1979 provides state policy direction, finding and declaring the practice of aquaculture to be in the interest of the people of the state, and that it should be encouraged to augment food supplies, expand employment, promote economic activity, increase native fish stocks, enhance commercial and recreational fishing, and protect and better use the land and water resources of the state. It further established a policy and program toward improving the science and practice of aquaculture as a means of expanding the aquaculture industry and related economic activity in the state. The CDFW Aquaculture Program oversees California's aquaculture industry through policies and regulations to ensure conformance with statutory guidance from the Legislature. Together, the CDFW and Commission balance the protection of natural resources and the development of sustainable commercial aquaculture (CDFW, 2022).

For more information about locations proposed in the SSAP that are not within the District's jurisdiction and would require a lease from the Commission, please **see Section 12.1.**

4.7.4 California Department of Public Health (CDPH)

CDPH regulates both pre-harvest and post-harvest activities associated with shellfish aquaculture. The Environmental Management Branch is responsible for pre-harvesting activities and oversight, including management of the State's biotoxin monitoring program and certification of shellfish growing areas. The Food and Drug Branch oversees post-harvest requirements of the NSSP, including the packaging and distribution of shellfish products intended for consumption.

4.8 Port of San Diego

4.8.1 Port Master Plan and Port Policies

The Coastal Act, Public Trust Doctrine, the San Diego Unified Port District Act (Port Act), and the District's certified PMP serve as the legislative and policy framework for the District's management of tidelands and guide the District in carrying out its core mission. These laws and regulations provide the foundation for District programs, initiatives, and policies and will guide development of the SSAP.

The Port Act, Public Trust Doctrine, and the PMP govern the District's management authority to balance commerce, navigation, fisheries, recreation, and environmental stewardship in and around San Diego Bay. For example, § 4(a) of the Port Act states that for the establishment of the District that it is "A port district … for the development, operation, maintenance, control, regulation, and management of the harbor of San Diego upon the tidelands and lands lying under the inland navigable waters of San Diego Bay, and for the promotion of commerce, navigation, fisheries, and recreation thereon…" Further, § 4(b) continues that "…the district may use the powers and authority granted pursuant to this section to protect, preserve, and enhance all of the following: (1) The physical access to the bay. (2) The natural resources of the bay, including plant and animal life. (3) The quality of water in the bay."

The District's Port Master Plan (PMP) is an implementation vehicle for the Coastal Act, Public Trust Doctrine, and Port Act. Aquaculture is currently described as an allowable use within the certified PMP in certain water and land use designations. As of the publication date of this document, the PMP is undergoing an update (PMPU) by the District. Once certified, the PMPU would serve as the basis of water and land use consistency for aquaculture activities planned within the District's jurisdiction. In addition, in 2020 per Senate Bill (SB) 507, the District was granted approximately 8,000 additional acres of submerged lands within San Diego Bay to manage from the California State Lands Commission. As a requirement of the legislation, the District is in the process of developing a Trust Lands Use Plan (TLUP) for this newly granted area. The TLUP must be certified by the CCC to be incorporated into the certified PMP and approved by the State Lands Commission before the District can exercise coastal permitting authority over the newly granted area.

4.8.2 Port of San Diego - Aquaculture & Blue Technology Department

In 2015, the District established its Aquaculture & Blue Technology (AQ&BT) Department, recognizing the growth opportunities of the blue economy sector and its strategic position within

one of the world's leading blue technology clusters. The AQ&BT Department has been conducting planning and pre-development work to support and inform opportunities in the blue economy in and around San Diego Bay. In 2016, the District created the Blue Economy Incubator (BEI) to assist in the creation, early development, and initial scaling of sustainable aquaculture and port-related blue technology ventures. Through its BEI, the District seeks innovative aquaculture and blue technology proposals to address environmental challenges and inform future blue economy opportunities.

5

Activities Within the SSAP

5.1 Market Opportunities for Shellfish and Seaweed

5 Activities Within the SSAP

SSAP activities must support shellfish and seaweed aquaculture. These activities could include but are not limited to the propagation, cultivation, maintenance, harvesting, and processing of shellfish and seaweed, as well as research and workforce development.

The SSAP supports activities which occur on land or in water during multiple phases of the aquaculture process. In general, shellfish and seaweed aquaculture activities occur in three different, often sequential phases:

- **Upstream –** the period before the plants or animals reach the "farm," or growing operation. This phase consists of activities related to the rearing of seed, which generally occurs in hatcheries and/or nurseries. Activities within this phase can occur in water or on land.
- **Grow-out –** when plants or animals are in the location where they are allowed to grow (i.e., the "farm") into a marketable product. This phase includes seeding, culling, and harvesting and more broadly includes installing, accessing, and maintaining aquaculture gear and infrastructure to support these activities. These activities can occur at in-water sites and/or landside locations.
- **Downstream –** the period when product is being prepared for its intended purpose. Activities within this phase typically occur on land and include depuration, processing, refrigeration, packaging, and distribution and any installation, access to, and maintenance of each activity within this phase.

In the SSAP:

an "aquaculture operator" or "operator" is an individual or entity who performs shellfish and seaweed aquaculture activities

an "aquaculture operation," "growing operation," or "operation" is the area in which shellfish and seaweed aquaculture activities take place. This area may also be referred to as a "farm"

There are some aquaculture activities that are not exclusive to any individual phase and could occur in multiple phases. Examples of these types of activities include storage/warehousing, maintenance, employee support (e.g., parking, breakroom) and administrative functions. The District also anticipates that there could be multiple aquaculture operations within an in-water or landside location – depending on the size constraints of a site or operation.

In addition to supporting commercial growing and harvesting, the District is committed to fostering innovative aquaculture research and development in partnership with local research institutions. Examples of potential research that could be supported through the SSAP would focus on priorities identified by industry, such as disease resistance, new sustainable farming methods, innovative bioremediation techniques, and emerging market opportunities.

The SSAP also seeks to support workforce development by creating pathways for local participation in aquaculture-related employment, training, and education. Through partnerships with industry, educational institutions, and community-based organizations, the District will work with stakeholders to expand access to skills development and hands-on experience associated with aquaculture operations, research, and ocean stewardship. These efforts are intended to support long-term environmental and economic opportunities for communities adjacent to the proposed aquaculture sites while helping build a skilled, locally rooted workforce that reflects the region's coastal communities. While all of the proposed sites can support these workforce development activities, the former A-8 Anchorage could be an ideal site given its accessibility.

5.1 Market Opportunities for Shellfish and Seaweed

Growing areas highlighted in **Section 6** of the SSAP offer opportunities to grow shellfish and seaweed for both consumptive and non-consumptive markets. The growing demand for non-consumptive seaweed products in particular enables commercially viable cultivation while complying with water quality regulations, particularly in locations where poor water quality is a concern. By significantly increasing the capacity for farmed shellfish and seaweed in California, the SSAP can help strengthen domestic markets, reduce reliance on imports, and drive sustainable development across the ocean production sector. As this sector expands, market dynamics will continue to evolve, requiring ongoing analysis to adapt to emerging opportunities, shifting consumer preferences, and advancements in cultivation and processing technologies. Regular market assessments will be essential to ensuring long-term economic viability and maximizing the benefits of sustainable aquaculture growth. While the District can support marketing efforts for shellfish and seaweed after harvest, decisions about their post-harvest use and market destination ultimately rest with the farm operator, provided they comply with their Operations Plan (**See Section 10.4**).

5.1.1 Consumptive Markets

Shellfish are the most valuable marine aquaculture species in the U.S., valued at $318 million in 2022 (NMFS, 2024). The U.S. market for live oysters has experienced significant growth over the past two decades, driven by increasing demand in high-end restaurants and raw bars. With direct-to-consumer prices in California

ranging from $0.35 to over $1 per oyster, they represent a highly profitable opportunity for growers (NMFS, 2024). Similarly, mussels and abalone cater to California's luxury consumer market, with abalone fetching premium prices of upwards of $60 per pound due to its long growth cycle (Catalina Offshore Products, 2025). By increasing the availability of domestically farmed shellfish, the SSAP offers a shorter supply chain, reducing freight costs and carbon footprints compared to imported products, further strengthening market appeal.

The consumptive market for seaweed in the U.S. is nascent but gaining traction. Domestically cultivated seaweed is often sold as a premium food product in high-end restaurants and health food stores. It is also sold fresh or dried to specialty shops, farmers markets, and upscale restaurants, with some species selling for around $10-15 per pound for fresh seaweed and $60-80 per pound for dried seaweed (Considine et al., 2023).

5.1.2 Non-consumptive Markets

The potential for non-consumptive shellfish applications allows for extension beyond traditional consumptive markets to include bivalve shell waste as a valuable raw material. For example, oyster and mussel shells, primarily composed of calcium carbonate, can be repurposed into a range of high-value by-products, reducing environmental waste while supporting sustainable industry practices. Recent research highlights their use in artificial stone for countertops, cement and construction materials, soil amendments, water filtration, and even pharmaceutical applications. Innovative recycling solutions, such as converting shells into calcium oxide for use in bio-based plastics and environmental remediation, demonstrate the growing economic potential of shellfish by-products (Silva et al., 2019). As demand for sustainable materials increases, integrating non-consumptive shellfish uses into aquaculture expansion strategies can enhance circular economies and reduce reliance on virgin resources.

Non-consumptive markets for seaweed provide exciting opportunities to expand the reach and impact of the SSAP. Seaweed's biochemical composition varies by type, species, and growing environment, making seaweed well-suited for a wide diversity of value-added products. Established markets, such as hydrocolloids (thickeners used in food and beverages, cosmetics, and pharmaceuticals) offer strong foundations for growth, while emerging markets, including biostimulants, bioplastics, construction materials, biofuels, carbon, nutrient and biodiversity credits, and livestock feed supplementation to reduce methane emissions are rapidly gaining interest (Linsmayer & Gardner, 2025). Farmed seaweed is well-positioned to meet the growing demand in both established and emerging sectors. Additionally, advancements in research and processing technologies are opening doors to innovative, consumer-facing seaweed products, such as pet food, plastic alternatives, and fabrics that leverage farmed seaweed's unique properties.

6

SSAP Locations In and Around San Diego Bay

6 SSAP Locations In and Around San Diego Bay

6.1 Preliminary SSAP Analyses

Since 2016, the District has conducted a series of preliminary studies and analyses in order to consider where and how to support shellfish and seaweed aquaculture in and around San Diego Bay. In partnership with the National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS), National Centers for Coastal Ocean Science (NCCOS), the District supported coastal marine spatial analyses (collectively referred to as the NOAA-NOS-NCCOS analyses). These analyses highlight the following:

- Marine spatial planning to identify in-water sites where shellfish and seaweed aquaculture activities could occur in and around San Diego Bay.

For more information on the marine spatial planning analyses and the identified locations, please **see Section 6.2.**

- Land-based feasibility to identify space and infrastructure appropriate to facilitate landside shellfish and seaweed aquaculture operations.

For more information on the land-based feasibility analysis, please **see Section 6.3.**

- Baseline water quality analysis to demonstrate whether areas are healthy enough to support the growing of shellfish and seaweed.

Additional analyses were conducted following the release of the First Discussion Draft (2024) based on the input received from stakeholders regarding potential alternative locations in South San Diego Bay near the Former A-8 Anchorage and along the northwest shore of Coronado (North Island). These suggestions prompted a series of detailed technical and spatial studies, providing a deeper review of data including submerged aquatic vegetation, shoreline orthoimagery, bathymetry, oceanography, wave height, vessel traffic, and recreational activity.

Continued modelling and planning efforts are in progress that will further refine these locations and their suitability to support future shellfish and seaweed aquaculture. These include regular baywide water quality monitoring, precision siting and farm configuration modelling, ecosystem carrying capacity modelling, seaweed and shellfish bioremediation potential, and land-based infrastructure design and engineering. These studies will help to further inform the best uses for each proposed location and help shape District guidance for operators.

In December 2025, CDPH finalized a Limited Sanitary Survey Report Concerning Shellfish Growing Area Classification for Imperial Beach, San Diego Bight, and San Diego Bay (Technical Report No. 25-16). The Report concluded that these areas should be classified as ***Prohibited*** due to potential pollution sources generally located south of San Diego Bay, including the Tijuana River Estuary. Based upon this classification, the areas currently are not authorized for growing shellfish for human consumption. As noted in the Report, "The *Prohibited* growing area classification is used to identify a growing area where the harvest of [shellfish] for any purpose, except depletion, gathering of seed or nursery culture for aquaculture, is not permitted." The classification does not restrict the growing of shellfish for non-consumptive purposes or cultivation of seaweed. The Report further notes that "CDPH welcomes continued engagement, especially as infrastructure projects are completed and generate reliable data to demonstrate stable improvements in water quality and reduction in the frequency and severity of pollution events from the Tijuana River." For a map of the *Prohibited* zone, see **Appendix B.**

The District is currently engaging with CDPH to determine what additional information and water quality testing is needed to support a reclassification of certain areas proposed for development of aquaculture uses, like Zuñiga Shoals. For the last four years, a proactive water quality testing effort has been completed across a transect of Zuñiga Shoals. This water quality testing effort has included metrics such as but not limited to fecal coliforms (adhering to the NSSP required testing methods), molecular markers of fecal contamination, and bacterial and viral pathogens of concern. The water quality testing effort has indicated excellent water quality across Zuñiga Shoals. Future engagement with CDPH will hopefully

The identification of suitable in-water sites for aquaculture is an iterative process. While the acreages provided below have been identified as suitable for aquaculture, it is expected that proposed leases would be considered within a more defined and potentially smaller section of the suitable acreage, and that operations may occupy a smaller footprint than the overall leased acreage. Therefore, it is not anticipated that all of the area identified as suitable for aquaculture would actually be fully occupied for aquaculture uses, and that actual leased and occupied areas would be further refined during the permit application process described in **Section 10.**

take advantage of the data collected to date, while also collaboratively identifying water quality data collection that may permit the consideration of revisions to specific growing area classifications.

6.2 In-Water Locations

6.2.1 Marine Spatial Planning Analyses

In partnership with NOAA and NOS-NCCOS, the District supported two coastal marine spatial analyses. The first analysis, *Spatial Opportunity Analysis to Inform Aquaculture Development Planning in San Diego, CA*, identified nearly 5,400 submerged acres of potentially usable area, as well as suitable species and gear types for a variety of shellfish and seaweed aquaculture opportunities. This analysis considered major potential use conflicts between future aquaculture and current uses in the San Diego offshore region and identified the potentially usable area to avoid or minimize those conflicts to the greatest extent possible. A second analysis, *Coupling Spatial Aquaculture Opportunity Analysis with Habitat Interactions Predictions*, further refined the specific opportunity locations and evaluated potential interactions with sensitive and essential fish habitat. These studies culminated into a published, peer-reviewed paper titled "Balancing conflict and opportunity - spatial planning of shellfish and macroalgae culture systems in a heavily trafficked maritime port" in *Frontiers of Marine Science* in January 2024 (Wickliffe et al., 2024).

Based on these analyses, three in-water areas in and around San Diego Bay were identified as suitable for shellfish and seaweed aquaculture. The culture methods identified for each are not exhaustive but represent examples of what could be feasible in each area. These areas could support multiple operators, and it is anticipated that different cultivation methods and/or different species could be utilized in the same area. Permitting and siting requirements and allowances for buffers and access corridors will be incorporated, reducing the actual amount of farmed acreage.

In 2025, NOAA published a Technical Guide to Marine Aquaculture Gear. This guide serves as an orientation to aquaculture gear systems for decision makers conducting environmental reviews for aquaculture permitting and management.

This Discussion Draft reflects feedback received by the District from a 60-day public review period (August 20-October 25, 2024), during which 20 comment letters were received from stakeholders, including agencies, organizations, and individuals. In response, maps of potential in-water locations were reanalyzed and refined to improve siting feasibility and reduce conflicts between aquaculture uses and existing marine uses, such as military operations, boating, surfing, and recreational and commercial fishing. This document also expands discussion of the environmental benefits and potential opportunities provided by the SSAP.

Potential Sites for Shellfish and Seaweed Aquaculture Program (SSAP)

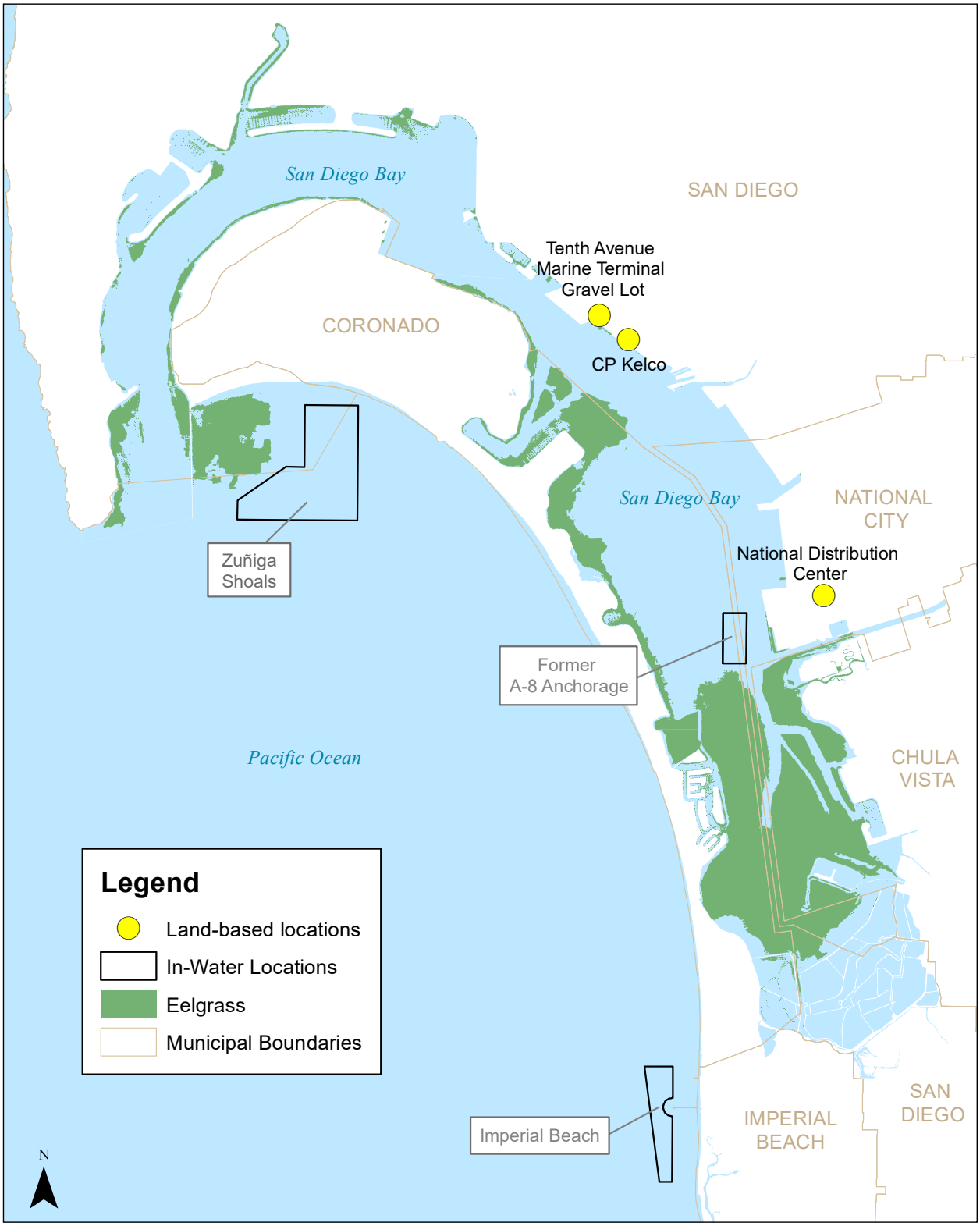


Figure 4. Proposed initial in-water and landside locations for the Shellfish and Seaweed Aquaculture Program.

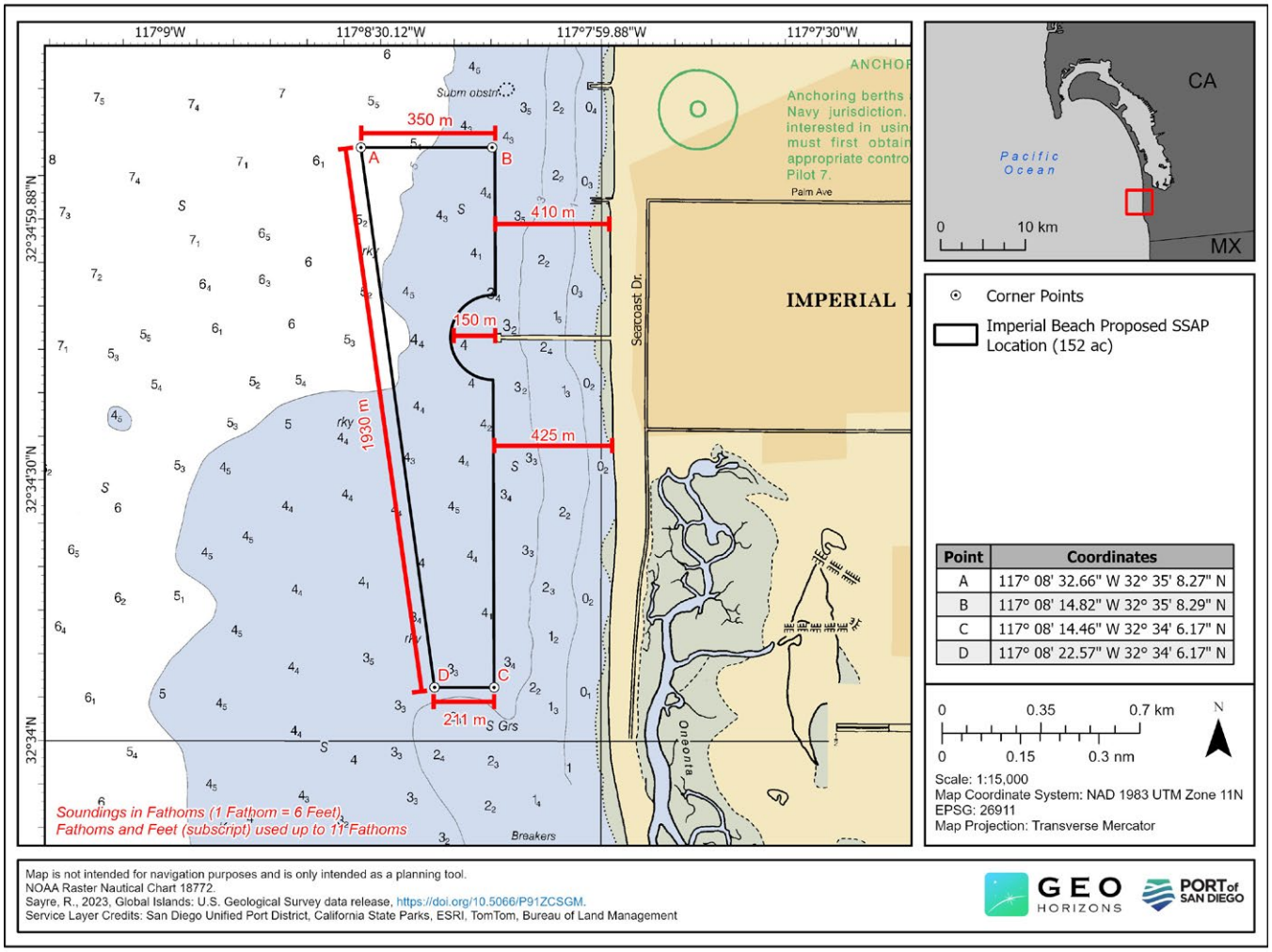


Figure 5. Map showing the proposed location offshore of the City of Imperial Beach.

6.2.2 Proposed In-Water Locations

The following are the three SSAP in-water locations along with a brief description and approximate size:

Imperial Beach

This site contains submerged lands in the This site contains submerged lands in the open ocean west of the City of Imperial Beach that were granted in trust to the District and are within the District's coastal permitting authority. This site is approximately 10 nautical miles away from the nearest public marina and boat ramp, located at Shelter Island. It is estimated that

Originally proposed at 270 acres in the First Discussion Draft (District, 2024), this site's size was reduced to 152 acres in this Second Discussion Draft to address potential impacts to recreational uses such as surfing or swimming and associated lifeguarding activity, and the practicality of siting farms in shallow or high wave energy areas. Consequently, the revised polygon excludes areas that are less than 6 meters (19.7 feet) in depth.

up to 152 acres of this site could be used to grow kelp (brown seaweed) and up to 110 acres to grow juvenile shellfish via horizontal longlines, hanging ropes, and baskets.

Due to concerns associated with the current water quality conditions of this area influenced by wastewater discharges from the Tijuana River Valley, this site could only be utilized for non-consumptive uses, such as shellfish seed, fertilizers, or bioplastics until water quality is improved. In its current state, this site represents a unique opportunity to demonstrate and measure the environmental benefits that shellfish and seaweed could have in providing bioremediation services and improving water quality to this area. Shellfish, such as oysters and mussels, filter water as they feed, removing excess nutrients, bacteria, and contaminants from the water column that can lead to harmful algal blooms and beach closures. Seaweed, such as giant kelp and sea lettuce, can absorb carbon dioxide and pollutants like nitrogen, phosphorous, and heavy metals, helping to mitigate ocean acidification, eutrophication, and contamination. Growing these beneficial species at scale has the potential to positively affect the surrounding coastal communities and serve as a nature-based solution to the current challenges relating to ocean pollution. However, if the water quality issues are resolved, and the District receives the necessary confirmations from regulatory agencies such as CDPH, then consumptive uses could be considered in the future.

Former A-8 Anchorage

This site consists of approximately 80 acres of submerged lands located 1,200 feet west of the National City Marine Terminal within San Diego Bay. The area is currently within submerged lands that were granted in trust to the District per SB 507; however, it is presently within the CCC's permitting authority because it is not yet incorporated into the District's Certified PMP. This site is approximately 1 nautical mile away from the nearest public marina and boat ramp, located adjacent to Pepper Park in National City.

Potential aquaculture operations include growing juvenile shellfish in floating or suspended gear and growing red and green seaweeds via horizontal longlines, hanging ropes, and baskets. Currently, this site could only be utilized for non-consumptive uses, such as shellfish seed, fertilizers, bioplastics, or bioremediation (see text box on **page 57** for more information). However, if the District receives the necessary confirmations from regulatory agencies such as CDPH, then consumptive uses could be considered in the future.

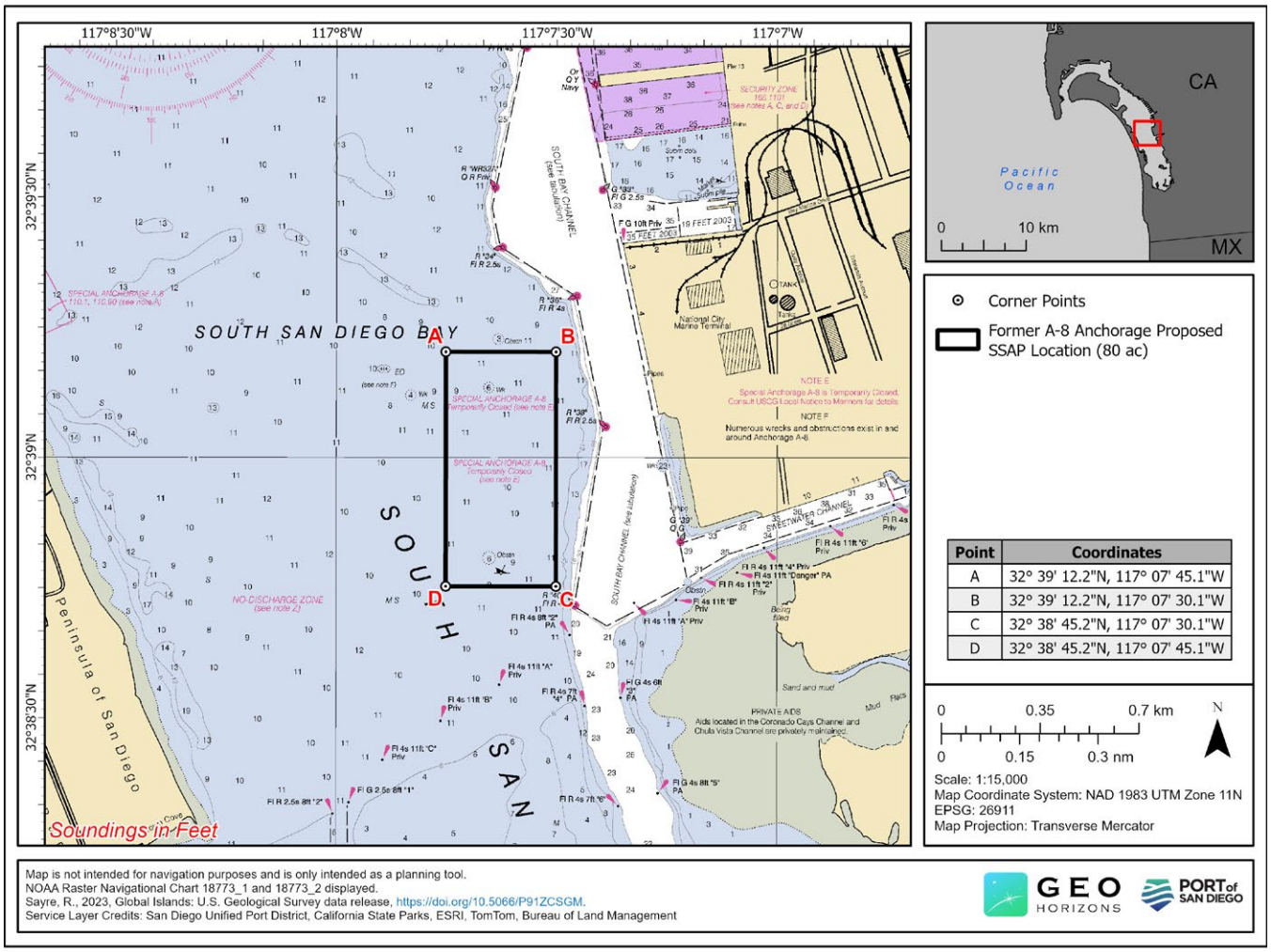


Figure 6. Map of the proposed location at the Former A-8 Anchorage.

According to the NSSP 2023 Model Ordinance, "any growing area within the confines of the marina proper is presumed to be contaminated for some period of time. Therefore, no growing area within the marina proper can be placed in the approved classification." Because of the proximity of Former A-8 Anchorage to marinas within the bay, any future sites proposing aquaculture for consumptive uses near existing marinas would likely require additional water quality testing and certification to confirm whether such areas could be classified as "conditionally approved" or "restricted" under the NSSP. Absent such certification by CDPH, only non-consumptive uses would be permitted.

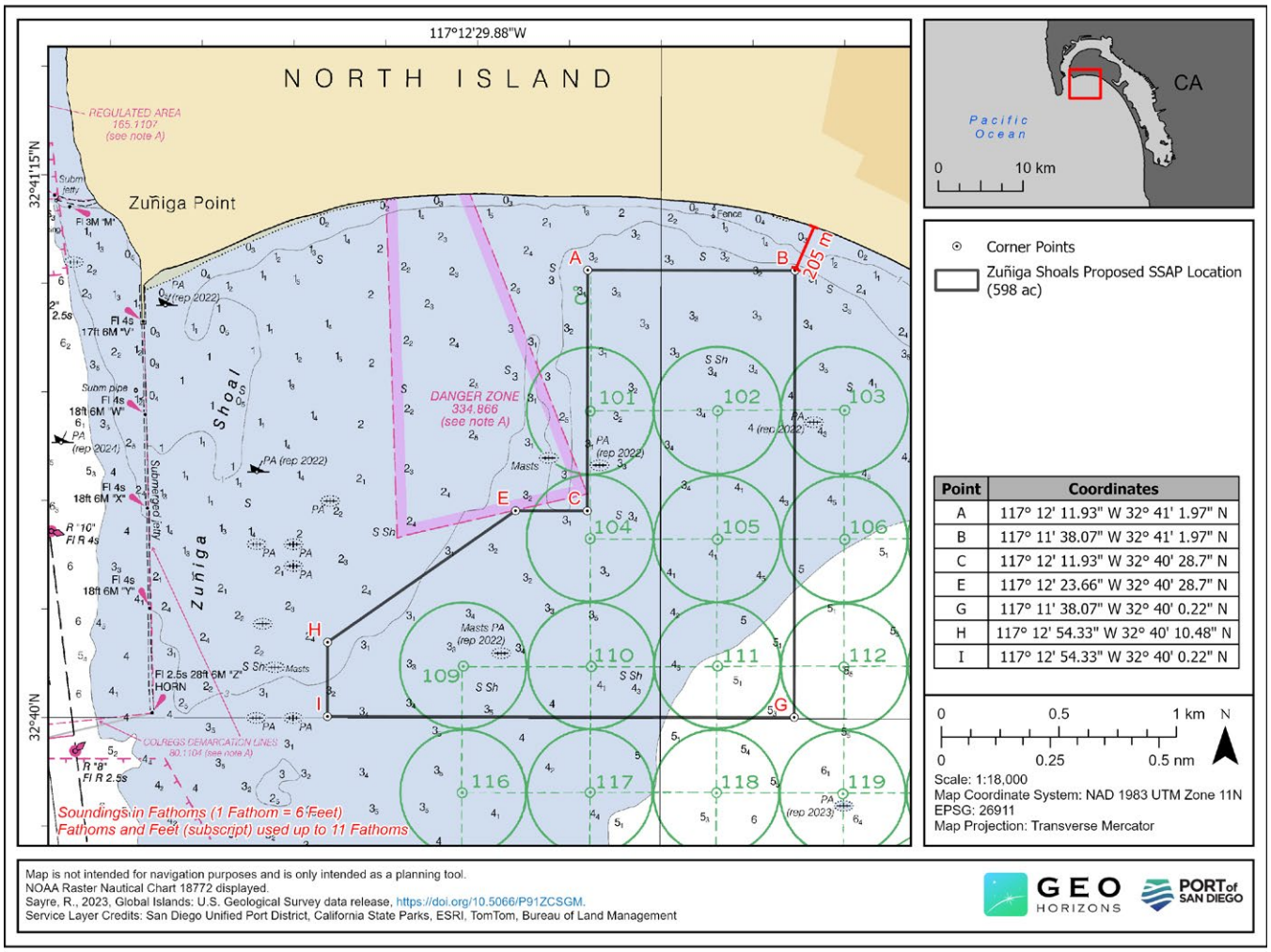


Figure 7. Map of the proposed location at the Zuñiga Shoals.

Zuñiga Shoals

This nearshore, open-ocean, site is south of U.S. Naval Base Coronado and west of the City of Coronado. The submerged lands are within the CA Fish and Game Commission's aquaculture leasing jurisdiction and within the CCC's permitting authority. Based on the wave, tidal, and bottom conditions at Zuñiga Shoals, it is estimated that up to 598 acres of this site could be used to grow kelp (brown seaweed), oysters, and mussels via horizontal longlines, hanging ropes, and baskets. This site is approximately 4 nautical miles away from the nearest public marina and boat ramp, located at Shelter Island.

The Northwest area of Zuñiga Shoals also hosts a significant eelgrass (*Zostera pacifica*) bed (historically up to 300 acres), which is an important habitat for fish, invertebrates, and foraging birds. While proposed aquaculture siting would occur outside of existing eelgrass beds, the District recognizes the need to evaluate potential ecological interactions between shellfish farming and nearby eelgrass.

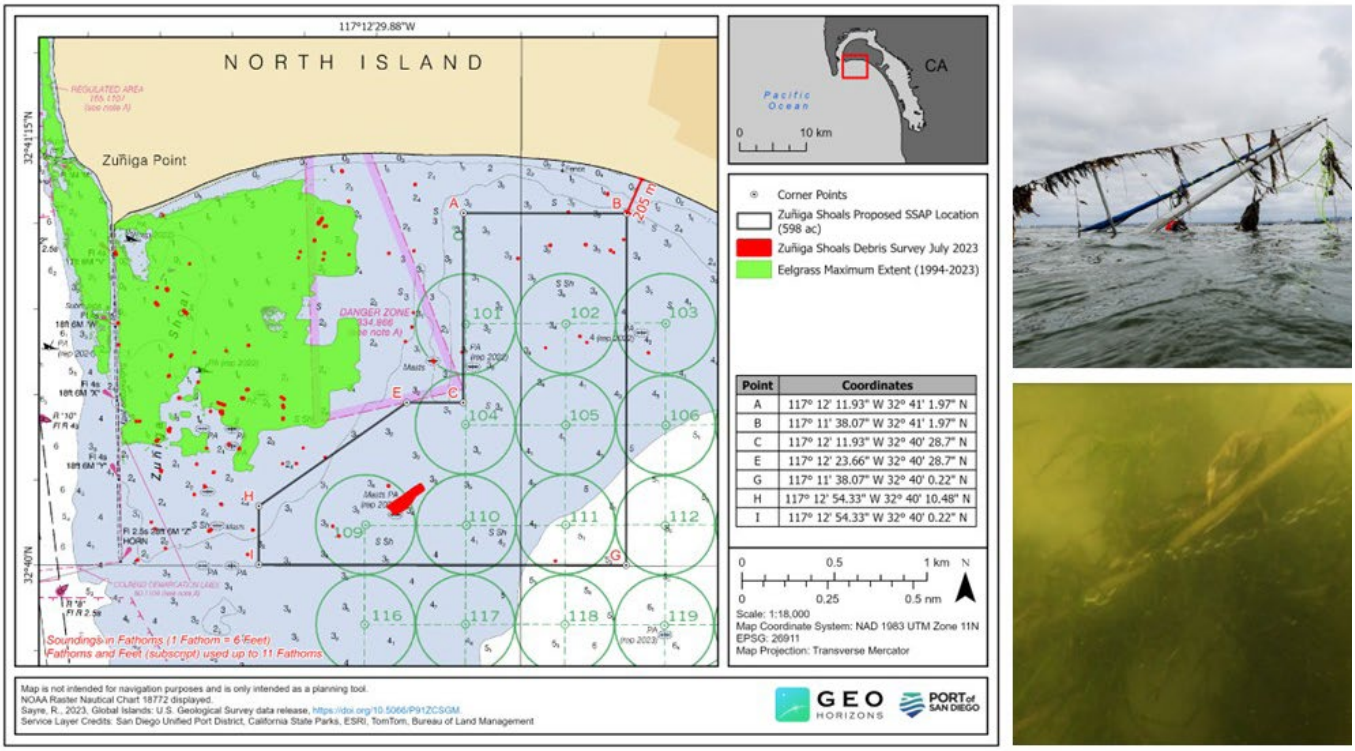
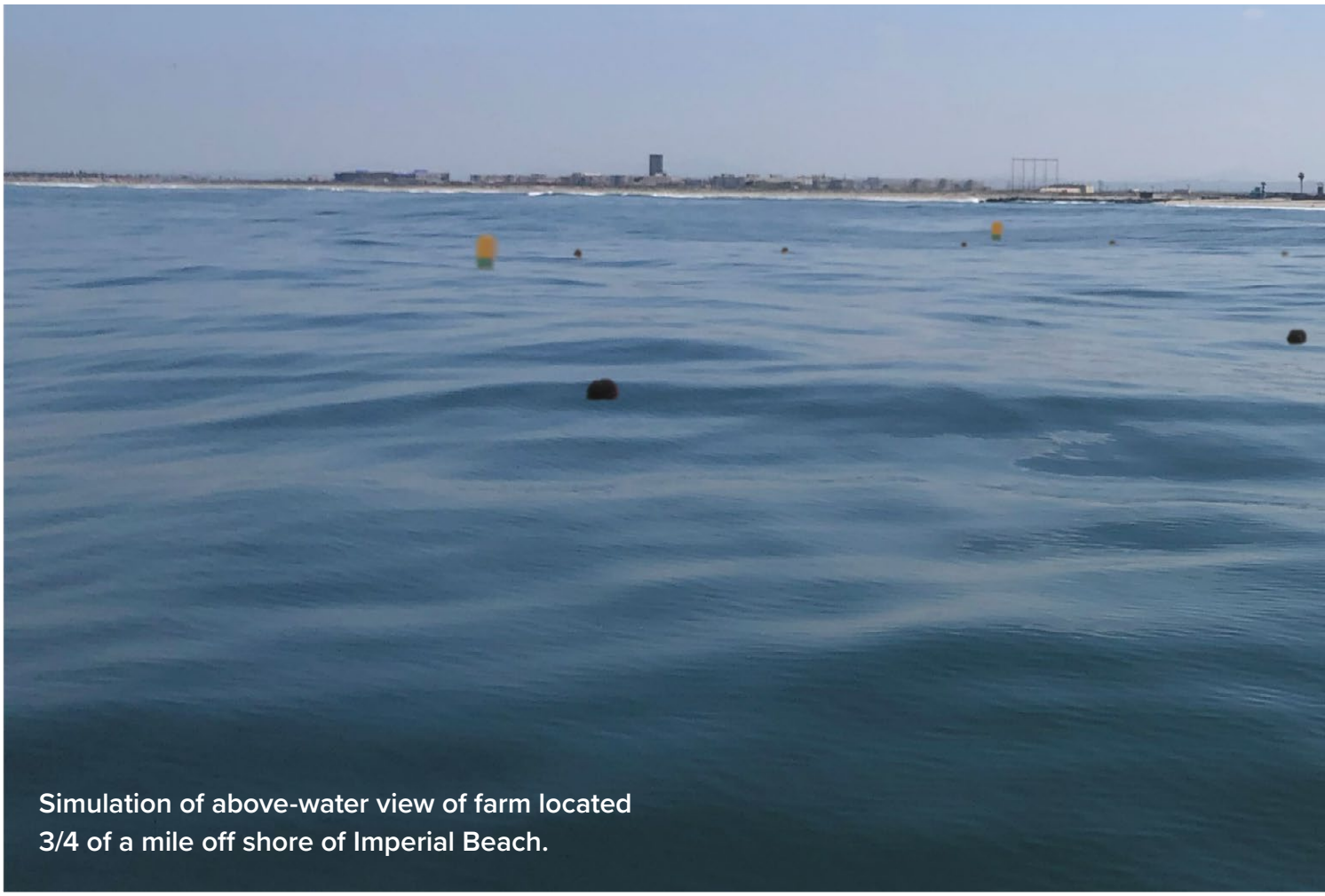


Figure 8. Left - Map of the proposed location at the Zuñiga Shoals with maximum extent of eelgrass presence from 1994-2023, and marine debris survey data from 2023. Upper right - Newly sunken sailboat with mast, rigging, and entangled debris visible at the surface. Lower right - Eelgrass in the vicinity of newly sunken sailboat.

Studies have shown that shellfish aquaculture can influence light availability, nutrient cycling, and water clarity, which in turn may affect eelgrass growth, although impacts are highly site-specific and can be neutral or even beneficial in certain conditions (Dumbauld et al., 2009; McKindsey et al., 2011). The District is committed to incorporating the best available science and stakeholder input to ensure that aquaculture development is in compliance with the California Eelgrass Management Plan and compatible with the health and persistence of this important habitat.

The entire Zuñiga Shoals area (~1,300 acres), includes eelgrass beds and an area that is

Originally proposed at 945 acres in the First Discussion Draft (District, 2024), this site's size was reduced to 598 acres in this Discussion Draft to avoid potential impacts to military, commercial, and recreational usage, and the practicality of siting farms in shallow or high wave energy areas. Consequently, the revised polygon excludes areas that are less than 6 meters (19.7 feet) in depth.



Simulation of above-water view of farm located 3/4 of a mile off shore of Imperial Beach.

utilized by some members of the public as an unofficial anchorage in close proximity to San Diego Bay. The area's unofficial use as an anchorage has become increasingly problematic, with numerous vessels abandoned or left derelict. These abandoned and derelict vessels have resulted in large amounts of sunken marine debris leading to environmental damage, dangerous navigational hazards, challenges to enforcement within the area, and costly removal and disposal of abandoned or sunken vessels and debris by various jurisdictions. Marine debris surveys conducted in 2023 revealed that of the 94 debris targets found, 46% were located within the historic eelgrass range and comprised vessels (generally intact, varying degrees of exposed boat hull) or various types of smaller debris (primarily comprised of the remains of heavily degraded vessels, motors, wire, railings, boat plumbing, fishing equipment, hazardous waste, etc.) (WSP 2025).

Establishing aquaculture and other more ecologically and environmentally compatible uses in this location could provide a pathway to transition the area away from anchorage use, phasing out unregulated anchoring and thereby improving governance, and enhancing the environment quality of the area.

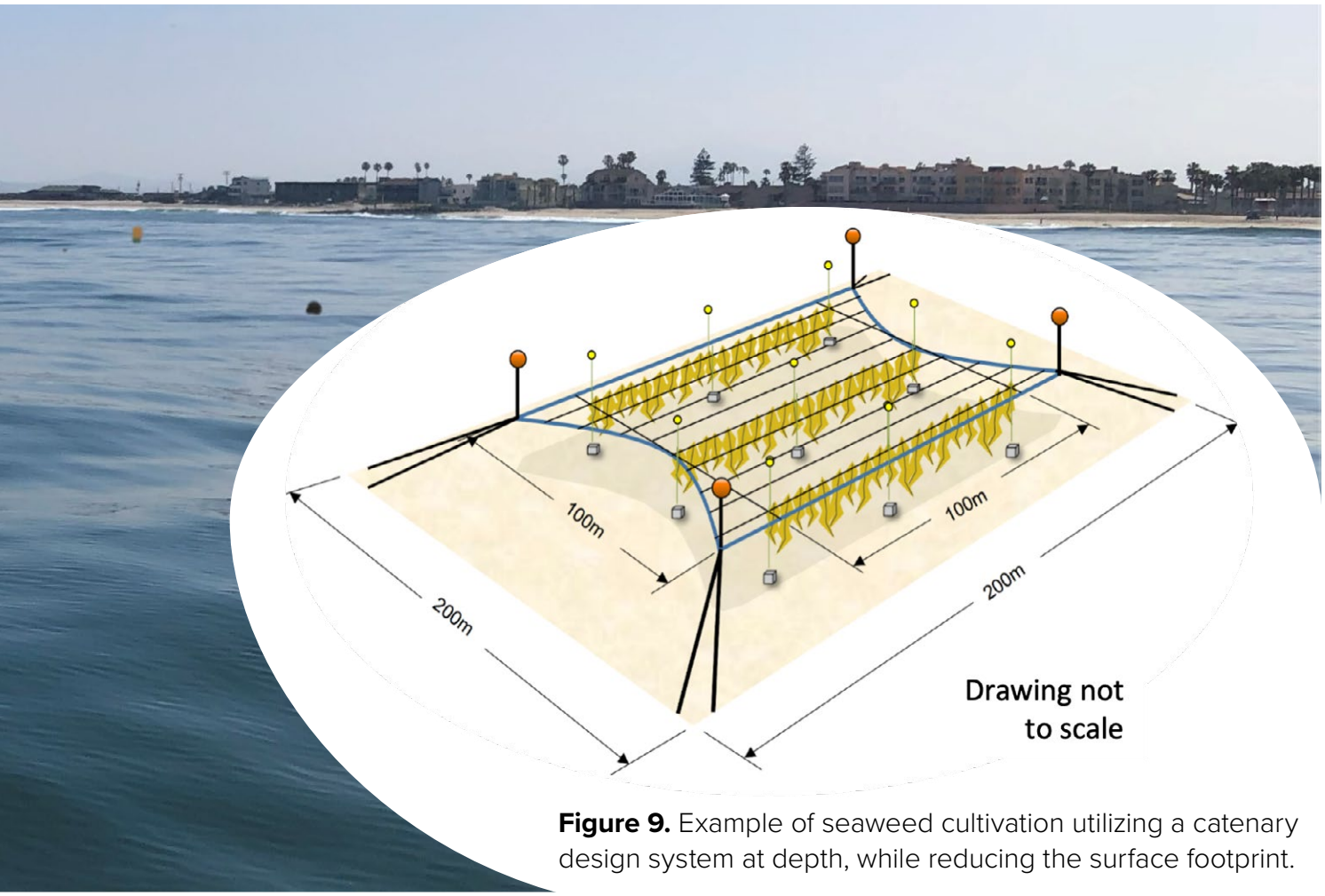


Figure 9. Example of seaweed cultivation utilizing a catenary design system at depth, while reducing the surface footprint.

6.2.3 In-Water Farm Siting and Farming Improvements

The number, location, size, and orientation of the farms within each of the in-water locations will be informed by spatial and precision site modeling to be conducted as part of the SSAP process. In-water aquaculture systems differ slightly based on the species, culture methods, intended use of the cultivated product, and environmental conditions (i.e., bottom substrate, wave energy, presence of sensitive habitat, etc.). These factors will influence buffer distances between farms, design elements such as anchor placement and line spacing, and installation requirements. Farm and gear configuration will be specifically engineered for ocean or bay conditions with respect to size and strength of all line, anchoring, hardware, buoyancy, and other mooring system considerations. While the District can provide consultation on farm design and layout, operators will ultimately be responsible for in-water design, installation, deployment, and maintenance that comply with federal and state laws and District requirements, standards, and lease terms. It is also important to note that although these locations will be designated for aquaculture, other activities such as recreational boating and fishing may not be fully restricted and could still allow for shared usage.

6.3 Landside Facilities

6.3.1 Land-based Feasibility Analysis

The District conducted a preliminary land-based infrastructure feasibility analysis for landside upstream and downstream activities (**see Section 5** for more details on activities within the SSAP). The analysis evaluated potential land areas and sites of interest within the District's jurisdiction. Suitable landside aquaculture sites were identified based on alignment with the District's certified PMP, production-specific infrastructure needs and site attributes such as:

- covered/enclosed space;
- access to electricity;
- outdoor space;
- access to municipal water and sewer;
- seawater intake and discharge;
- recirculating aquaculture system/filtration technologies; and
- access to transportation (vessel or vehicle).

Sites were identified based on the availability of appropriate infrastructure and space, the ease to which appropriate infrastructure or assets could be added, dependent on consistency with the certified PMP, and availability.

Landside aquaculture activities could occur in existing or newly constructed onshore warehouses or facilities. Such facilities could house equipment and storage space to be used during the hatchery and nursery stage as well as the harvesting and processing stages of the aquaculture cycle. The facilities could house shellfish/seaweed hatchery and nursery tanks, recirculation filtration equipment, drying racks, workshop, equipment storage areas, office space, and/or refrigeration equipment, depending on the needs of the species being farmed. The facilities also could include outdoor laydown yard/equipment storage space and seawater intake and discharge infrastructure. Other infrastructure could also include waterside access for working vessels. While the District can provide consultation on facility

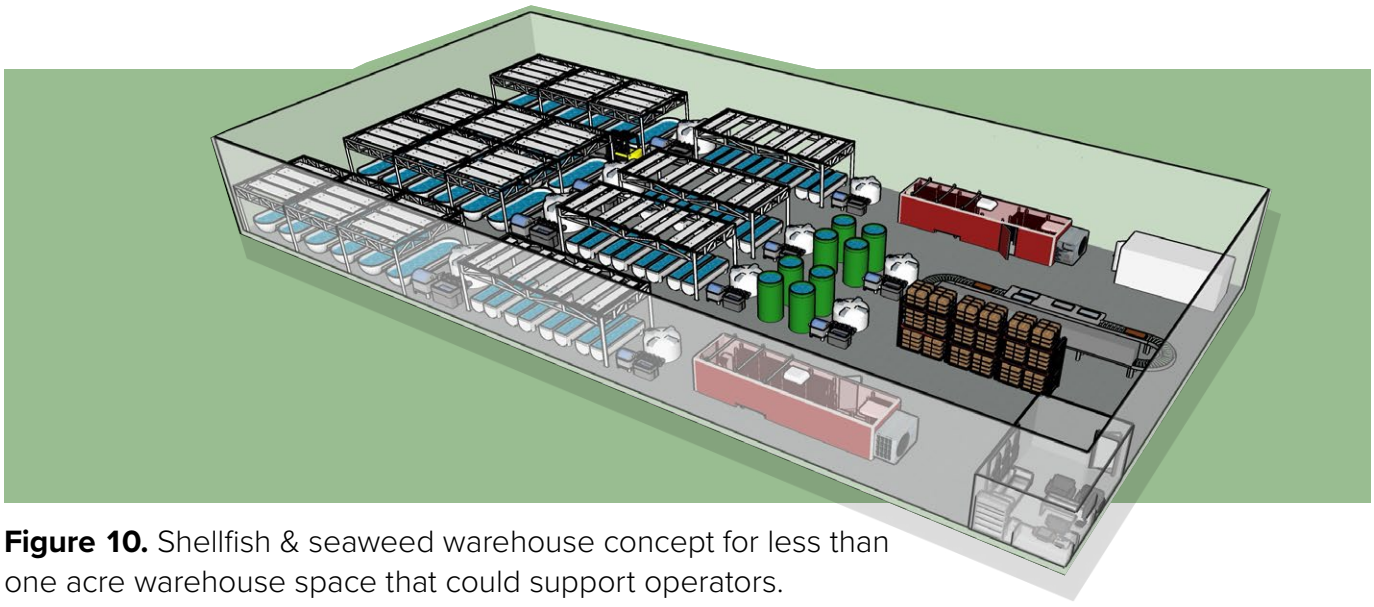


Figure 10. Shellfish & seaweed warehouse concept for less than one acre warehouse space that could support operators.

design and layout, operators will ultimately be responsible for design, installation, and maintenance of their own equipment, given that they comply with federal and state laws and District requirements, standards, and lease terms.

6.3.2 Proposed Initial Landside Locations

The District identified three preliminary sites as possible locations for the development of landside aquaculture activities and are being evaluated for inclusion into the SSAP:

- **CP Kelco Leasehold –** Located at 2031 E. Belt Street in the City of San Diego. The specific site is located on the eastern shore of the Bay, southeast of the Coronado Bridge (State Route 75);
- **Gravel Lot Outside and Adjacent to Tenth Avenue Marine Terminal (TAMT) –** Located at 1800 Crosby Road, in the City of San Diego. The specific site, a gravel lot, is located on the eastern shore of the Bay, southwest of East Harbor Drive and the railroad tracks, north of the Coronado Bridge and Cesar Chavez Park; and
- **National Distribution Center Leasehold –** Located at 1022 Bay Marine Drive in the City of National City. Specific space has been identified within the warehouse located east of the National City Marine Terminal and Pasha Automotive Services and just west of the railroad tracks, combined with adjacent outdoor space.

These sites are all within the District's jurisdiction and are designated in the certified PMP as Marine-Related Industry (CP Kelco and National Distribution Center) or Marine Terminal (TAMT), land use designations that allow for aquaculture uses. These preliminary sites also offer existing infrastructure that is compatible with aquaculture uses and would support the development of aquaculture warehouses and equipment. The construction of onshore facilities would include the construction and/or renovation of one or more warehouses that would be used for an office space, preparation of shellfish seed or seaweed specimens, as well as processing the harvested shellfish and seaweed products. It is anticipated that the District may periodically evaluate locations, based on land-based aquaculture production and infrastructure needs, and that more landside locations may be incorporated into the SSAP over time. The District anticipates that these locations will vary in size between 0.5 and 3 acres, depending on what is available at time of approval and whether there are any conflicts of usage.

6.3.3 Landside Site-Specific Information

CP Kelco

Direct Shoreline Access

This site would include use of an existing onshore warehouse (or similar structure), and outdoor storage and processing/drying space. While some improvements may be needed, operations at this site could utilize existing indoor infrastructure and equipment including: a processing room, office space, equipment storage space, a refrigerator/freezer/ice maker, and a back-up generator. Similarly, existing outdoor equipment could also be utilized, including: a loading dock that could accommodate a commercial vehicle for distribution of the aquaculture product, and the existing dock could be used for commercial vessel access. The existing parking could be used for staff vehicle parking. The District anticipates that the existing seawater intake system would need to be upgraded to be used by SSAP activities. The CP Kelco site and proposed location of warehouse facilities are shown in **Figure 4 and 11**.

Gravel Lot Outside and Adjacent to TAMT

Direct Shoreline Access

This site would include the construction of an onshore warehouse (or similar structure) and outdoor storage and processing/drying space in the existing unused gravel lot. The onshore warehouse would include waterside access for loading and off-loading of product, room for processing, office space, equipment storage space, refrigerator/freezer and ice-making, access for distribution, and back-up generator(s). Similarly, the outdoor areas could be used for equipment storage, seawater intake and discharge system and recirculating aquaculture systems infrastructure.

In addition to the waterside access along the apron, operations could utilize the existing floating dock and existing fixed commercial-grade dock. These features can be used for loading and off-loading product and accommodate commercial vessels and vehicles to support the distribution channel. The existing parking area could be used for staff vehicle parking. The TAMT Gravel Lot site and possible location of warehouse facilities are shown in **Figure 4 and 11**.

Figure 11. Initial proposed landside facilities

National Distribution Center

Lacks Direct Shoreline Access

This site would include the renovation of industrial warehouse space to be repurposed as an aquaculture landside warehouse. The structure would include access for loading and off-loading of product, room for processing, office space, equipment storage space, refrigerator/freezer and ice-making, access for distribution, and back-up generator(s) and related infrastructure. Similarly, the outdoor areas could be used for equipment storage and recirculating aquaculture systems infrastructure. The existing commercial loading dock at National Distribution Center would be used for commercial vehicle access. The existing parking lot would be used for worker vehicle parking. The National Distribution Center site and potential industrial buildings identified for renovation and reuse are shown in **Figure 4 and 11**.

7

Species for Growing In-water Within the SSAP

7 Species for Growing In-water within the SSAP

During the NOAA-NOS-NCCOS and District analyses, dozens of shellfish and seaweed species were considered for growing in and around the Bay (Wickliffe et al., 2024). As part of that work, species and growing methods were evaluated at the in-water locations. Typical growing configurations for species within the SSAP utilize a system of horizontal longlines, dropper lines, mooring lines, anchors, and buoys. For examples and descriptions of commonly used growing methods, see **Appendix A.** Based on the analyses, and the District's understanding of the market and habitat conditions, the list was narrowed to several possible species, all of which are native or naturalized to the Bay. The species listed below currently represent the most realistic and best opportunity species for aquaculture development in-water in and around San Diego Bay and are proposed to be permitted within the SSAP. **Finfish aquaculture would not be permitted as part of the SSAP.**

As research and technology advance, other species or gear types and configurations may be considered as part of the SSAP, either through a program update or an individual operations proposal. Any future additions to the SSAP must be consistent with the program's overall established intent, objectives, standards, and requirements. Additional species for consideration in in-water locations must also be consistent with the CDFW approved list of species for growing in California's waters.

Naturalized species are those that are not native to the area but have established, self-sustaining populations in California, and are not considered invasive species by CDFW.

SHELLFISH *Species*

Blue or Blue Bay mussels

Mytilus edulis

Mytilus galloprovincialis

Mytilus trossulus

California mussels

Mytilus californianus

Scale: 10 mm
Author: Joop Trausel & Frans Slieker

7.1 Shellfish Species

7.1.1 Mussels

- **Blue or Blue Bay mussels** (*Mytilus edulis* complex, which consist of *M. edulis, M. galloprovincialis* and *M. trossulus*)
- **California mussels** (*Mytilus californianus*)

Mussels are grown commercially on the continents of Asia, Australia, Europe, and North America. In North America mussel farmers rely on hatchery-produced seed and for SSAP activities, mussels would be obtained from nurseries that are CDFW approved facilities or through natural set. Mussels would be grown using the submerged longline method **(see Figures A1 and A4 in Appendix A).** The juvenile mussels, also known as “seed” or “spat”, are settled onto special texturized ropes designed to promote mussel attachment and growth. The rope is often encased in a biodegradable cotton socking to ensure the mussels stay attached (“mussel sock”) and to reduce predation. As mussels grow, they secure themselves to the rope with their byssal threads and the socking material naturally biodegrades. The system of ropes is secured with lines and buoys anchored to the sea or bay floor. The mussels are suspended by a longline system that may be submerged below the surface to allow certain types of vessel traffic and safe navigation over the farm. Mussels generally reach market size (approximately 1.5 inches) in 12-15 months depending upon the location.

7.1.2 Oysters

- **Pacific oysters** (*Magallana gigas* (Salvi et al., 2021) [formerly *Crassostrea gigas*])
- **Olympia oysters** *(Ostrea lurida*)

The Pacific oyster is the most widely cultivated oyster species in the world and is approved by CDFW for culture in California's waters (CDFW, 2020). Olympia oysters support a small niche consumer market given their diminutive, full-grown, size. These species are currently grown in other areas of California, including Tomales and Humboldt Bays. All oysters grown within the SSAP will be obtained from a nursery that is a CDFW approved facility. Once oysters pass their larval stage, they settle or attach to objects and become immobile. Oysters can grow in clusters (i.e., two or more oysters attached and growing together), or can grow individually, after adhering to a grain of sand or shell. Clustered oysters can be grown on longlines, and typically support the "shucked market", where the meat is removed from the shells and sold in containers, intended to be cooked. Individual oysters are typically cultivated in self-contained floating or suspended units, bags, or baskets. **(see Figures A1, A4, and A5 in Appendix A)** and are generally cultivated for the raw market to be sold to restaurants, grocery stores, and other wholesalers.

Floating upwelling systems (FLUPSY) can also be used to grow oysters and other shellfish in the Bay in the nursery stage of production. These systems typically consist of a large floating platform or pontoon that contains baskets with mesh bottoms to hold shellfish seed. A paddlewheel or pump creates an upwelling current into each of the baskets, delivering food and oxygen to the juvenile shellfish. There are many benefits to locating a FLUPSY in San Diego Bay, most notably the warm water temperatures and nutrient rich water that assist in growing oysters from seed to juvenile size faster than in other northern west coast locations. Shellfish grown to adult size in the Bay would be for non-consumptive purposes (U.S. FDA, 2023), however, juvenile shellfish grown in a FLUPSY can be exported for grow out to a CDFW/CDPH approved site where they can then be grown to adult size and sold for consumption.

Pacific oysters

Crassostrea gigas

Olympia oysters

Ostrea lurida

Scale: 10 mm
Author: Joop Trausel & Frans Slieker

SHELLFISH *Species*

Purple Hinge Rock scallop

Crassadoma gigantea

Scale: 10 mm
Author: Joop Trausel & Frans Slieker

Growing shellfish and seaweed together in the same space is occurring with demonstrated success and can add value to farms by diversifying product lines.

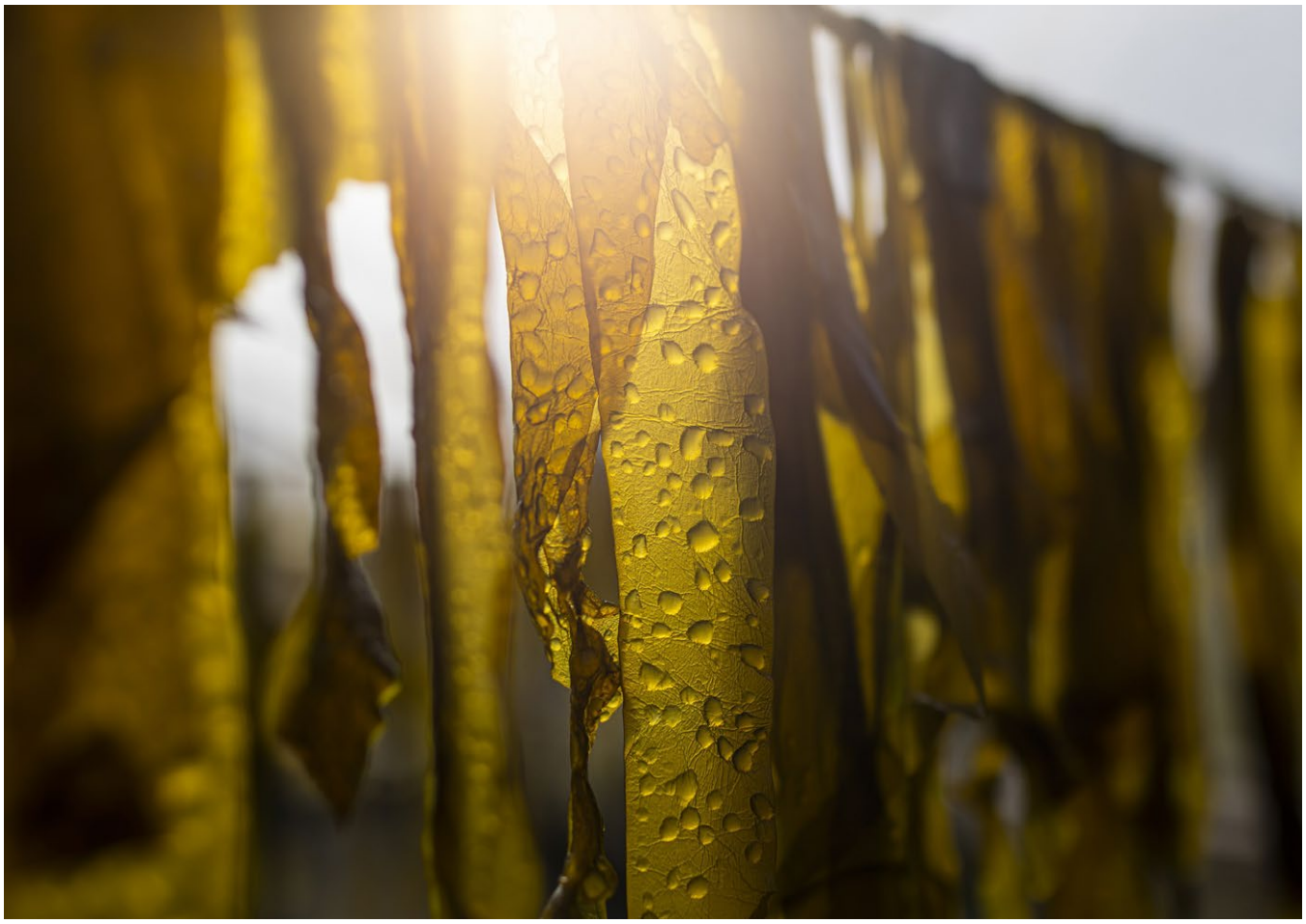
7.1.3 Scallops

- **Purple Hinge Rock scallop** (*Crassadoma gigantea*)

Purple Hinge Rock Scallops have long been regarded as having high potential within the commercial market given their significant per unit value. Rock scallops produce an adductor muscle (the edible part) which is up to two times larger than other scallop species. Cultivation of Purple Hinge Rock Scallops for the commercial market has been the focus of recent research and interest, which will inform potential harvest restrictions and market development for this species. The current focus of research is on larval rearing, the up-take and retention of a saxitoxin – a natural toxin produced during some harmful algal blooms - and how scallops grow in an aquaculture setting, including whether attachment is required at all stages of development, and how attachment may impact growth of the adductor muscle.

Currently, there is not a standardized gear configuration for the cultivation of purple hinge rock scallops, as research and technology are still developing for this species. However, if a future aquaculture operator proposes cultivation of purple hinge rock scallops through the SSAP, the District would consider whether the proposal is consistent with the SSAP's standards and requirements.

7.2 Seaweed Species



7.2.1 Brown Seaweeds (Kelp)

- **Giant kelp** *(Macrocystis pyrifera)*
- **Sugar kelp** *(Saccharina latissima)*
- **Oar weed** *(Laminaria farlowii)*

Kelps (brown seaweed) are an extremely fast-growing group of seaweeds with strong holdfasts that allow them to securely attach to hard objects on the seafloor in their native habitat. Kelps are typically propagated in a nursery and are transferred for grow-out at a cultivation site where they are seeded to the bottom or affixed to gear/rope when they reach the appropriate size. General grow-out systems for kelp (brown seaweeds) would include horizontal longlines or hanging ropes **(see Figures A2, A3, and A4 in Appendix A)**. Depending on the depth of submergence, farms growing kelp may allow for certain types of vessel traffic and safe navigation over the farm. Kelp grows to harvestable size before being cut from the longlines and brought to shore for processing.

SEAWEED *Species*

7.2.2 Red and Green Seaweeds

- **Sea lettuce** (*Ulva spp.*)
- **Red ogo** (*Gracilaria pacifica*)

Rather than a robust holdfast, red and green seaweeds generally have a small point of attachment to substrata, and for the sake of cultivation typically require a self-contained unit, often occurring in tanks on land. Also, unlike with brown seaweeds, red and green seaweeds can be cultured vegetatively, meaning there is no sexual reproduction phase of grow out, and the producer can manage the conditions of a land-based culture system in a way that encourages seaweed to invest solely in growth. In such a system, the producer can manipulate 'seasonality' and create prolonged growing conditions, extending beyond what would be typical for wild seaweed. Controlling for temperature, light, water flow, pH, and nutrients can lead to extended periods of exponential growth, where the producer 'cleaves' partial stock on a weekly (more or less) basis to encourage doubling of biomass. When cultivated in the ocean, red and green seaweeds would generally utilize horizontal longlines and baskets **(see Figures A1–A5 in Appendix A)**.

SEAWEED *Species*

The species described in **Sections 7.1 and 7.2** have been determined to be the most compatible species suitable for aquaculture in and around San Diego Bay based on comprehensive planning and pre-development analyses. Other shellfish and seaweed species for future consideration may include but will not be limited to: Green abalone (*Haliotis fulgens*), Pink abalone (*Haliotis corrugata*), Keyhole limpet (*Megathura crenulata*), Dulse (*Palmaria palmata*), Irish moss (*Gracilariopsis spp.*), Nori (*Porphyra spp.*), Dead Man's Fingers (*Codium fragile*), Sea grapes (*Botryocladia pseudodichotoma*), and Elk kelp (*Pelagophycus porra*). Landside locations may include additional shellfish and seaweed species not able to be permitted in-water, as closed recirculating aquaculture systems (RAS) offer additional flexibility and ability to carefully control culture conditions without interaction with the local environment.

Gear used to support shellfish and seaweed aquaculture are made from marine-grade, UV resistant materials. More information about aquaculture gear can be found in **Appendix A** and *NOAA's Technical Guide to Marine Aquaculture Gear.*

8

Benefits of Participating in the SSAP

8 Benefits of Participating in the SSAP

With the purpose to support and facilitate future shellfish and seaweed aquaculture in and around San Diego Bay, the District is developing this program to provide more transparent and streamlined permitting and approval processes and to establish expectations of the process for future operators, alleviating some of the hurdles that have been experienced by the industry in California over the last 30 years (see **Section 3** for more information about industry barriers to entry). While hurdles may still exist, the District is committed to preparing a program that provides unique benefits to future SSAP operators, supporting all aspects of the industry. These include:

- Permitting expertise, assistance, and support
- Reduced financial burden from costly environmental reviews and permitting processes
- Guidance on stakeholder engagement throughout the permitting process
- Regional and industry knowledge
- Access to marketing support to help grow industry locally, state-wide, and nationally
- Access to local workforce development programs
- Partnerships with research institutions and Blue Economy Incubator companies to promote industry innovation
- Vertically integrated operations via access to upstream, grow out, and downstream activities within the SSAP, reducing transportation costs and environmental impact

Aside from reducing the barriers to entry for future operators, the District recognizes that shellfish and seaweed aquaculture provides a wide array of environmental, economic, and social benefits, making them valuable tools for supporting sustainable coastal development and marine conservation. Environmentally, these forms of aquaculture can contribute significantly to water quality improvement, bioremediation, and ecosystem restoration. Shellfish such as oysters and mussels filter water as they feed, removing excess nutrients,

bacteria, and contaminants from the water column that can lead to harmful algal blooms and beach closures (Filippini et al., 2023). Seaweed, such as giant kelp and sea lettuce, can absorb carbon dioxide and organic pollutants like nitrogen and phosphorous, helping to mitigate ocean acidification and eutrophication (Kim, et al., 2015, Gentry et al., 2020, Bews et al., 2021). Farms can also create structurally complex habitats, increasing biodiversity and augmenting wild populations. For example, farms can create refuge from predators and serve as a nursery habitat for young fish, leading to an almost two-fold increase in fish abundance on farm sites compared to other habitats (Barrett et al., 2022). Additionally, shellfish and seaweed aquaculture can help restore lost or damaged ecosystems, replenishing native oyster populations and aiding in the regrowth of essential kelp forest habitat (The Nature Conservancy, 2023).

Economically, shellfish and seaweed aquaculture offer a multitude of valuable product and market opportunities (see **Section 5.1**) as well as ecosystem services. The monetary value of nitrogen removal is estimated to be $1,321-$7,739 per acre per year for shellfish and $753-$10,110 per acre per year for seaweed (Barrett et al., 2022). Enhanced fish habitat creation adds $618-779 per acre per year in value to commercial and recreational fisheries. Bioremediation of contaminated coastal waters may reduce the incidence of beach closures due to health hazards, giving a major boost to local tourism economies that are dependent on beach access. Coastal aquaculture can also support local economic development and working waterfronts by creating jobs, supporting workforce development programs, and offering new opportunities for ecosystem service payments and blue natural capital trading credits. Additionally, these crops are low-input, requiring no feed, fresh water, or fertilizer, making them among the most environmentally sustainable sources of animal protein production (Gentry et al., 2020).

Socially, shellfish and seaweed aquaculture contribute to food security by providing locally produced, scalable seafood production options, complementing wild fisheries and providing diversification options for industry practitioners. They support traditional livelihoods and indigenous practices, promote gender equity, and offer cultural and educational value through community engagement and ecotourism (Barrett et al., 2022). Shellfish and seaweed aquaculture can deliver the greatest societal benefits by improving the quality of the environment and human health, providing nature-based solutions to challenges such as pollution, climate change, and coastal degradation (Theuerkauf et al., 2019).

9 SSAP Preparation

9 SSAP Preparation

Prior to implementation, there are several steps for SSAP approval. These include stakeholder engagement, the preparation of Discussion Drafts, environmental analysis under CEQA, Board of Port Commissioners (BPC) approval, and establishing a process for approving changes to the SSAP over time.

9.1 SSAP Discussion Draft

The purpose of the SSAP Discussion Drafts (First Discussion Draft, 2024; Second Discission Draft, 2026) are to provide the opportunity for stakeholders and the public to provide initial feedback and comments and encourage discussion with the District and District staff on the proposed program. This occurs prior to any mandated public review period (e.g., CEQA) and helps to increase transparency between the District and the public.

The District relied upon previous studies (see **Section 6**) to prepare the SSAP Discussion Drafts. These studies informed the overall concepts for the program (e.g., optimal locations and species). Additionally, the District organized focused stakeholder meetings to further refine the program based on the input from stakeholders, which included industry experts, regulatory agencies, local elected officials, researchers, economic development and business organizations, tribal leadership, recreational groups, commercial maritime groups, fishing groups, and local Bay and ocean users.

The First Discussion Draft (District, 2024) was available for a 60-day review period from August 20, 2024 – October 25, 2024. The Second Discussion Draft is available for another 45-day review period from May 1, 2026 – June 15, 2026. Review periods allow stakeholders and the public the opportunity to review the document, review revisions made based on prior feedback from stakeholder and public engagement, and submit written comments to the District. During the review periods, the District will continue stakeholder and public engagement to encourage interested parties to review the SSAP Discussion Drafts to provide opportunities for

discussion. For this Second Discussion Draft, District staff continued focused discussions and engagement with stakeholders, which included industry experts, regulatory agencies, local elected officials, researchers, economic development and business organizations, tribal leadership, recreational groups, commercial maritime groups, fishing groups, and local Bay and ocean users.

After the Second Discussion Draft 45-day review period, the District will consider all additional comments and revise the Discussion Draft as appropriate before using it as the basis of the project description in the CEQA process.

9.2 California Environmental Quality Act

Analysis under the California Environmental Quality Act (CEQA) is a critical and required step for many projects, programs, and plans in the State of California. CEQA review serves as a process to identify and disclose environmental impacts of proposed actions, as well as implement appropriate mitigation measures. The SSAP would be reviewed under CEQA pursuant to CEQA Guidelines §15168 as a Program Environmental Impact Report (Program EIR). A Program EIR can be used to evaluate the environmental impacts associated with the adoption of plans or regulations to govern a program, in this case the District's proposed SSAP. A Program EIR allows for a general evaluation of the program's environmental impacts, thereby streamlining the environmental review associated with subsequent individual aquaculture applications found to be within the scope of the program (SSAP) described in the Program EIR. to govern a program, in this case the District's proposed SSAP. A Program EIR allows for a general evaluation of the program's environmental impacts, thereby streamlining the environmental review associated with subsequent individual aquaculture applications found to be within the scope of the program (SSAP) described in the Program EIR.

CEQA Guidelines §15168(b) Use of a Program EIR can provide the following advantages: **(1)** Provide an occasion for a more exhaustive consideration of effects and alternatives than would be practical in an EIR on an individual action, **(2)** Ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis, **(3)** Avoid duplicative reconsideration of basic policy considerations, **(4)** Allow the lead agency to consider broad policy alternatives and program wide mitigation measures at an early time when the agency has greater flexibility to deal with basic problems or cumulative impacts, and **(5)** Allow reduction in paperwork.

CEQA Guidelines §15168(c) state that later activities in the program must be examined in the light of the Program EIR to determine whether an additional environmental document must be prepared.

(1) If a later activity would have effects that were not examined in the Program EIR, a new Initial Study would need to be prepared leading to either an EIR or a Negative Declaration. That later analysis may tier from the Program EIR as provided in §15152.

(2) If the agency finds that pursuant to §15162, no subsequent EIR would be required, the agency can approve the activity as being within the scope of the project covered by the Program EIR, and no new environmental document would be required. Whether a later activity is within the scope of a Program EIR is a factual question that the lead agency determines based on substantial evidence in the record. Factors that an agency may consider in making that determination include, but are not limited to, consistency of the later activity with the type of allowable land use, overall planned density and building intensity, geographic area analyzed for environmental impacts, and covered infrastructure, as described in the Program EIR.

(3) An agency shall incorporate feasible mitigation measures and alternatives developed in the Program EIR into later activities in the program.

(4) Where the later activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were within the scope of the Program EIR.

(5) A Program EIR will be most helpful in dealing with later activities if it provides a description of planned activities that would implement the program and deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed project description and analysis of the program, many later activities could be found to be within the scope of the project described in the Program EIR, and no further environmental documents would be required.

Analysis under CEQA is anticipated to include consideration of all 20 environmental topics listed in CEQA Guidelines Appendix G, as well as cumulative impacts, mitigation measures, growth inducement, alternatives, and all aspects included in CEQA Guidelines §§15120-15132. The CEQA process will provide additional opportunities to solicit public and stakeholder input.

It is anticipated that a Program EIR will be prepared for the SSAP. This process would commence with public scoping, including release of a Notice of Preparation (NOP) for a 30-day period to solicit input from agencies and the public as to the content, or scope, of the Program EIR. A public scoping meeting will be conducted during that 30-day period, and all comments received will be considered in the development of a Draft Program EIR. The Draft Program EIR itself will be made available for a minimum 45-day public review period during which time agencies and the public may provide comments addressing the adequacy of the Draft Program EIR. A revised Draft SSAP would be included as an attachment or appendix to the Draft Program EIR. After public review of the Draft Program EIR, the District will prepare a Final Program EIR, which will include responses to public comments received and revisions to the Draft Program EIR, as needed. The Final Program EIR will be made available no less than 10 days before a hearing of the BPC to certify the Program EIR.

9.3 BPC Approval

The approval of the SSAP would be considered by the BPC once the Final Program EIR is certified by the BPC. If approved, the SSAP would be memorialized by a BPC resolution, with subsequent adoption of a BPC Policy or Ordinance to enable SSAP implementation. If the Program EIR for the SSAP is certified, a Mitigation Monitoring and Reporting Program and written checklist would both be affixed to the SSAP.

9.4 SSAP Updates or Changes Over Time

When appropriate, the SSAP may be updated to meet changing conditions, best available science, and advancements in technology. The District may consider changes to species, growing methods, or implementation process. Future changes must be in line with the objectives and overall intent of the SSAP and may require future BPC approvals or additional environmental review, depending on the proposed changes.

9.5 Outreach

As the District develops the SSAP, public outreach and stakeholder engagement remains a key element of the program's success. District staff are holding focused discussions with various stakeholders to develop the SSAP and to better understand any concerns (e.g., siting, species selection) as well as how the SSAP can help address current challenges, and will deploy broad outreach efforts to educate the public about the program as final details come into focus. As development of the SSAP continues, outreach will continue to be a central pillar of this effort. If future changes to the SSAP are approved, public outreach and stakeholder engagement would continue to play a role in SSAP implementation as future projects are proposed or future changes to the SSAP are considered.

10

Implementation of the SSAP

10 Implementation of the SSAP

If and when the SSAP is approved, the District would be able to implement the SSAP. The purpose of this section is to outline the process for individual District approvals as shellfish and seaweed aquaculture projects are proposed through the SSAP. Please refer to **Figure 12**, which depicts an overview of the process for how future aquaculture proposals would be processed by the District. It is important to note that **Figure 12** generally depicts the process, however depending on the details of a specific proposal, the process may be modified on a case-by-case basis. Each general step identified in the flow chart is described in this section.

BPC Policy 360

BPC Policy 360 establishes a review process for development proposals to ensure that they are subject to a competitive process. This policy outlines the major steps for the District to issue a Request for Proposals for future development.

Typically, BPC Policy 360 applies to future development that would result in a real estate agreement with a term of more than five years. For the SSAP, the RFP would be inclusive of all project proposals under the program regardless of proposed duration.

10.1 Request for Proposals

Upon BPC approval of the SSAP, the District would issue a Request for Proposals (RFP) consistent with BPC Policy 360. Through this RFP, interested aquaculture operators may submit proposals to be considered for inclusion in the SSAP. The District anticipates that prospective applicants should be prepared to submit:

- a detailed description of the proposed aquaculture operations, including a list of species and gear types, engineering and mooring specifications, and project timeline and operations schedule;
- proposed SSAP location/s;
- operator qualifications;
- a description of the proposed operators' prior aquaculture experience;
- a list of any specific operational needs, as well as any constraints for the proposed operations;
- farm design and engineering plans; and
- the overall intent or purpose of the proposed operations.

As the SSAP is developed, additional information may be required as part of the RFP submission in addition to the above list. Depending on the number of applicants, the District may later determine whether additional RFPs should be issued in the future after the initial solicitation.

Once responses to the RFP(s) are submitted, District staff (including subject matter experts from departments such as Aquaculture and Blue Technology, Real Estate and Maritime) would take the lead in the review and selection of submittals for consistency with the SSAP, Port Code Section 3, and BPC Policy 360; select an operator; and make a recommendation to the BPC for consideration during a public meeting. The subject matter expert review would include determining precise sites within the identified SSAP locations, likely based on site availability, and a spatial configuration analysis that is part of an ongoing special studies that support the SSAP. All operators with BPC-approved submittals would be considered "Preliminary SSAP Operators."

10.2 Tenant Project Review Process

> **It is important to note** that this process only applies to Preliminary SSAP Operators proposing projects on District Tidelands. If submitting for a SSAP project within the Zuñiga Shoals location, please refer to **Section 11.1.**

Preliminary SSAP Operator proposals would then be processed by the District similar to other prospective or current tenant project proposals. The Tenant Project Review Process was recently updated and approved by the BPC in Spring 2024 via a Port Code amendment to establish a well-defined and consistent process with requirements for processing tenant projects on District Tidelands.

> The District is committed to relieving procedural burdens that have historically hindered aquaculture projects. There are dedicated District staff who understand the SSAP and District processes who are available to discuss any project-specific questions with Preliminary SSAP Operators.

An outline for the procedural steps for Tenant Project Review for Preliminary SSAP Operators is summarized in **Figure 12**. Below each step is a brief narrative that generally summarizes what it might entail and the involvement of the District and Preliminary SSAP Operators:

- Preliminary Project Review
  - This step would be led by District staff, with participation from Preliminary SSAP Operators. It would likely include a presentation to the BPC to solicit feedback from Commissioners on the proposed aquaculture operations, and to obtain BPC direction for advancing the project to the next step of the process including additional environmental review. It is important to note that this step is not considered an approval.

Per Port Code Section 3:

"Section No. 3.02 – Preliminary Project Review

(a) Reviewing Authority. The Reviewing Department[3] shall determine whether the activity will be subject to Preliminary Project Review as described below.

1. Required - Preliminary Project Review is required if the activity may require a CEQA document (Environmental Impact Report (EIR) or Subsequent or Supplement EIR, Mitigated Negative Declaration (MND) or Subsequent MND, or Negative Declaration and at least one of the following:

a. BPC approval of a Coastal Development Permit (CDP) or a material amendment to an already approved CDP, or

b. BPC approval of an amendment to the Port Master Plan.

2. Requested – Staff Discretion to Request Preliminary Project Review. For an activity that does not meet the requirements above, the Director of the Reviewing Department may seek Preliminary Project Review for any reason including but not limited to regional impacts, cost, public profile, security, or any combination thereof.

3. Not Required – Staff Review and Approval Only. For all other activities not subject to Preliminary Project Review, Applicant shall proceed to Pre-Application Coordination."[4]

3 "Reviewing Department" may include but not be limited to the Aquaculture and Blue Technology, Real Estate, Maritime, and Planning departments.

4 For the most current Port Code text, please visit the Port's webpage: https://www.portofsandiego.org/public-records/administration/san-diego-unified-port-district-code.

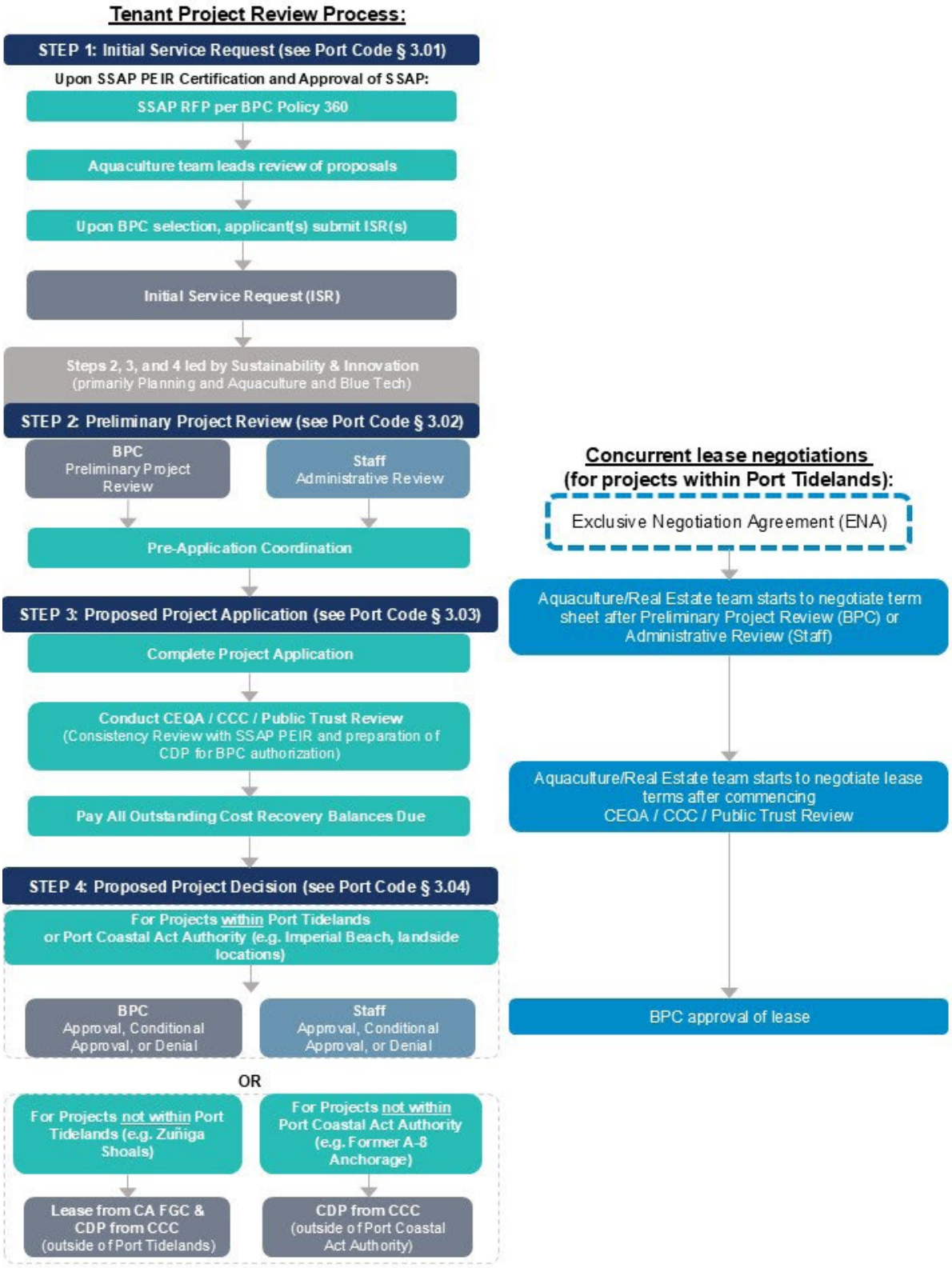


Figure 12. Overview of proposed District processes for future aquaculture operations located in-water and landside proposed through the SSAP. This figure depicts the general process; there may be modifications to the process depending on the details of a specific proposal.

- Application Coordination
  - This step would include discussions between Preliminary SSAP Operators and District staff to ensure completeness of a Tenant Project Application, which is a standard package that all District tenants submit for review of a project. The application would require Preliminary SSAP Operators to provide information about their business or operation, and any other information or materials necessary to evaluate the project for consistency with applicable rules and regulations, including but not limited to the SSAP. This would involve identifying further details about the aquaculture proposal, a cost recovery schedule, and any specific requirements or needs for the proposed operations, such as berthing/mooring needs. Then the Preliminary SSAP Operator would submit the application and District staff would assess it for completeness.
- Conduct CEQA, Coastal Act, and Public Trust Review
  - Projects proposed within the PMP. This step would be led by District staff, with participation from Preliminary SSAP Operators. It would include reviewing the proposed aquaculture operator's project application for consistency with the certified SSAP Program EIR, as well as preparing a CDP (if applicable) for the proposed operations. This step is when the applicable Mitigation Measures from the SSAP Program EIR would be applied for a specific proposal, as well as applicable Special Conditions for a District-issued non-appealable CDP based on the specific proposal. Public Trust review includes reviewing the proposed operations for consistency with the policies, water and land use designations, and other applicable standards established in the District's certified PMP and Port Act.

It is important to note that Coastal Act review *by the District* only applies to projects proposed in locations that have been incorporated into the District's certified PMP. If submitting for a SSAP project at Zuñiga Shoals or the Former A-8 Anchorage, please refer to **Section 11.1** and **Section 11.2** for more information on Coastal Act review for those locations.

Pursuant to CEQA Guidelines §15168(c), the District will use a written checklist or similar device to document its evaluation of future applications/proposals to determine whether the environmental effects of the proposed project are within the scope of the Program EIR. If it is determined that a future project would have impacts that were not examined in the Program EIR, an Initial Study will be prepared, leading to preparation of either a subsequent EIR or a negative declaration for the proposed project. That later analysis may tier from the Program EIR as provided in CEQA Guidelines §15152. If the environmental effects of a future application/project were adequately addressed in the Program EIR and the District finds that none of the circumstances requiring subsequent environmental review under CEQA Guidelines §15162 have occurred, the District can approve the activity as being within the scope of the program covered by the Program EIR, and no new environmental impact analysis pursuant to CEQA would be required. The District may also consider approval of an addendum to the Program EIR pursuant to CEQA Guidelines §15164 if some changes or additions are necessary but none of the conditions described in CEQA Guidelines §15162 calling for preparation of a subsequent EIR have occurred.

Coastal Development Permits (CDP) for sites within the District's permitting authority: There are four categories of development in the Coastal Zone: appealable, non-appealable, excluded, and emergency. The types of appealable development are listed in §30715 of Chapter 8 of the Coastal Act and do not include the types of development relevant to the SSAP. All development proposed within wetlands, estuaries, or "existing recreation areas," as delineated in the original 1975 Coastal Plan (Coastal Plan–delineated development), must also comply with Chapter 3 of the Coastal Act. All other types of development that do not qualify for an exclusion from a CDP or an emergency CDP are non-appealable, and must be consistent with the Port Master Plan, including policies required for consistency with Chapter 8 of the Coastal Act. Depending on the scope of an application, an individual CDP would likely be needed for each project under the SSAP.

- Proposed Project Decision
  - This step would be led by District staff, with participation from Preliminary SSAP Operators. It would likely involve a final presentation to the BPC during a public meeting requesting consideration of a staff recommendation of "approval" or "denial." If the BPC approves the project, then applicants would officially be considered "SSAP Operators" and the project may commence upon receipt of any and all other required regulatory approvals. Approval of the project would likely also include approval of a Real Estate Agreement (e.g., lease), any additional CEQA documentation (if applicable), and a District-issued non-appealable CDP (if applicable and only for projects proposed within locations incorporated into the District's certified PMP). If the BPC denies the project, then the application cannot move forward. The District would be responsible for enforcement of lease and CDP conditions and terms, and monitoring of any approved projects.
- Changes to an SSAP Operator's Approved Project
  - This step would be led by an SSAP Operator with subsequent review by District staff. Should any components of the project as approved change, it would be the SSAP Operator's responsibility to notify District staff of these changes so that the District can review them for conformance with the prior approvals. Depending on the scale of the changes, additional review processes may be required.

The above steps include a version of the Tenant Project Review Process tailored for the SSAP. The complete version of the Tenant Project Review Process is available in Section 3 of the San Diego Unified District Port Code.

Per Port Code Section 3

"Section 3.04 – Proposed Project Decision

(a) Processing a Complete Project Application. Following receipt of a Complete Project Application, the Reviewing Department shall process it in accordance with all applicable District policies, procedures, and practices as well as all laws including but not limited to CEQA and the Coastal Act (including preparation of a CEQA document, Port Master Plan Amendment, or Coastal Development Permit as may be required), and ordinances adopted pursuant thereto, in addition to all other lawful requirements.

(b) Discretionary Approval, Conditional Approval, or Denial. Once the Reviewing Department has completed its review and all CEQA review has been completed and approved, the Reviewing Department shall do one of the following:

1. If Board review is required, then Staff shall present their recommendations regarding the Proposed Project to the Board for discretionary approval, conditional approval, or denial which may include, but not be limited to, approval or adoption of a Port Master Plan Amendment, authorization of a CDP or material CDP Amendment, or other discretionary approvals.

2. If Board review is not required, then Staff shall approve, conditionally approve, or deny the Proposed Project.

(c) Written Approval or Denial of Proposed Project. All determinations made by the Reviewing Department, or the Board shall be communicated in writing to the Applicant. A Proposed Project that is approved or conditionally approved shall become an Approved Project and shall submit progressively detailed drawings and information as may be required by the Reviewing Department."[5]

5 For the most current Port Code text, please visit the Port's webpage: https://www.portofsandiego.org/public-records/administration/san-diego-unified-port-district-code.

10.3 Stakeholder Engagement

Prior to any formal District approvals, Preliminary SSAP Operators and/or future applicant/tenants are expected to engage with the District on stakeholder engagement, which is a central tenet of the SSAP. Early, frequent, and meaningful engagement will be an important component to the process when individual projects are proposed through this program. Engagement with stakeholders including but not limited to re-source agencies, Bay users, and the community will help keep others in the region in-formed on upcoming aquaculture proposals, understand early if there are any conflicts with the proposal and other uses, and identify solutions to address comments or challenges with the proposal.

10.4 Real Estate Agreements.

It is important to note that this process only applies to Preliminary SSAP Operators proposing projects on District Tidelands. If submitting for a SSAP project within the Zuñiga Shoals location, please refer to **Section 11.1.**

After Preliminary Project Review, the District and Preliminary SSAP Operators would concurrently commence negotiations for associated Real Estate Agreements for the proposed aquaculture operations. The District anticipates that most SSAP Operators would be issued leases; however, there are other shorter-term real estate agreement options (five years or less), such as Tidelands Use and Occupancy Permits (TUOPs), depending on an operator's project needs. Negotiation of lease terms would include leasing costs, specific use rights and limitations, and any other terms specific to the proposed location and proposed project activities. Depending on the scope of the proposal and implementation timeline, the District and a Preliminary SSAP Operator may enter into an Exclusive Negotiation Agreement (ENA).

BPC Policy 355

The Real Estate Leasing Policy (BPC Policy 355) and its associated Administrative Practices – Real Estate Leasing establishes real estate leasing policies for the District and the practices and procedures used in establishing these agreements. There are two types of leases described in BPC Policy 355:

Short-term Leases – These include Tidelands Use and Occupancy Permits (TUOPs), rental agreements, easements, licenses, or other similar types of agreements for terms of five years or less in duration. The District's President/CEO may enter into these short-term lease agreements without BPC approval.

Long-term Leases – These include real estate agreements for more than five years in duration. All long-term leases must be presented to the BPC for approval in a public meeting.

10.5 Operations Plan

Through the approval process for proposals submitted through the SSAP, the District will require operators to prepare Operations Plan(s) that will detail Best Management Practices, lease terms, conditions, and other information necessary to demonstrate consistency with the SSAP. Additionally, Operation Plans will include mitigation measures resulting from the certified Program EIR monitoring requirements, and other regulatory permit conditions. The Operations Plan is meant to be a comprehensive resource, which will be provided to the appropriate District reviewing authority when considering approval of a specific proposal; however, it is also a living document that may be updated by operators and/or the District in concert with regulatory agencies. Potential updates, subject to District review and approval, may include changes to growing area determinations, project permit conditions and changes within District policy. The list below summarizes examples of what types of categories would be considered for inclusion within the Operations Plan, although it is not intended to be an exhaustive list. Project-specific and site-specific considerations would factor into determining which practices would apply to an individual operation.

Best Management Practices

Shellfish and seaweed aquaculture established through SSAP will comply with all related mandates and regulations from a federal, state, and local level. Furthermore, in-water and onshore sites within the District's jurisdiction are also subject to best management practices and mitigation utilized by the District.

Marine Wildlife Impacts – Best management practices to reduce adverse impacts to marine wildlife include marine mammals, sea turtles, birds, and other sensitive species. These practices may include but not be limited to the development and implementation of a marine entanglement plan including prevention of entanglement, participation in marine wildlife education programs, and instructions to mariners to avoid marine mammals and sea turtles and to follow all regulations regarding interactions.

Ecological Concerns – Best management practices will address several ecological concerns and will work to prevent adverse impacts from occurring. This includes interactions with sensitive habitats, predator control, gear management, and management of invasive species.

Biosecurity Concerns – Best management practices will employ procedures that will minimize the risk of introducing harmful or infectious agents into farms and facilities. To achieve this, Operation Plans will include protocols for importing healthy seedstocks, preventing, reducing, or eliminating pathogens, and personnel training of biosecurity principles and compliance.

Military Readiness – Best management practices may need to consider nearby military operations and potential risks to aviation safety to maintain mission alignment between U.S. Navy and District operations. The District will provide guidance to operators to minimize bird airstrike hazards (BASH) which may include, but not be limited to, coordination with military BASH programs, strategic farm design and operations, use of non-lethal deterrents, and habitat management.

Marine Debris – Best management practices for addressing marine debris from aquaculture will focus on prevention, mitigation, and retrieval. Operators will be encouraged to utilize strong, resilient materials, conduct regular inspections, mark all equipment, and retrieve dislodged gear.

Monitoring Plans

The District is committed to preserving and improving the diverse natural resources in and around San Diego Bay and regularly coordinates localized and bay-wide monitoring efforts to gauge the status of natural resources including eelgrass beds, bird and fish surveys, and sensitive and/or endangered species. Additional monitoring plans will be developed, by operators, as needed on a case-by-case basis depending on the scale and particular characteristics of the proposed aquaculture project. As part of project review, permitting, and approval, the District will review Monitoring Plans in coordination with other permitting agencies to evaluate potential adverse environmental impacts to address areas where there is a lack of data or information on potential ecological interactions.

Eelgrass

Adverse effects to eelgrass will be carefully assessed and monitored throughout all aquaculture operations. Whenever possible, eelgrass will be avoided by aquaculture gear and anchors. For aquaculture projects proposed to be in close proximity to existing eelgrass beds, a specific monitoring plan will be developed to evaluate project impacts and implement any required mitigation in compliance with the California Eelgrass Mitigation Policy (NMFS, 2014).

Vessel Use

All vessels employed for aquaculture activities, including construction, harvesting, surveys, maintenance, and decommissioning, are subject to regulations regarding local marine wildlife. Additionally, the operator will take precautions to prevent spills and will be responsible for safe and appropriate fueling procedures. Vessel operators will be encouraged to minimize artificial lighting and nighttime usage, and to utilize energy efficient motors maintained in a manner that minimize greenhouse gas emissions as well as adverse impacts of underwater noise. Prior to farm or aquaculture installation, mariners will be given public notice in the U.S. Coast Guard Local Notice to Mariners (LNM) and the aquaculture area will be marked and visible.

Decommissioning Plan

Operators within the SSAP must submit and adhere to a plan detailing how gear will be removed when operations cease. Accommodations may be made if another lessee will assume operations in that exact project site. Plan elements include but are not limited to:

- Notice to the District of discontinuing operation and timing for dismantling facilities.
- Details on method of removal of operational equipment, including but not limited to anchors, lines, gear, and product, and returning the site to pre-development conditions.
- Proof of adequate bonding to cover decommissioning activities.

10.6 Additional Permits and Approvals

In addition to District approvals, other discretionary approvals or permits from other agencies may include:

- USACE §10 Rivers and Harbors Act Permit – all in-water locations (NWP 48 [Shellfish] or 55 [Seaweed])
- USACE §404 Clean Water Act Permit – all in-water locations (NWP 48 [Shellfish])
- RWQCB San Diego Region (9) §401 Clean Water Act Certification – all in-water locations and any discharges from landside locations
- California Department of Fish and Wildlife Aquaculture Registration
- California Department of Public Health – shellfish
- USACE §10 Rivers and Harbors Act/ §404 Clean Water Act Permit for intake/ discharge approval – for all landside locations that would include an intake/ discharge system (NWP 7 for USACE permit)
- Additional non-discretionary approvals may be needed for landside locations such as Building and/or Demolition permits to ensure compliance with building codes from the City within which the project is located

As one of the benefits of participating in the SSAP, the District would offer permitting expertise and assistance to SSAP Operators to navigate both District and other agency approval processes.

10.7 Annual Reporting

As the SSAP is implemented and the portfolio of aquaculture operators participating in the program expands, District staff will provide annual reports to the BPC. These reports will provide the status of the SSAP. Key metrics to be included in annual reporting may include:

- Number of SSAP operators and area of in-water and landside space being leased to SSAP operators,
- Types of shellfish and seaweed species being cultivated and the gear types utilized,
- Environmental indicators, such as amount of carrying capacity of each site being utilized,
- Compliance with SSAP requirements and any violations and/or enforcement actions,
- Any proposed modifications or adjustments to SSAP requirements, processes, or conditions,
- Other requirements as specified in District policy (e.g., standard Real Estate requirements).

These reports will likely require input from SSAP operators, however annual reporting would be about the status of the SSAP as a program and would not focus on the details or specifics from a single operator. Annual reporting would begin once the SSAP reaches five SSAP operators.

11

Location Considerations for In-Water Areas

11 Location Considerations for In-Water Areas

The SSAP is a District program to support and facilitate shellfish and seaweed aquaculture in and around San Diego Bay. While most of the locations that are proposed in the SSAP are within District Tidelands, there are two in-water locations (Zuñiga Shoals and the Former A-8 Anchorage) that would be subject to different permitting pathways than the process outlined in **Section 10.**

> All proposed operations within landside locations would follow the SSAP process outlined in **Section 10.**

11.1 Zuñiga Shoals

Through the NOAA-NOS-NCCOS analyses, the Zuñiga Shoals location was identified as a prime area to support future shellfish and seaweed aquaculture. While this location is not within District Tidelands, the District has an interest in this area as it has formalized partnerships with adjacent jurisdictions as well as federal and state partners to monitor and enforce mooring restrictions and environmental enhancement (e.g., study and protect eelgrass beds).

Prospective SSAP operators interested in pursuing aquaculture at Zuñiga Shoals must receive an aquaculture lease(s) for the use of the State water bottom area from the California Fish & Game Commission. In addition, because this area is not within District Tidelands and thus not incorporated into the District's certified PMP, prospective SSAP operators must also receive a CDP(s) from the California Coastal Commission to operate any aquaculture activities at Zuñiga Shoals.

11.2 Former A-8 Anchorage

The Former A-8 Anchorage is another location that was identified with high potential to support future shellfish and seaweed aquaculture. This location was included in a larger submerged lands grant to the District from the California State Lands Commission in 2020 through Senate Bill 507. These additional submerged lands are now managed by the District; however, they have not yet been incorporated into the District's certified PMP. Until a PMP Amendment for these submerged lands has been certified by the California Coastal Commission, the District has leasing authority over the area but does not have Coastal Act authority. Thus, the District can issue a lease or other real estate agreement for future proposed shellfish and seaweed aquaculture within the Former A-8 Anchorage, but at this time, SSAP Operators would have to receive a CDP(s) from the California Coastal Commission to operate any aquaculture activities at the Former A-8 Anchorage.

SB 507 and the Trust Lands Use Plan

Pursuant to Senate Bill 507, in 2020, the California State Lands Commission granted over 8,000 acres of submerged lands within San Diego Bay to the District's management. As part of the legislation, the District was required to prepare and submit a Trust Lands Use Plan (TLUP) for the newly granted area. The TLUP provides goals, policies, and information on allowable uses and activities within the planning area and must describe any proposed development, preservation, or other use of the trust lands. On December 9, 2025, the BPC unanimously adopted the Mitigated Negative Declaration (CEQA document) prepared for the TLUP, approved the Final Draft TLUP, and directed the filing of the Final Draft TLUP as a Port Master Plan Amendment (PMPA) for certification with the Coastal Commission. Upon certification, the District would then have Coastal Act Authority to review proposed development for consistency with the Coastal Act within these submerged lands.

APPENDIX

A

Common Gear Associated with Growing Shellfish and Seaweed

APPENDIX

A

Common Gear Associated with Growing Shellfish and Seaweed

Cultivation methods for both shellfish and seaweed often use the same or similar gear in modified configurations. Depending on the source, gear and cultivation methods may have different colloquial names.

Briefly, the following list outlines basic gear types and common specifications to be used in various culture methods. While these are the most commonly used gear types and configurations that the District anticipates being considered for the SSAP, they do not constitute an exhaustive list of all possibilities. Other gear types and aquaculture methods not listed below may also be considered through the SSAP if found to be generally consistent with the sustainable intentions of the SSAP.

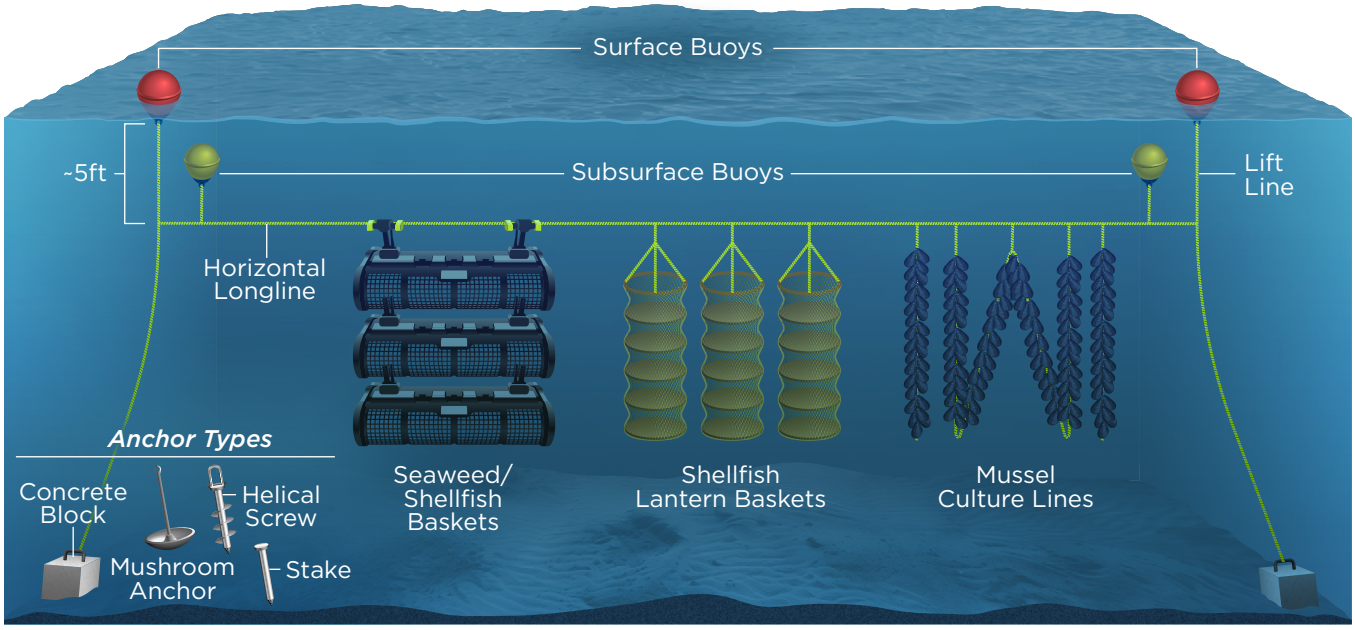


Figure A1. Example of a horizontal longline configuration with various shellfish cultivation techniques.

Horizontal "backbone" Longline

This longline is commonly used as the backbone in many systems and consists of a thick polypropylene rope that is typically attached to an anchoring system and simultaneously suspended with a network of surface and subsurface buoys. The backbone longline is suspended approximately 1.5 – 3.0 m (5 – 10 ft) below the surface of the water and is typically between 30 – 60 m (100 – 200 ft) long. It can be used along the surface of the water for various gear attachment methods including dropper lines, baskets, bags, or with any combination of these. See **Figures A1–A5** for examples of the longline method.

Anchors and stakes

Generally, an anchoring system would provide overall support, moor the system to the bottom, and connect to a backbone longline either directly or with supporting lines. There are a variety of anchor and stake types, and use would vary based on culture methods employed and environmental conditions. Concrete block anchors are commonly used in shallower or intertidal systems, or where there are hard/rocky bottom conditions. Mushroom anchors are mid-weight, metal anchors used for soft bottom systems. Helical screw anchors (or spiral anchors) are large screw-shaped shafts that are drilled into the seafloor using specific equipment and methods. Stakes are used to support the longline between anchors. See **Figures A1–A5** for examples.

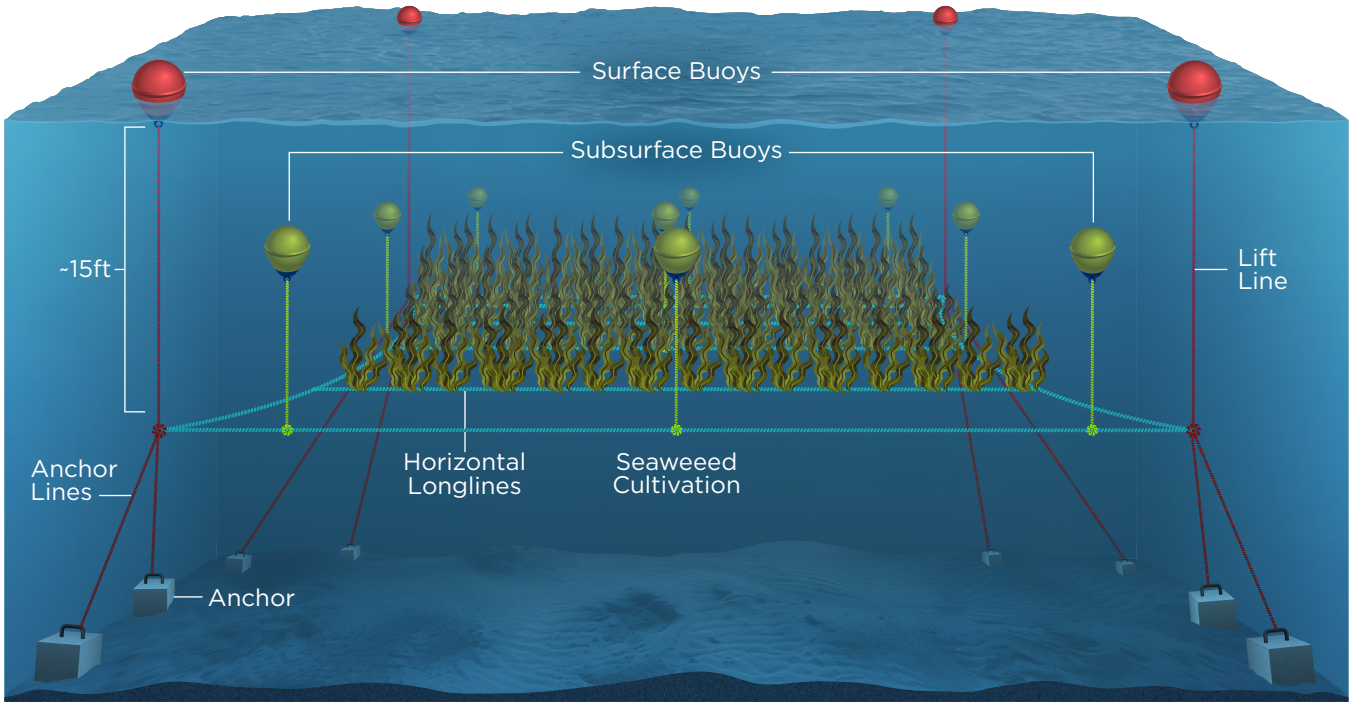


Figure A2. Example of a catenary array for seaweed cultivation.

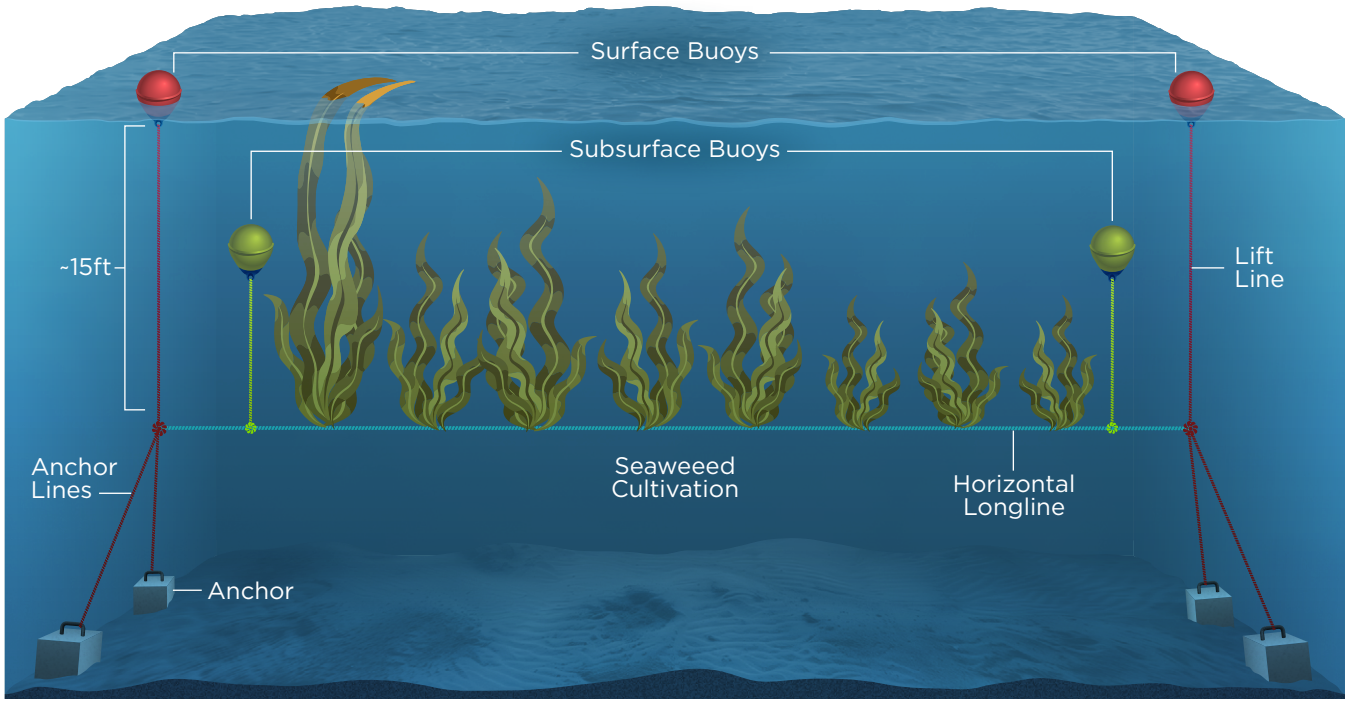


Figure A3. Example of seaweed cultivation utilizing a horizontal longline system.

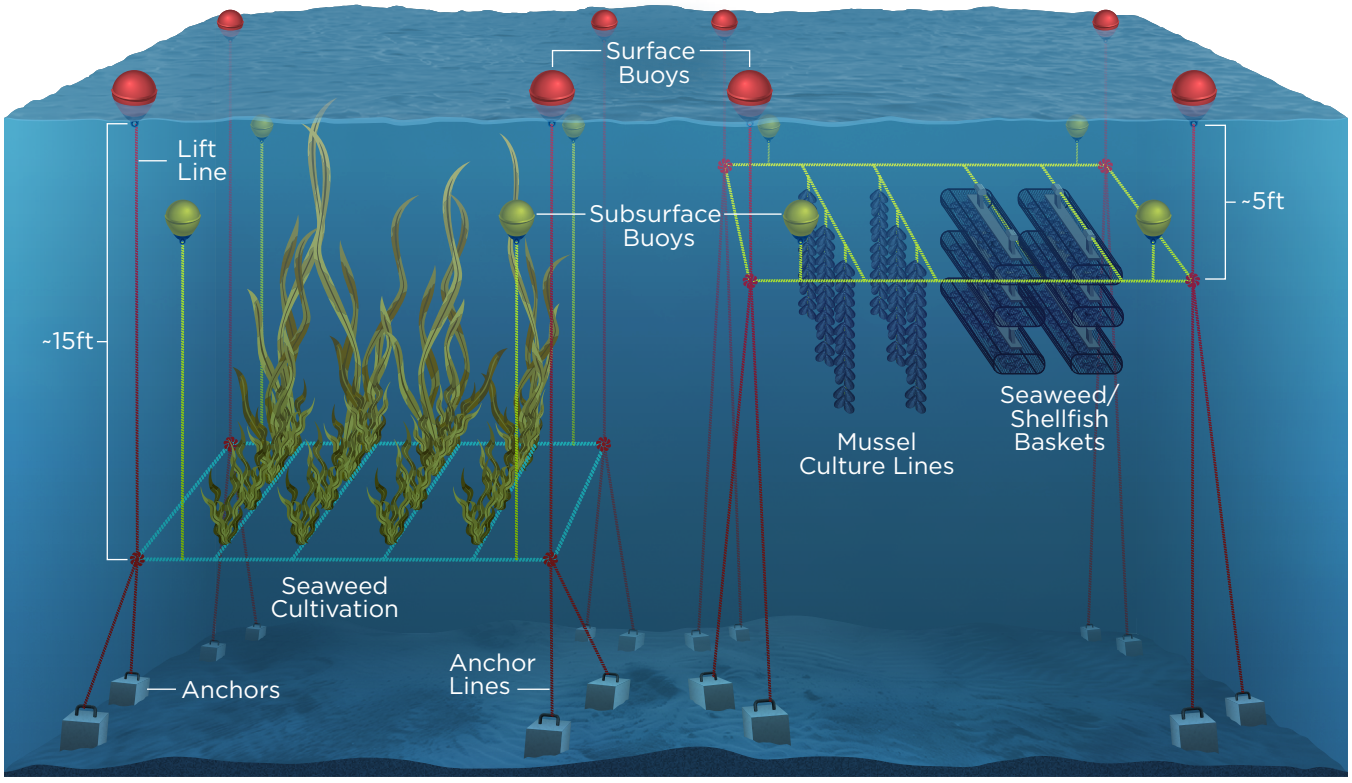


Figure A4. Example of various anchors and stakes, along with a mooring line attached to two different types of buoys. Example of growing seaweed and shellfish together on the same farm site.

Mooring/Anchor Lines

Either rope or chain lines will be installed to attach the anchors to the horizontal, or "backbone" longlines. Intermediate anchors, and associated lines may also be installed along the horizontal longline between the two end anchors for stability. Additional moorings could be installed for boats to attach to during operation and/or maintenance. Anchors and lines would be installed using a specific vessel containing specialized workboat equipment. See **Figures A1–A5** for examples.

Surface and Subsurface Buoys

Buoys provide support for the lines and gear and create appropriate tension for the culture method. Surface and subsurface buoys (~5-10 ft below the surface) will comply with federal, state, or local requirements. This includes proper visibility, reflective materials, and/or signage, as necessary to identify the location, to provide physical support of the gear and product, and for navigational safety. Large surface buoys in conjunction with smaller subsurface buoys can be used to support the backbone line, and smaller buoys can provide flotation to baskets or bags as well. Buoys need to be continually adjusted and assessed as the shellfish and seaweed grow and the mass within the system changes. Depending on their purpose, placement, and oceanographic conditions, buoys can range in size. For operations within the SSAP, the District will determine appropriate sizes based on farm siting modeling analysis. See **Figures A1–A5** for examples.

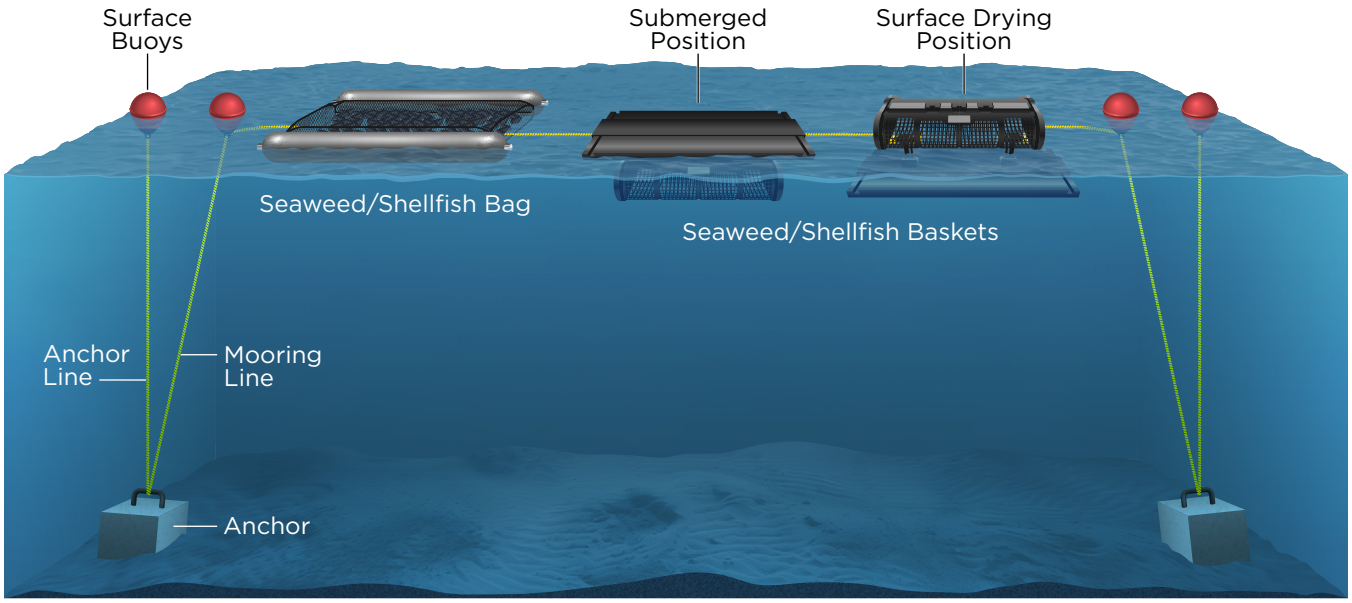


Figure A5. Example of floating shellfish bags attached to an anchor and mooring line.

Dropper lines

Dropper lines are draped or hung from the backbone longline at incremental distances and often have weights at the bottom of the line to maintain vertical orientation. Dropper lines may consist of cultivation rope with mussels seeded directly upon it or may support hanging gear, such as cages or baskets. **See Figures A1 and A4.**

Baskets

Baskets are typically made with hard marine-grade, UV-resistant plastic and have mesh sizes ranging from 3 – 20 mm (0.12 – 0.90 in). They are often cylindrical and have an approximate dimensions of 73.2 x 27 x 14 cm (29 x 11 x 5.5 in). The baskets are either supported in the water by fixed structures or longline systems, or they are connected to floating horizontal longline systems, which allows the baskets to stay at the top of the water column and move with the tides. Baskets are generally open on one or both ends and can be secured to the line by clips. **See Figures A1, A4, and A5**.

Bags

Bags are generally marine-grade, UV-resistant plastic mesh containers with a diamond or square pattern that are malleable but maintain their shape. Individual bags are typically buoyed by foam floats and attached to a horizontal longline via removable clips. They have a flat pillow-like shape, and a common size is 1 x 0.5 x 0.1 m (3.3 x 1.6 x 0.3 ft.). **See Figures A1, A4, and A5**.

Cages/Lantern Baskets

Cages used in culture methods have a box-like or cylindrical and stacked structure (lantern nets), typically made from marine-grade plastic-coated-wire and can be suspended in the water column or rest upon the bottom. If they are suspended in the water column, each cage is attached to floats and to lateral lines which connect the cages to a main line that is anchored to the bottom. Cages can also be used to store bagged oysters and can be anchored to the bottom. Commonly used cages measure 122 x 91 x 41 cm (48 x 36 x 16 in). **See Figure A1.**

APPENDIX

B

CDPH Limited Sanitary Survey Report Prohibited Area

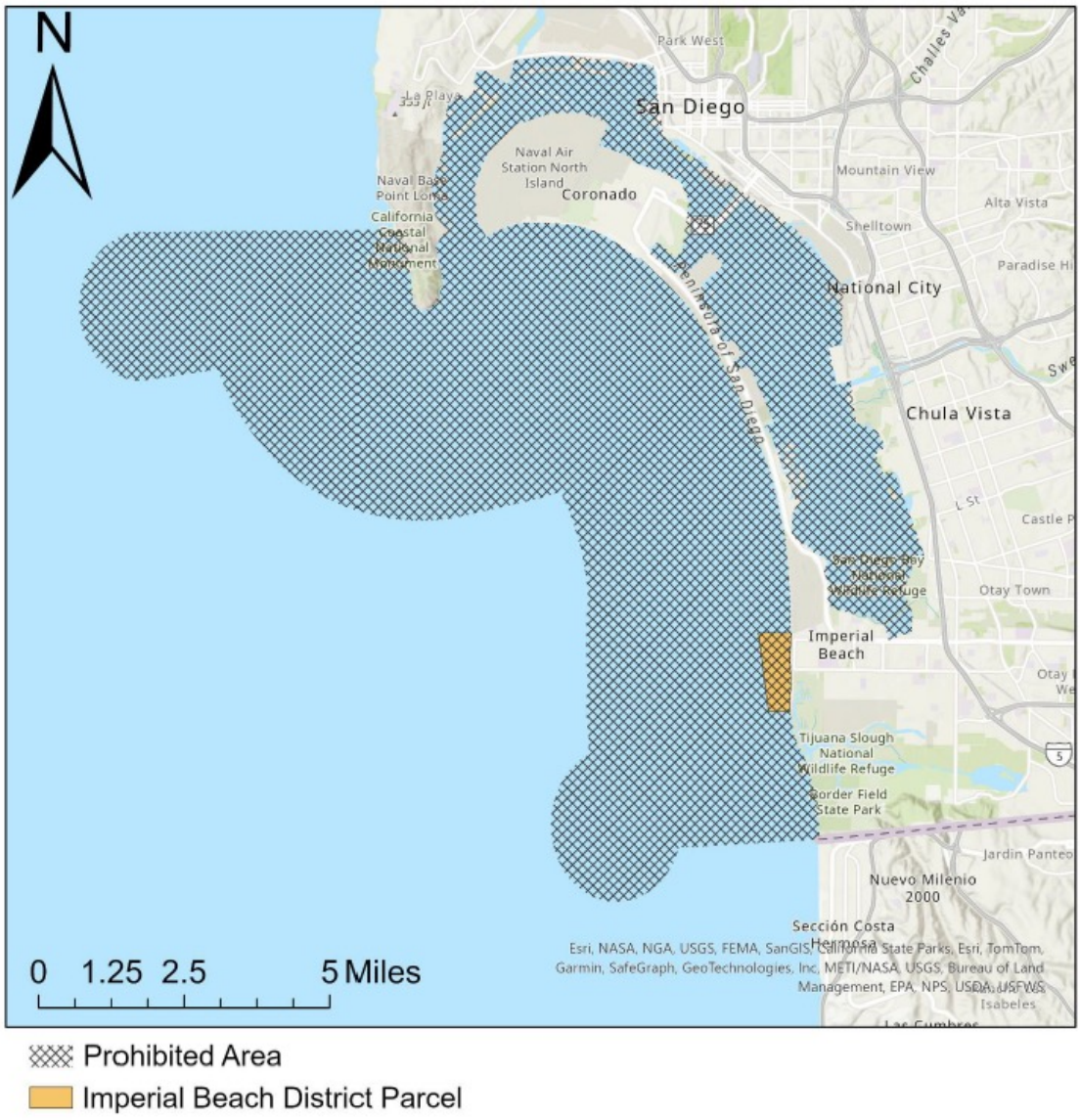


Figure B1. The Prohibited area described by the 2025 CDPH Limited Sanitary Survey Report encompasses all California state waters within the zone-of-influence of the Tijuana River, zone-of-influence of San Antonio de los Buenos Waste Water Treatment Plant, *Prohibited* area of Point Loma Waste Water Treatment Plant, ***Prohibited*** area of South Bay International Waste Water Treatment Plant, and San Diego Bay.

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