California Aquaculture

Stakeholder Views and Recommendations for Moving Marine Aquaculture Projects Forward

October 2022
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Report Purpose

CEA worked with the Aquarium of the Pacific’s (AOP) Seafood for the Future Program and other partners and leveraged previous work to gather California stakeholder views on aquaculture and identify barriers to permitting marine aquaculture. The report also recommends solutions to create a more consistent and efficient permitting process for sustainable marine aquaculture activities that support restoration, conservation, climate, research, and food production and other commercial efforts. The report summarizes stakeholder views and permitting requirements, as well as identifies possible solutions to improve the process and allow projects to move forward to maximize the environmental and economic benefits that responsible marine aquaculture can provide without compromising the integrity of regulations designed to protect environmental and social values. These recommendations are based on CEA’s research and interviews with a variety of stakeholders. The summaries of the complex permitting processes in this document and CEA’s recommendations are meant to serve: 1) as a guide to farmers or others trying to understand the processes, and 2) as a starting point for discussions of possible remedies to the identified permitting issues.

AOP will make this analysis broadly available to the public, policy makers, agency staff, farmers, and stakeholders to serve as a resource and guide to make informed decisions regarding aquaculture in California. The report will also strengthen and support other important aquaculture initiatives in California such as the California Aquaculture Action Plan, multiple restoration and conservation efforts, and NOAA’s Aquaculture Opportunity Areas.

Thanks to the Builders Initiative for funding this effort.
Scope and Definitions

This report has a limited and specific scope, and CEA chose to use specific definitions for certain terms. For the purposes of this report:

• Any mention of ‘aquaculture’ pertains only to marine aquaculture, or the farming of marine species. Fresh water aquaculture projects were not included in the analysis.

• This report and analysis primarily focuses on permitting shellfish and seaweed marine aquaculture projects in state waters (from shore to three miles from the California coast). Since finfish farms are currently not legally permittable in state waters, they are not addressed in this report. Some stakeholders from land-based facilities and finfish farms were interviewed and their insights were integrated broadly.

• There are many agency approvals (permits, consultations, etc.) that are required to conduct marine aquaculture in California. This report uses the terms “authorizations” and “permitting” to reference this spectrum of entitlements and not a single permit unless specified in the text.

• CEA had conversations with a broad array of stakeholders, and there are some projects and efforts in federal waters (beyond three miles off the coast) that were factored into the analysis, as appropriate.

• The term “research projects” in this report refers to projects where scientists seek permits for marine aquaculture so they can test and study farming methods and gear, and better understand how marine aquaculture impacts local ecosystems and species (negative and positive).

• This report focuses on activities (conservation, restoration, research, climate, and food production and other commercial projects) for which marine aquaculture is a component.
  • Many marine habitat restoration and conservation projects (e.g., living shoreline, reef balls, etc.) do not involve aquaculture and are not the focus of this report. Some of the report’s recommendations may also help move these projects forward.

• CEA recognizes the need to build consensus on definitions for conservation and restoration aquaculture. However, building that consensus is beyond the scope of this report. These terms are used throughout this document as referenced during stakeholder interviews.
Executive Summary

California will need to make significant policy changes and investments to facilitate and encourage marine aquaculture activities that will benefit the environments and the economies.
Executive Summary

There are a Variety of Marine Aquaculture Activities in California

California has and will continue to see a wide variety of marine aquaculture projects in the coming years in both state and federal waters. Types of current and future projects include:

- **Restoration/Conservation** projects to restore native species and ecosystems and provide tribal nations access to historical foods and cultural practices.

- **Climate** projects to grow seaweed to sequester carbon, produce methane reducing additives to cattle feed, or provide a low carbon additive to fuel. Others provide shoreline protection from erosion by dampening wave energy, etc.

- **Research** projects to test and study farming methods, species, and gear and better understand how marine aquaculture impacts local ecosystems and species (negatively and positively).

- **Food Production** to provide locally sourced products to meet the growing demand for seafood and support a more resilient food production sector in California and other commercial efforts (e.g., ingredients for cosmetics). **Commercial aquaculture** may include food production, climate mitigation, or other products of value and provide local economic development opportunities to communities.

Projects may have multiple intents (e.g., improve water quality and provide a product to reduce GHG emissions or restore a native species and conduct research).

* These terms are loosely defined based on discussions and research done for the purposes of this report. Clear and consistent definitions will be needed for all types of aquaculture to improve the permitting process and social license.
Executive Summary

California Aquaculture Permitting Process is Complex

- All types of aquaculture require permits and other authorizations from multiple state and federal agencies. Each agency has separate applications, data requirements, and approval processes based on their respective statutory authority.

- California permitting is unique from other states as the California Environmental Quality Act (CEQA) requires extensive analysis and mitigation of environmental impacts and a robust public process. The CEQA process takes time and is expensive.

- California does not generally have standard permit conditions, timelines, etc. for aquaculture projects due to varying regulatory authorities.

- Each project is individually considered which is time intensive and requires significant agency staff resources to evaluate site specific parameters (which vary throughout the state).

- No new California Department of Fish and Wildlife (CDFW) aquaculture bottom leases have been approved in the past two decades. Over the past seven to ten years agencies have approved updates for several existing farms and some new projects. Most new projects have been in federal waters or in areas where Ports and Harbors have jurisdiction to grant leases. One demonstration project was recently permitted in state waters.

- Despite efforts by many agencies to harmonize their statutory authorities and required mitigations, conditions, and monitoring requirements for all types of marine aquaculture, these requirements are not consistently coordinated among agencies and, in some cases, permitting pathways or regulatory requirements are not well defined.

Overview of Commercial Aquaculture Permitting Process in California Waters

**Project design phase:**
- Internal business planning
- Conversations with State Aquaculture Coordinator and other agencies

**Bottom Lease CEQA phase:**
- Submit bottom lease application
- Public interest determination
- Go through CEQA Process (likely an EIR)

**State, federal, and local permit phase:**
- Coastal Development Permit
- Health testing (shellfish)
- Navigation (Coast Guard)
- Water quality (Water Board)

**Operations phase:**
- Ongoing agency oversight
- Applicant monitoring and reporting
- Annual fees
Executive Summary

California Agency Knowledge is Increasing, but More is Needed

• While more recent permitting activity has increased agency knowledge around marine aquaculture, there is limited agency staff resources and institutional knowledge on this topic. General staff turnover and retirements will exacerbate this issue.
• Historically, there has been limited interagency communication and collaboration on aquaculture permit applications.
• Collaboration has been increasing since the Shellfish Initiative in the 2010s. A new interagency workgroup convened by the Ocean Protection Council (OPC) is encouraging coordination among California agencies, but does not include federal agencies.
• The forthcoming California Aquaculture Action Plan is creating momentum for change.
• Almost all stakeholders agreed California agencies need additional resources for aquaculture permitting activities, oversight/enforcement, and additional scientific research.

Juvenile Abalone in the Lab

Photo: Alyssa Frederick
California Can be a Leader in Sustainable Aquaculture—but Changes are Needed

- Permitting any type of marine aquaculture project in state or federal waters is complicated.
- All project types (restoration, conservation, climate, research, food production, and other commercial efforts) essentially go through the same process.
- Some marine aquaculture for stock/population enhancement involves captive breeding, and these efforts have a slightly different complicated process.
- Current permitting and oversight/enforcement pathways are not sufficiently staffed for existing projects, nor will agency staff be able to easily scale to meet an increase in demand.
- Agency oversight and enforcement activities need to be science-based, transparent, and effective.
- California needs to first develop a vision for aquaculture and then take steps to implement that vision.
- Lessons learned from other states (i.e., Alaska, Washington, Maine, etc.) and from other interagency (state and federal) efforts (i.e., offshore wind, fire risk reduction projects, etc.) provide excellent guidance on how to move forward.
- Strong science is the foundation of all aquaculture efforts and will continue to inform all marine aquaculture activities, regardless of intent (climate mitigation, species preservation, sustainable food production, etc.).
- The forthcoming California Aquaculture Action Plan is a leadership opportunity for California to develop a roadmap for how to implement sustainable marine aquaculture.
- Implementing this plan will require additional resources and strong leadership from all levels of government.
Overview of CEA Recommendations

CEA recommends the following actions to help more conservation, restoration, climate, research, food production, and other commercial aquaculture activities move forward in California. These actions could support California’s broader efforts to prioritize conservation and restoration* and strengthen resilience in the California grown food sector. Each recommendation will require substantial investments of time, energy, and resources from a variety of stakeholders to create change. The recommendations are summarized below and discussed in more detail in the following slides.

1. Garner executive, legislative, and agency leadership support for increased sustainable marine aquaculture, and develop a vision for marine aquaculture in California.

2. Develop a strong science-based California Aquaculture Action Plan that provides options, scenarios, and/or targets for a sustainable marine aquaculture portfolio that supports healthy ecosystems and communities and incorporates recommendations three through six. Use this process to create momentum for change.

3. Provide new and additional resources (staff and funding) to state agencies to review and approve an anticipated increase in proposed projects and conduct ongoing oversight and enforcement activities to ensure permit conditions are met.

4. Improve and expedite the permit process while maintaining high standards for the environment, food safety, and community well-being. Create timing and cost certainty for project applicants. Develop and implement clear and consistent oversight and enforcement programs.

5. Build agency and stakeholder trust and buy-in by increasing knowledge and awareness of the current state of aquaculture science and getting agency agreement on criteria for scientific information and research that agencies will accept to inform permitting decisions.

6. Create priority permitting pathways for projects that provide identified needs. Possible priorities include projects that contribute to restoration or conservation needs, climate benefits, economic development for disadvantaged communities, tribal nations access to historical foods, or resilience to ongoing drought conditions.

*In 2020, Governor Gavin Newsom signed an executive order to ‘implement actions to increase the pace and scale of environmental restoration and land management efforts by streamlining the State’s process to approve and facilitate these projects.’ The broader initiative is called Cutting the Green Tape.
Introduction

A broad spectrum of conservation, restoration, climate, research, and commercial activities take place under the “aquaculture” banner. These activities involve varied and complex permitting activities across dozens of state and federal agencies.
A Variety of Aquaculture Activities Take Place in California

Conservation, restoration, climate, and research aquaculture activities include species enhancement and recovery, restoration of habitat, and stock enhancement. There is also interest in growing seaweed for climate change mitigation. The lack of consensus on definitions and the efficacy of this work has hindered the development of new policies to expedite needed projects.

Current commercial activities in California include about 27 farmers (including subleases) raising a variety of shellfish and some seaweed in state waters. There are also proposals for finfish, shellfish, and seaweed farms in federal waters (outside of the three-mile state water limit).

All projects are currently guided by a robust and growing body of science that is helping guide practitioners and achieve environmental and commercial goals. Much of it comes from the California university system. As aquaculture is expanding globally, California has an opportunity to demonstrate how to implement thoughtful, sustainable marine aquaculture.

Future aquaculture projects in California will likely have a mix of goals (e.g., commercial kelp projects to reduce greenhouse gas emissions with research and conservation components). Currently, California does not have an expedited path for mixed projects that may achieve multiple state goals.
Conservation, Restoration, Climate, Research, and Commercial Activities are Interconnected

There are strong connections among all aquaculture activities. While individual projects have different goals and some methods differ (e.g., growing species for longer to improve chances for survival in the wild), they have a complex, symbiotic relationship. Commercial producers provide expertise and facilities to grow and care for broodstock designated for conservation purposes. They also share broodstock, shell (culch), and other materials with researchers or others for species conservation or restoration goals. All farmers (commercial and all other efforts) share critical knowledge and technologies that benefit multiple objectives.

Additionally, scientific efforts are informing all aquaculture activities. All types of aquaculture projects are opportunities to implement the best and most up-to-date practices, or collaborate with scientists to test equipment, techniques, etc. to improve understanding for all practitioners.

White Abalone Recovery Nexus with Commercial Efforts

Wild adult white abalone populations have declined dramatically in California due to overharvesting in the 1970s and have not recovered despite the closure of the fisheries in 1996. The existing population is large, old, and is not successfully reproducing in the wild due to low densities. Experts estimate that the wild population may go extinct in less than 20 years without intervention, and in 2001, White Abalone were listed as endangered under the federal Endangered Species Act.

While captive breeding and release projects are ongoing, these efforts need to scale-up in order to save the species. Scientists and restoration experts are still exploring ways to successfully breed as many abalone as possible, but resources are limited for researchers and NGOs to grow and restore abalone. Partnerships and collaborations between universities, NGOs, and commercial farmers to house juvenile abalone until they are of sufficient size to be out planted in the wild are critical to the success of captive breeding programs. Scientists and commercial farmers are also sharing propagation techniques to improve breeding success.

These collaborations highlight the benefit and opportunity of having healthy commercial operations to support restoration efforts essential to species recovery.
**California Aquaculture Permitting Process is Complex**

- All types of aquaculture require permits and other authorizations from multiple state and federal agencies. Each agency has separate applications, data requirements, and approval processes based on their respective statutory authority.

- California permitting is unique from other states as the California Environmental Quality Act (CEQA) requires extensive analysis and mitigation of environmental impacts and a robust public process. The CEQA process takes time and is expensive.

- California does not generally have standard permit conditions, timelines, etc. for aquaculture projects due to varying regulatory authorities.

- Each project is individually considered which is time intensive and requires significant agency staff resources to evaluate site specific parameters (which vary throughout the state).

- No new CDFW aquaculture bottom leases have been approved in the past two decades. Over the past seven to ten years agencies have approved updates for several existing farms and some new projects. Most new projects have been in federal waters or in areas where Ports and Harbors have jurisdiction to grant leases. One demonstration project was recently permitted in state waters.

- Despite efforts by many agencies to harmonize their statutory authorities and required mitigations, conditions, and monitoring requirements for all types of marine aquaculture, these requirements are not consistently coordinated among agencies and, in some cases, permitting pathways or regulatory requirements are not well defined.
California Agency Knowledge is Increasing, but More is Needed

- While more recent permitting activity has increased agency knowledge around marine aquaculture, there is limited agency staff resources and institutional knowledge on this topic. General staff turnover and retirements will exacerbate this issue.
- Historically, there has been limited interagency communication and collaboration on aquaculture permit applications.
- Collaboration has been increasing since the Shellfish Initiative in the 2010s. A new interagency workgroup convened by the Ocean Protection Council (OPC) is encouraging coordination among California agencies, but does not include federal agencies.
- The forthcoming California Aquaculture Action Plan is creating momentum for change.
- Almost all stakeholders agreed California agencies need additional resources for aquaculture permitting activities, oversight/enforcement, and additional scientific research.
Starting Points for Marine Aquaculture Permitting Depend on the Project Location*

* Ports and Harbors may have granted authority from the legislature and can complete CEQA and other permitting activities and then issue permits to operators directly. Multiple state and federal permits are needed for each activity - this graphic only shows the starting point. Also, see Appendix A for a list of acronyms.

*CEA Consulting*
Permitting Agencies Vary Depending on Project Type and Location

All aquaculture projects go through essentially the same process and environmental review for authorization to operate. Climate projects (e.g., growing kelp for carbon sequestration or employing methane reducing cattle feed*) and restoration aquaculture have similar permitting requirements as aquaculture for food production or other commercial products. Conservation/restoration aquaculture activities that involve onshore captive breeding and returning species to the ocean have slightly different permitting requirements. All aquaculture projects undergo robust environmental review that can be time consuming and costly.

Permitting agencies vary depending on the type of project:

- State and federal agency permitting leads vary depending on the type of project and species and location (e.g., federally listed species will be primarily handled by the National Oceanic and Atmospheric Administration (NOAA)).
- Species need to be tested for pathogens prior to release in the wild to protect existing populations for projects repopulating species, while shellfish for human consumption has other required health tests.
- Scientific collection permits are required for collecting and/or monitoring species.
- The lead agency conducting environmental review could be one of several agencies:
  - California Fish and Game Commission (CFGC) takes the CEQA lead on commercial projects in non-granted lands in state waters.
  - State Lands Commission (SLC) will issue ground leases and conduct CEQA for non-commercial projects on non-granted lands in state waters.
  - Harbors and Ports (and other grantees) are the primary CEQA leads for granted lands in state waters.
  - In federal waters, U.S. Army Corps of Engineers (USACE) is the NEPA lead.
- State or federal listed species (endangered or threatened) have additional requirements.

* Agencies have little experience with seaweed projects, and permitting outcomes are currently uncertain. The recent successful permitting of the Ocean Rainforest project will help inform permitting for future projects.
Introduction

Agencies have Multiple Mandates and Permitting Outcomes are Not Consistent

Despite agency efforts, stakeholders indicate that permitting processes are not coordinated and mitigation and monitoring requirements for various types of aquaculture projects vary. The timeframe for receiving permits and authorizations varies from two to ten years.

This variation is likely driven by California agencies balancing a variety of goals and their own regulations and standards of review. A cohesive state policy on sustainable aquaculture could help resolve these differences. The following quotes demonstrate these variations:

“We envision a robust, sustainable commercial aquaculture industry that is informed by best available science; compatible with wild fisheries; guided by comprehensive planning and collaboration; causes minimal harm to the environment; provides local, safe and healthy food production; supports living wages and equitably grows the state’s economy; partners with California Native American Tribes; and protects public access.” — California Interagency Guiding Principles for Sustainable Marine Aquaculture in California, June 2021

“Our California Coast and waters are a beloved treasure that draws visitors around the world and are the linchpin for a $44 billion coastal economy. We cannot risk that for any industry – even one that claims to be revolutionary.” — CCC Response to CalMatters Article, 2/4/22

Kelp Harvesting

Photo credit: Ocean Rainforest
### Snapshot of Aquaculture Permitting Agencies and Responsibilities

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Agency:* Responsibility</th>
</tr>
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| Federal      | • NOAA: Provides technical support on variety of matters and manages permitting and oversight of Endangered Species Act, Marine Mammal Protection Act, and Essential Fish Habitat.  
• USFWS: Manages handling of federally listed endangered species where NOAA is not the lead.  
• USACE: Oversees Section 10 and 404 permitting, serves as NEPA lead for projects in federal waters, guides consultations with key agencies.  
• USCG: Evaluates possible navigation hazards and consults with state and federal agencies.  
• FDA: Ensures shellfish meet public health standards to avoid foodborne illness in federal waters. |
| State        | • CFGC: Approves leases for commercial aquaculture projects in state waters, determines if a lease is in the Public Interest, and partners with CDFW for the CEQA process.  
• CDFW: Includes the State Aquaculture Coordinator, conducts the CEQA analysis of commercial projects in state waters, approves scientific collection permits, and oversees health testing for shellfish and kelp restoration projects.  
• SLC: Approves ground leases for non-commercial aquaculture projects in state waters.  
• CCC: Ensures consistency with California Coastal Act, oversees Coastal Development Permits, and oversees Coastal Consistency Determinations.  
• CDPH: Ensures shellfish meet public health standards to avoid foodborne illness in state waters. |

*Please see slide 22 and Appendix A for a list of acronyms*
Aquaculture Permitting Process in California Waters

Introduction

Aquaculture Permitting Process in California Waters

**Project Design**
- Early Project Design
- Contact State Aquaculture Coordinator (SAC)
- Meet with SAC and Project Coordinating Teams

**Bottom Lease/CEQA Process**
- Submit Bottom Lease Application
- Public Interest Determination
- CEQA Process
- Lease Approval
  - Approval triggers additional permits.

**Federal, State, Local Permitting**
- Individual permits are separate and happen concurrently
  - Coastal Development Permit**
    - Section 10 and/or 404 Permit***
      - EFH/ESA Consultations
      - WQ and 401 Permits
      - Navigation Assessment
      - PATON Permit
      - NHPA Consultation
  - Growing Area Certification (Shellfish Only)
  - Aquaculture Registration
  - Use Permits

**Project Operations**
- Ongoing monitoring, permit fees, and import requirements

*Where Ports, Harbors, or other entities have legislatively-granted authority, that entity replaces CDFW and CFGC in this graphic and coordinate among agencies, complete CEQA and other permitting activities, and issue permits to operators directly. Since legislative authority is silent for non-commercial marine aquaculture projects in state waters, SLC replaces CDFW and CFGC on this slide. All projects are required to obtain the listed state and federal permits and CDFW would still be consulted on a variety of matters.

**The CDP permit needs to be issued prior to the ACDE Section 10 Permit.

***USACE permits may trigger NEPA or Joint CEQA/NEPA in some cases.

California Aquaculture Views and Recommendations for Moving Projects Forward
Aquaculture Permitting Process in Federal Waters

**Project Design**
- Early Project Design
- Contact USACE and NOAA RAC Coordinator
- Meet with Agencies and Consultants*

**NEPA Process/Consultations**
- Submit Section 10 and/or 404 Permit Application(s)
- NEPA Process → Grant Permit

**U.S. Army Corps of Engineers**
- Consistency Certification
  - NEPA will include:
    - EFH/ESA Consultations**
    - WO and 401 Permits
    - Navigation Risk Assessment
    - PATON Permit
    - NHPA Consultation
    - Seed Sourcing Review (APHIS)

**State, Federal, and Local Permits/Entitlements**
- Other Necessary Entitlements
  - Individual permits are separate and happen concurrently
  - NSSP NOAA Contract (Shellfish only)
  - NPDES Permit (Finfish only)
  - Aquaculture Registration
  - Use or other local permits, if needed

**Project Operations**
- Ongoing monitoring, permit fees, and import requirements**

*Sheltefish projects will need to contact NOAA Seafood Inspection Program, USFDA, and CDPH.

**The EFH/ESA consultations are associated with the Corps Section 10 permit and separate from NEPA.

**CDPH involved in landing products only.
Aquaculture Permitting Process Key

<table>
<thead>
<tr>
<th>Applicant</th>
<th>National Oceanic and Atmospheric Administration/National Marine Fisheries Service</th>
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<tbody>
<tr>
<td>CCC</td>
<td>State Historic Preservation Officer</td>
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<tr>
<td>CDFW</td>
<td>U.S. Army Corps of Engineers</td>
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<tr>
<td>CDPH</td>
<td>United States Coast Guard</td>
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<td>CFGC</td>
<td>U.S. Department of Agriculture</td>
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<td>CSHRC</td>
<td>U.S. Environmental Protection Agency</td>
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<td>Water Boards</td>
<td>California State Water Resources Control Board/California Regional Water Quality Control Boards</td>
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<tr>
<td>Local</td>
<td>U.S. Food and Drug Administration</td>
</tr>
<tr>
<td>NOAA</td>
<td>U.S. Fish &amp; Wildlife Service</td>
</tr>
<tr>
<td>Tribal Nations</td>
<td>Tribal nations recognized by state or federal governments</td>
</tr>
</tbody>
</table>
Introduction

Several Aquaculture Planning Activities are Underway in California*

OPC CA Aquaculture Action Plan: State Waters

OPC has engaged UC Santa Barbara’s (UCSB) National Center for Ecological Synthesis and Analysis (NCEAS) to develop an Action Plan for seaweed and shellfish in state waters and all types of land-based operations (finfish, seaweed, shellfish) that “creates a comprehensive, consistent and science-based framework and policy for marine aquaculture in California. …This Action Plan will establish a critical roadmap for aquaculture in California that protects ecosystem health while supporting a sustainable blue economy in the face of a changing climate.” (OPC staff report)

According to the OPC staff report, the action plan will:

• “provide guidance for minimizing environmental impacts to habitat, biodiversity, and wild fisheries;
• evaluate socioeconomic considerations; and
• include minimum project criteria for proposed aquaculture projects.”

OPC plans to release a draft Action Plan in the second half of 2023 for public review and comment; the report will be finalized in early 2024.

NOAA Aquaculture Opportunity Areas (AOA): Federal Waters

NOAA is using a combination of scientific analysis, spatial planning, and public engagement to identify areas in federal waters that could be suitable for commercial aquaculture. The goal is to minimize conflicts with other uses such as shipping, military, fishing, and recreation. NOAA will use the public comments on its Notice of Intent (NOI) to prepare a more detailed Programmatic Environmental Impact Statement (PEIS) for several areas off Southern California. The PEIS will provide more detailed analysis, further refine sites, and identify some of the necessary mitigations for future projects. “Once AOAs are identified and aquaculture operations are proposed within them, proposals will be subject to federal and state permitting and authorization processes, which may include project-specific requirements such as monitoring, reporting, and coastal zone consistency.” (NOAA AOA Factsheet)

Southern California Preliminary AOAs

*This slide is focused on current efforts. There have been multiple previous efforts around aquaculture both in the agencies and the legislature that are not covered in this report (e.g., California pursued a programmatic environmental impact report (EIR) for finfish and shellfish in state waters in 2003 and 2006. These efforts stalled and the Ocean Protection Council is now focusing on the Statewide Aquaculture Plan).
Overview of Stakeholder Views

While there are diverse views regarding aquaculture in California, there are areas of common ground among stakeholders.
CEA Stakeholder Interviews

CEA interviewed a variety of stakeholders representing farmers, regulators, tribal nations, scientists, environmental NGOs, and other groups to gather views on all types of aquaculture in California, identify barriers to permitting marine aquaculture, and discuss recommended solutions to create a more consistent and efficient permitting process.

This section summarizes key takeaways from CEA’s interviews and research. See Appendix C for observations by stakeholder group.
Overview of Stakeholder Views

High Interest in Aquaculture Projects from Multiple Stakeholders

**Scientists** are building upon a solid foundation of scientific research and understanding to pursue aquaculture projects and research to educate future farmers, inform all types of aquaculture projects, and answer important industry, conservation, and regulatory questions.

**Commercial practitioners** are interested in all types of aquaculture activities in state and federal waters. Much of their interest is in expanding shellfish production and kelp farming for both commercial markets and greenhouse gas reduction projects (methane reduction in cows and carbon sequestration). Some expressed interest in finfish aquaculture in federal waters (although practitioners realize offshore finfish will be more difficult to permit).

**Federal agencies are moving aquaculture forward** in federal waters off California. NOAA is charged to “preserve ocean sustainability and facilitate domestic aquaculture in the U.S. through the National Aquaculture Act of 1980, the NOAA Marine Aquaculture Policy, and Executive Order 13921 Promoting American Seafood Competitiveness and Economic Growth (May 7, 2020).” (NOAA website) Federal agencies are developing Aquaculture Opportunity Areas in federal waters off Southern California. NOAA, in collaboration with other state and federal agencies, are using a science-based process to identify areas that are suitable to locate sustainable marine aquaculture development. Federal agencies generally believe careful siting will help mitigate most impacts to ecosystems, species, and other ocean users.

**Tribal nations** want access to historic foods, economic development, and to co-manage resources. Some are actively educating themselves and pursuing projects; however, most do not have the resources or staff capacity to engage in stakeholder discussions about proposed projects or to undertake an aquaculture project of their own.

**Conservation and restoration** interests and needs are significant and varied in nearshore areas. Agencies and NGOs are working to restore shorelines, recover species, and reduce carbon. Since conservation or restoration aquaculture essentially has the same permitting pathway as commercial aquaculture, almost all of the permitting sticking points slow these projects down, as well.

Photo: Jonathan MacKay

Juvenile Abalone in grow tank
Environmental Organizations and State Agency Interests Have Mixed Views on Aquaculture

Views range from promoting more aquaculture to taking a more precautionary approach to permitting aquaculture activities.

Environmental NGO views track the organization’s ocean program goals. Some organizations, primarily those that focus on sustainability and climate issues more broadly, see well-designed, sustainable marine aquaculture as an integral part of the blue economy, sustainable food systems, and an important tool in the climate change toolbox. Other groups, primarily those focused on ocean and species conservation, prefer to limit activities to conservation and restoration as they do not want to see further industrialization of the California coast.

State agencies are generally cautious in their permitting approach as they must balance multiple coastal uses and authorities. Agencies have constrained aquaculture permitting staff resources and have limited and, in some cases, decreasing institutional knowledge on the topic. Staff could benefit from additional opportunities to increase knowledge about marine aquaculture (e.g., access to scientific literature, additional training, etc.) which would help them with decision-making and possibly avoid falling back on the precautionary approach when permitting projects.

As with other stakeholders, agencies and environmental groups acknowledged they have limited capacity to permit aquaculture or participate in the public process. A few felt they can manage their current aquaculture workload, however, the majority indicated they do not have sufficient time or resources to manage their existing responsibilities in an informed and efficient way. These same agencies and environmental groups expressed concern about finding time and staff to build or replace retired institutional knowledge, process and incorporate current or new science, stay up-to-date on potential new technologies, establish best management practices, and/or the develop different applications for restoration, conservation, or climate projects. All agreed if additional new projects are proposed in state or federal waters, resources need to scale appropriately.
Overview of Stakeholder Views

Existing Aquaculture Permitting is Complex, Time Consuming, Costly, and Unpredictable

Permitting for all types of projects, such as restoration, conservation, research, climate and food production, and other commercial efforts, is complex and time consuming (see Sections 5 and 6 for permitting overview). Farmers and agencies estimate that costs range from several thousands of dollars to over 1 million dollars to obtain the needed permits and authorizations for a project.

Small operators, scientists, and environmental NGOs struggle to successfully navigate the system. The existing system limits opportunities for small commercial operators and those pursuing permits for conservation or restoration aquaculture that cannot justify or produce investment of this magnitude. Multiple interviewees noted that, when faced with daunting permitting obstacles, they were forced to return funds and/or cancel projects due to the cost or the lengthy timeline for permits. Unintended consequences of the current process are stalled or failed attempts for needed conservation and restoration activities, stifled innovation and opportunities for younger entrepreneurs, and exacerbation of equity and inclusion issues.

While more recent permitting activity has increased agency knowledge around marine aquaculture, agencies have limited staff and resources for permitting, oversight, and enforcement activities. Despite improved agency collaboration, there is also a lack of consistency in how permit applications are processed. Therefore, permit outcomes (mitigations and monitoring requirements) are not always standardized and may vary. These inconsistencies are within individual agencies, among different state agencies (likely due to varying authorities among agencies), and between state and federal agencies. Additionally, agencies are losing or have lost institutional knowledge that will further complicate matters as replacement staff “reinvent the wheel.”

Aquaculture activities can impact the environment, navigation, recreation, public health, and other aquatic uses. Agencies and industry expressed a strong interest in a more consistent and coordinated permitting process that results in well-run projects with appropriate oversight. Interviewees agreed that this will be integral to building public trust in sustainable aquaculture activities.

Lack of Definitions and Coordination Creates Delays

When a research project focused on eelgrass applied for permits, a state agency objected to the project’s proposal to plant temporary tongue depressors with 3-inch buoys to mark habitat and the research site and requested the applicant to apply for a permit. The applicant spent over six months going back and forth between the local jurisdiction and the state agency to sort out the issue and finally gain approvals to mark the research site. Creating best practices and/or standard permit conditions that can be used across agencies can avoid these types of delays.
Stakeholder Permitting Concerns & Recommendations

The following slides summarize concerns about the marine aquaculture permitting process and possible recommendations that were raised during interviews as well as during CEA’s desktop research. The slides in this section follow the general permitting process discussed in the introduction (project design, bottom lease, CEQA process, other permits- see Sections 5 and 6 for an overview of the permitting process).
### Stakeholder Permitting Concerns and Recommendations: Project Design Phase

<table>
<thead>
<tr>
<th>Stakeholder Concerns</th>
<th>Possible Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agencies have limited time and resources to help applicants scope aquaculture projects.</td>
<td>Increase agency resources (increase staffing and overall funding). More agency staff is needed to support the Aquaculture Coordinator with subject matter expertise to guide an applicant through all stages of the permitting process. CDFW and/or the CFGC also need CEQA trained staff.</td>
</tr>
<tr>
<td>Small applicants may not have the resources to consult with multiple agencies and local/tribal/private stakeholders. Detailed project knowledge may not be possible at the start.</td>
<td>While permitting guidance is available, applicants need better tools. Suggestions included a web-based instructional portal with:</td>
</tr>
<tr>
<td>• Some projects are seeking permits that will use or test new methods or gear to improve and keep up with science-based best practices and may not have sufficient data to satisfy regulators.</td>
<td></td>
</tr>
<tr>
<td>• New applicants may not have the depth of knowledge and understanding to know everything up front.</td>
<td></td>
</tr>
<tr>
<td>Operators have trouble finding permit conditions from previously approved projects that will help them design future projects. Since these are not easily found, farmers end up asking lawyers or consultants to prepare this information at significant cost.</td>
<td>• Instructional videos and Q&amp;As</td>
</tr>
<tr>
<td></td>
<td>• A statewide aquaculture mapping and planning tool to identify areas suitable for aquaculture expansion. Marine spatial planning in state waters that is publicly available will facilitate siting and increase transparency.</td>
</tr>
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<td></td>
<td>• A list of best management practices (collated by project type) that have been previously approved by agencies.</td>
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<td></td>
<td>• Guidance documents, websites, and videos for specific types of aquaculture, such as seaweed, eel grass, Olympia oysters, etc. (Examples include seaweed information from NOAA, and Sea Grant Alaska Site Assessment Toolkit to improve kelp farm site selection.)</td>
</tr>
<tr>
<td></td>
<td>• Provide examples and resources to help applicants successfully obtain permits and authorizations. Include examples of past conditions, details, etc.</td>
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### Stakeholder Permitting Concerns and Recommendations: Project Design Phase (continued)

<table>
<thead>
<tr>
<th>Stakeholder Concerns</th>
<th>Possible Solutions</th>
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</thead>
<tbody>
<tr>
<td>Agencies ask for the same or similar information in different formats.</td>
<td>All agencies should coordinate and agree up front about the data that will be needed from the applicant to support project applications.</td>
</tr>
<tr>
<td>Agency coordination and feedback at the start can save time and money.</td>
<td>Strong desire to have fewer application forms. The goal should be to have one form for all state agencies, and one form for all federal agencies.</td>
</tr>
<tr>
<td>Many non-CEQA permits are straightforward but could slow permitting if not initiated early in the process. Multiple state and federal permits require careful sequencing. For example, the USCG Navigation Risk Analysis or the CDPH shellfish analysis could take months if more detailed analysis is required.</td>
<td>Early consultations are essential for all projects.</td>
</tr>
</tbody>
</table>

*Abalone Farm, Cayucos, CA*  
*Photo: Melissa Habegger*
Stakeholder Permitting Concerns and Recommendations: Water Bottom Lease Public Interest Determination

**Background:** The California Fish and Game Commission (CFGC) is currently in the process of developing criteria to determine if a marine aquaculture bottom lease application is in the public interest.

Since the CFGC process for making public interest determinations is under development, stakeholders identified the following concerns:

- While it will be helpful for CFGC (and CDFW) to establish definitions and criteria for the public interest determination, there is concern that the process will add costs and delays to an already lengthy, complex, and expensive permitting process and duplicate some of the analyses required during permitting.

- This additional step will open proposed projects up to another public process that could solicit criticism from those opposed to aquaculture.

- There is uncertainty how this process will interact with CEQA, which is also required before the issuance of a bottom lease.

- There is concern that when CDFW implements CFGC’s criteria, CDFW’s decision will be subject to litigation.

Recommended solutions were not discussed during stakeholder interviews as this process was not underway for much of the report development timeframe.
Stakeholder Permitting Concerns and Recommendations: Water Bottom Lease CEQA Process

**Background:** If CFGC finds an application is in the public interest, they initiate the California Environmental Quality Act (CEQA) process, with CFCG serving as the “Lead Agency” and CDFW serving as the CEQA coordinator (CDFW effectively executes the CEQA process). CDFW did not process water bottom leases for approximately 20 years and only recently began processing them again.

<table>
<thead>
<tr>
<th>Stakeholder Concerns</th>
<th>Possible Solutions</th>
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<tbody>
<tr>
<td>Concerns were raised that CDFW lacks sufficient staff or resources to process leases and serve as lead CEQA agency in the future.</td>
<td>Legislation could provide additional staff resources to CDFW and give CFGC the ability to charge fees to applicants to pay for CEQA expenses (similar to other state agencies).</td>
</tr>
<tr>
<td>Unlike other state agencies, state law prohibits CFGC from collecting fees from permit applicants to cover the CEQA expenses.</td>
<td>Incorporate evaluations from downstream permitting (like the 401 permit, the ESA/PRD, and historic/cultural resources considerations) into the CEQA process.</td>
</tr>
<tr>
<td>CEQA documents that do not analyze impacts addressed by downstream permits can be challenged for “deferred analysis.”</td>
<td>Allow the applicant to select approved best management practices, which have already gone through environmental review, to simplify and reduce costs and risks associated with the CEQA process.</td>
</tr>
<tr>
<td>CEQA is a lengthy and often expensive process to identify a project’s significant environmental impacts and then mitigate those impacts.</td>
<td>Undertake a programmatic approach (e.g., a PEIR for a region, area, species, etc.) to make a project less prone to legal challenges.</td>
</tr>
<tr>
<td>CEQA costs are prohibitive for small applicants.</td>
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<tr>
<td>CEQA introduces legal risks that can jeopardize the project.</td>
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<tr>
<td>The California Aquaculture Portal was only designed for the pre-application phase.</td>
<td>Agencies should extend the involvement of the state Aquaculture Coordinator (CDFW) and the Aquaculture Portal through the point of obtaining a water bottom lease.</td>
</tr>
</tbody>
</table>
Stakeholder Permitting Concerns and Recommendations: USACE Permit Process and NOAA

**Background:** The United States Army Corps of Engineers (USACE) has a role in both state and federal waters. For aquaculture permitting in state waters, few interviewees expressed concerns with the USACE permit process. Given that there has only been one aquaculture project permitted in federal waters recently, interviewees did not comment on the USACE/NEPA process. NOAA* is generally considered good to work with on marine aquaculture permitting. Stakeholders appreciated NOAA’s strong technical expertise and willingness to try new and/or innovative approaches to permitting.

**Recommendations for USACE and NOAA**

- Spatial mapping tools and other permitting guidance documents created for other states, such as Alaska, were very useful and could be extended to California.
- NOAA’s experience with spatial mapping could be leveraged in state waters.
- Improved coordination between all federal agencies, and between state and federal agencies, is recommended.
- In the case of a couple restoration projects, interviewees noted that NOAA was complicated to work with (‘moving the target’) and defaulted to precautionary approaches. Recommended standard permit conditions to avoid complications.

*Note: NOAA is comprised of many different line offices, each with different goals, objectives, and priorities (e.g., promoting sustainable seafood and conserving habitat).*
## Stakeholder Permitting Concerns and Recommendations: California Coastal Commission (CCC)

<table>
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<tr>
<th>Stakeholder Concerns</th>
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<tr>
<td>It is resource intensive to find and challenging to understand what was accepted by the CCC as precedent in previous applications.</td>
<td>Package this information in a more digestible format and make it readily available for all applicants and other stakeholders. Educate stakeholders on how to use CCC online permitting database.</td>
</tr>
<tr>
<td>Each project is evaluated individually on a case-by-case basis. This is not efficient and can lead to inconsistent results.</td>
<td>Applicants would like more consistency and clarity regarding approvals for specific mitigation and applicant monitoring requirements. Interviewees, representing all types of aquaculture production, agreed that a programmatic approach (e.g., agency-approved BMPs) could save time and resources.</td>
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<tr>
<td>Applicants would like more certainty and assurance that if a process or mitigation was approved in the past, then it would be approved going forward.</td>
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<td>Skepticism that the CCC would approve larger aquaculture projects in the future.</td>
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<tr>
<td>Unclear what science and data will be needed for applications (at the CCC and other agencies)</td>
<td>The CCC, and all the other state agencies, should coordinate and agree on what they will accept as adequate scientific information to make informed decisions and standardize the information they need from the applicants.</td>
</tr>
<tr>
<td>CCC staff have limited knowledge and resources to process marine aquaculture permits and therefore tend to default to a precautionary approach. This approach can require exhaustive studies or substantial changes to the project.</td>
<td>Increase agency resources (staff, training, access to more scientific resources, and overall funding) to allow agency staff the time and resources to engage in aquaculture science and develop BMPs or standard permit conditions to protect coastal resources.</td>
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### Stakeholder Permitting Concerns and Recommendations: Applicant Monitoring and Agency Oversight and Enforcement

<table>
<thead>
<tr>
<th>Stakeholder Concerns</th>
<th>Possible Solutions</th>
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<tbody>
<tr>
<td>State agencies do not have sufficient resources to conduct site visits and enforce permit conditions.</td>
<td>Augment agency resources.</td>
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<tr>
<td>State and federal agencies do not have clear roles for enforcement in federal waters.</td>
<td>Clarify roles and provide sufficient resources.</td>
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<tr>
<td>If the number of aquaculture permits expands, more resources would be needed for patrols and new/augmented labs in order to ensure proper and efficient enforcement. Delays in lab testing could lead to a decrease in the number of organisms brought to market.</td>
<td>Anticipate future agency oversight, enforcement, and laboratory needs and augment funds accordingly.</td>
</tr>
<tr>
<td>Agencies have overly burdensome testing and reporting requirements in their permits.</td>
<td>Applicant monitoring and reporting requirements could be reduced if earlier reporting and testing demonstrated no significant impact from operations.</td>
</tr>
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</table>
Stakeholder Permitting Concerns and Recommendations: Conservation and Restoration* Projects

**Background:** Some conservation and restoration projects have different permitting pathways and do not require a bottom lease to grow animals, algae, or plants in state or federal waters. These pathways are also complex, vary by type of project, and face permitting hurdles.

<table>
<thead>
<tr>
<th>Stakeholder Concerns</th>
<th>Possible Solutions</th>
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<tbody>
<tr>
<td>Agency staff are not always clear about the differences between marine aquaculture, living shoreline, and other marine conservation or restoration projects.</td>
<td>Definitions are needed for artificial reefs, living shoreline/coastal restoration projects, and marine aquaculture conservation and restoration projects. These definitions and the most recent science need to be communicated and incorporated across agencies. Guidance documents may be helpful to institutionalize knowledge.</td>
</tr>
<tr>
<td>Conservation aquaculture projects are frequently carried out under CDFW scientific collection permits. This is appropriate for research but may be hindering conservation and restoration projects or creating inefficiencies.</td>
<td>Create accelerated pathways (most likely via programmatic approaches) to authorize conservation and restoration activities.</td>
</tr>
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</table>

* There are a broad range of marine conservation and restoration activities in California. These range from aquaculture projects that raise plants or animal on land or onshore, to coastal restoration activities that provide substrate for species recovery or create living shorelines. The projects that do not follow the bottom lease permitting path described in this report undergo comprehensive permitting that depend on the specifics of each project. CEA received similar feedback for permitting of all types of conservation and restoration projects as presented in this slide and the previous slide, but agencies and other stakeholders noted many of these projects are not aquaculture and should not be confused with marine aquaculture projects or required to undergo marine aquaculture permitting.
Stakeholder Permitting Concerns and Recommendations: Conservation and Restoration Projects (continued)

<table>
<thead>
<tr>
<th>Stakeholder Concerns</th>
<th>Possible Solutions</th>
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</table>
| Permitting for conservation and restoration projects can be slow and expensive which can lead, in some cases, to project cancellation and returning grant funds. | Like the bottom lease permitting process, there are parallel opportunities to build in efficiencies to increase the number and size of conservation and restoration projects. Examples include (this is not an exhaustive list):  
- Improve coordination among state agencies and between state and federal agencies.  
- Standardize approaches and clarify agency roles for restoration and conservation projects to expedite permitting.  
- Harmonize state and federal agencies approaches statewide (e.g., revise USACE living shoreline permit for west coast conditions) or updating state programs (e.g., updating CDFW’s artificial reef program).  
- Prioritize research projects and issue associated scientific collection permits (required for monitoring conservation and restoration projects). This will ensure the strong scientific foundation for marine aquaculture and other conservation and restoration projects continues to grow. |
| Agencies lack consensus on how to approach many marine restoration and conservation activities. | Convene roundtable discussions among policymakers, regulators, practitioners, and other stakeholders to develop a common understanding on how to approach conservation and restoration for specific species or regions. Consider programmatic approaches. |
| Agencies are understaffed and under resourced.                                       | Increase agency resources for staffing. All of the recommendations listed above will require additional staff and resources. |
Stakeholder Permitting Concerns and Recommendations: Cross Cutting Observations and Recommendations

Despite a variety of opinions on the role conservation, restoration, climate, research, and food production and other commercial aquaculture projects could play in California, multiple stakeholder views aligned across several cross-cutting areas.

**Scope of Aquaculture in California**
- Most felt California should develop a clear vision for marine aquaculture and take steps to implement that vision.
- Several noted small/regional shellfish and seaweed projects may garner more support than finfish and larger-scale projects.
- Most agreed that conservation, climate, and/or restoration projects should move forward on an expedited basis.
- Many agreed that the complex permitting process for commercial aquaculture should be improved so California can realize the important benefits marine aquaculture can provide.

**Consider a Programmatic Approach**
- Most all applicants agreed a programmatic approach (standard permit conditions, BMPs, etc.) could be protective of the environment and provide transparency and clarity to the permitting process.

**Agencies Can Improve and Will Need More Time and Staff to Develop Solutions**
- Agencies need to harmonize permitting activities and be more consistent and clearer regarding permitting, agency oversight, applicant monitoring requirements, and data needs. This will create more transparency.
- Interagency collaboration within California and between state and federal agencies needs improvement.
- Effective agency oversight and enforcement, as appropriate based on the best available science, will be critical to garner trust and social license for marine aquaculture in California.
- Agencies need to agree on consistent definitions for different types of aquaculture to build trust and move the process forward in a consistent and efficient manner.
- If sufficiently staffed, agencies could act as problem solvers.
Stakeholder Permitting Concerns and Recommendations: Cross Cutting Observations and Recommendations (continued)

More Resources are Needed for Aquaculture

• Agencies need additional resources and staff to implement effectively on all levels: permitting, oversight, and enforcement activities.

• Stakeholders will need to partner to bring more resources to this sector.
  • Funding sources could include state and federal government funds or other NGO/philanthropic stakeholders who could support permitting, oversight, and/or enforcement improvements.

• Fees on aquaculture operations (especially smaller projects) cannot support the needed regulatory and permitting reforms.

Need for Creative Options

• Completing baseline environmental studies upfront would dramatically lower entry costs for small operators.

• Create a process for small, short-term pilot permits/authorizations that allow the precautionary principal to be applied. Such projects will not only help the regulators establish any impacts, but also allow a farmer to experiment without investing significant resources and time.
Stakeholder Permitting Concerns and Recommendations: Good Examples for California to Follow

Other states have adopted plans, strategies, initiatives, and regulatory changes which California could customize and implement to foster improved coordination and advance sustainable aquaculture. A few examples include:

**Florida:** The Florida Aquaculture Policy Act (2017) declared that aquaculture is agriculture and directed the state’s Department of Agriculture and Consumer Services to regulate activities. The Act also called for a State Aquaculture Plan (2021) to coordinate and prioritize state aquaculture efforts, conserve and enhance aquatic resources, and provide mechanisms for increasing aquaculture production which may lead to the creation of new industries, job opportunities, income for aquaculturists, and other benefits to the state. The Plan also guides the research and development of the aquaculture industry and directs funds for aquaculture research and development.

The Department of Agriculture’s website provides helpful permitting tools including Aquaculture Best Management Practices to ensure that aquaculture facilities do not negatively impact the environment.

**Massachusetts:** In March 2021, the Massachusetts Shellfish Initiative (MSI), which was modeled after the NOAA Fisheries National Shellfish Initiative (NSI), approved its MSI 2021-2025 Strategic Plan which identified six objective categories under which goals, strategies and recommendations were developed. The six categories focused on improved communication and coordination, improved tools, additional resources, supporting cultural and historical uses of shellfish, and ensuring ecologically sound management. In addition, recent legislation will create a new 15-member Shellfish Advisory Panel.

**Alaska:** Alaska strongly promotes sustainable aquaculture growth and development, and recent activities of note, supported by the Governor’s task force, include the Alaska Mariculture Development Plan (2018), the Alaska Mariculture Initiative, the Alaska Aquaculture Permitting Portal and the Alaska Aquaculture Permitting Guide (2021). The Permitting guide, which was developed in coordination with NOAA, includes guidance for siting a farm (including 4 separate online mapping tools), step-by-step application process instructions with permitting flow diagrams, and other resources for growers.
Regulatory Landscape: California Waters

There is a complex regulatory landscape for any type of aquaculture project in California. While seemingly straightforward on paper, permitting pathways do not yield consistent outcomes.
State Policies and Regulations Encourage Aquaculture

While the California aquaculture permitting process is complex, it is important to acknowledge that State policies support and encourage aquaculture.

State and federal laws explicitly allow and encourage aquaculture.

- California 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 priority, except over other coastal dependent developments or uses.” (Section 30222.5)

Other state policies which encourage aquaculture include:

- Aquaculture Development Act (PRC Sec. 825 et seq.) provides state policy direction encouraging, among other things, the practice of aquaculture.
- Fish and Game Code Section 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.
  - In providing oversight of marine aquaculture development, the state is also directed to provide regulatory and administrative efficiency and effectiveness (Assembly Joint Resolution 43 (2014 Chesbro); FGC Sections 15100, 15702; and Government Code 65920 et seq.).
  - In 2014, the Legislature resolved unanimously its support for access to additional acreage for shellfish farming and restoration and an improved permitting process that is efficient and economical (Assembly Joint Resolution 43, Chesbro 2014).
- The June 2021 multi-agency Guiding Principles for Sustainable Marine Aquaculture in California envisions a robust, sustainable commercial aquaculture industry.

Source: Guiding Principles for Sustainable Marine Aquaculture in California
Permitting Pathways for Aquaculture in California State Waters

This section summarizes the complex process to permit aquaculture in California waters as depicted on slides 45 and 46 and provides insights gained through interviews with selected stakeholders.

- Marine aquaculture permitting in state waters requires an applicant to interact with multiple local, state, and federal regulators that must approve the proposed project, as well as interested parties such as other landowners or tribal nations.
- Slides 45 and 46 provide a list of these agencies and summarizes the permitting pathways.
- Where Ports, Harbors, or other entities have been granted authority to grant ground leases, they replace CDFW and CFGC in these slides and figures.
- Because every project and applicant is unique, it is difficult to estimate the time and cost to obtain a state aquaculture permit.
- Time to obtain permits and authorizations can range from one to many years, while costs range from several thousands of dollars to over one million dollars.
- These costs include scientific studies, application fees, CEQA environmental reviews, consultant, and attorney fees.
- All permitting will occur in a public process and interested parties have multiple opportunities to share their opinions.
- Interested parties may also seek legal remedies.
- Projects that include onshore captive breading and release have a slightly different permitting path based on the specific project parameters.
Aquaculture Permitting Process in California Waters

**Regulatory Landscape: California Waters**

*Project Design*
- **Early Project Design**
  - Contact State Aquaculture Coordinator (SAC)
- Meet with SAC and Project Coordinating Teams

*Bottom Lease/CEQA Process*
- Submit Bottom Lease Application
- Public Interest Determination
- CEQA Process
- Lease Approval
- Approval triggers additional permits

*Federal, State, Local Permitting*
- Individual permits are separate and happen concurrently

*Project Operations*
- Ongoing monitoring, permit fees, and import requirements

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*Where Ports, Harbors, or other entities have legislatively granted authority, that entity replaces CDFW and CFGC in this graphic and coordinate among agencies, complete CEQA and other permitting activities, and issue permits to operators directly. Since legislative authority is silent for non-commercial marine aquaculture projects in state waters, SLC replaces CDFW and CFGC on this slide. All projects are required to obtain the listed state and federal permits and CDFW would still be consulted on a variety of matters.*

**The CDP permit needs to be issued prior to the ACDE Section 10 Permit.**

***USACE permits may trigger NEPA or Joint CEQA/NEPA in some cases.***
**Aquaculture Permitting Process Key**

<table>
<thead>
<tr>
<th>Color</th>
<th>Agency/Department</th>
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<tbody>
<tr>
<td>Applicant/Farmer</td>
<td>National Oceanic and Atmospheric Administration/ National Marine Fisheries Service</td>
</tr>
<tr>
<td>California Coastal Commission</td>
<td>State Historic Preservation Officer</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>U.S. Army Corps of Engineers</td>
</tr>
<tr>
<td>California Department of Public Health</td>
<td>United States Coast Guard</td>
</tr>
<tr>
<td>California Fish and Game Commission</td>
<td>U.S. Department of Agriculture</td>
</tr>
<tr>
<td>California State Historical Resources Commission</td>
<td>U.S. Environmental Protection Agency</td>
</tr>
<tr>
<td>California State Water Resources Control Board/ California Regional Water Quality Control Boards</td>
<td>U.S. Food and Drug Administration</td>
</tr>
<tr>
<td>Cities/Counties</td>
<td>U.S. Fish &amp; Wildlife Service</td>
</tr>
<tr>
<td>National Oceanic and Atmospheric Administration</td>
<td>Tribal nations recognized by state or federal governments</td>
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</table>
**Project Design Phase - Early Design and Consultation**

*Early project design and consultations can minimize the time and cost to navigate the regulatory process*

- An applicant is well served by identifying key elements of its project in as much detail as possible as early as possible.
- Key elements include details such as a spatial siting analysis, a marine engineering analysis, a proposed farm construction plan (with ancillary structures or infrastructure), a proposed farm operations and maintenance plan (with best management practices and monitoring activity), a contingency plan, a Navigation Hazard Risk Assessment, biological resource information, source of seeds, biotoxin testing, access and onshore support, relevant qualification and experience, and operational flexibility and adaptation.
- Important resources to assist applicants include the California Aquaculture Portal and the Permit Guide to Aquaculture in California.
- A key early step is to contact the State Aquaculture Coordinator (SAC) at the California Department of Fish and Wildlife (CDFW).
- After consultation with the applicant, the SAC may set up initial consultations with a Project Coordinating Team (PCT) consisting of other state, federal, and/or local agencies who will provide early feedback and help the applicant refine its project before moving forward.
- Engagement can occur using the Aquaculture Permit Counter tool, which is maintained by the SAC.
- This is also a good time for initial consultations with tribal nations, local municipalities, and local stakeholders.
- The next step is to apply for a water bottom lease.
Apply for and Obtain a Water Bottom Lease (includes CEQA)

 Obtaining a water bottom lease is a multi-step process led by the California Fish & Game Commission (CFGC) and California Department of Fish and Wildlife (CDFW) with input from multiple agencies during the CEQA process. This section of the report focuses on obtaining a commercial lease from non-granted state tidelands.

- The first step is to apply to the appropriate tidelands authority.*

- For commercial projects in non-granted state tidelands, submit a State Water Bottom Lease Application to the CFGC**, who in turn refers the application to CDFW. CDFW leads the environmental review in the California Environmental Quality Act (CEQA) process.

- Submittal of the lease application initiates the CFGC and CDFW’s Public Interest Determination process.

- The Commission must determine that a lease is in the public interest prior to issuing an aquaculture lease. The Commission and CDFW are currently developing criteria for this determination.

- If the Commission determines through its public process that the aquaculture project is in the public interest, they will initiate an environmental review under the California Environmental Quality Act (CEQA), which is described in more detail on the following slide.

- CDFW will consult with the State Lands Commission to 1) determine the State’s ownership, and 2) ensure the proposed project does not interfere with other Public Trust resources and is in the best interests of the State.

- At the conclusion of the CEQA process and the actions listed above, CFGC will hold a public hearing and ultimately approve the State Water Bottom Lease.

* Slide 16 illustrate how to determine the appropriate authority.
** The lease application can be found here on pages 87-90.
The CEQA Process

- CFGC initiates the CEQA process and serves as the “Lead Agency,” while CDFW serves as the CEQA coordinator. CDFW effectively executes the CEQA process. As noted above, ports and harbors or the State Lands Commission could be CEQA leads depending on the type and location of the project.

- CEQA is a lengthy and often expensive process which seeks to identify and mitigate a project’s significant environmental impacts.
  - California does not yet have standard permit conditions or best management practices to expedite environmental review.
  - Applicants often use expert consultants to lead them through the CEQA process. An illustration of the CEQA process can be found [here](#).
  - CDFW often receives input from other state and federal agencies (i.e., from the Water Boards for water quality, NOAA/NMFS and USFWS for endangered species and essential fish habitat, the Coastal Commission for issues related to consistency with the California Coastal Act and the Coastal Development Permit, CASHPO for issues related to tribal impacts, USACE for issues related to its permit(s), and from the US Coast Guard related to navigational impacts).

- The AB 52 Tribal Consultation process requires applicants to engage early in the planning process with California Native American tribes and provide needed information to the lead agencies to preserve tribal cultural resources.

- CEQA is a public process, so impacted stakeholders, such as fishing and boating interests, may comment on and potentially challenge the project. Notice is issued by the State Clearinghouse for public and multi-agency review.

- At the conclusion of the CEQA environmental review, CFGC will issue its Final Environmental Impact Report or Mitigated Negative Declaration, and make its final decision on the project.

Source: Ocean Rainforest

Kelp Farm in Southern California
California Coastal Commission – Coastal Development Permit

- The California Coastal Commission (CCC) is charged with regulating all development in the coastal zone through the issuance of a Coastal Development Permit (CDP).
  - The California Coastal Act defines development broadly; any activity involving a structure in the water or change of water use must receive a CDP.
- Applicants must submit a coastal development permit application detailing the proposed activity. Applicants are encouraged to carefully review and follow the CCC’s CDP Application Guidance - Aquaculture and Marine Restoration.
- Once an application is submitted, CCC staff has 30 days to determine if the application is “complete”. If the application is incomplete, CCC staff and the applicant will work together until the organization determines the application is complete. Upon completion, staff will file the application.
- Over the next 180 days, CCC staff prepare its report and analysis of the project and make recommendations to the Commission. Recommendations often include mitigation and ongoing applicant monitoring/reporting requirements.
- The Commission renders its decision at a public hearing.
- It is unclear how long permitting would take for new marine aquaculture projects, with recent permitting times ranging from a few months to over a year.
US Army Corps of Engineers (USACE) Permit Process

- Applicants must complete and submit an application to the United States Army Corps of Engineers (USACE) for a Section 10 Permit and/or a Section 404 Permit.
- **USACE Section 10 Permits** are required to protect navigation for commerce.
- **USACE Section 404 Permits** are required for discharges of dredged or fill material into waters of the US.
  - Any project that disturbs or adds material to the ocean floor will require a 404 permit or verification.
- Types of Section 10 and 404 permits include:
  - **General Permits (GP):** GPs are intended to streamline the authorization process for defined categories of activities that only result in minimal adverse environmental effects. GPs include:
    - Nationwide Permit (NWP) 48* – Commercial Shellfish Mariculture Activities
    - NWP 55 – Seaweed Mariculture Activities
    - NWP 56 – Finfish Mariculture Activities
  - **Individual Permits (IPs):** IPs are customized for specific activities that do not qualify for a GP.
  - **Letters of Permission (LOP):** An LOP is a type of individual permit specific only to Section 10 and is issued through an abbreviated processing procedure. This process includes coordination with other Federal and state agencies and a public interest evaluation but does not require the publishing of an individual public notice.

* NWP 48 is currently subject to litigation in Washington.
Other Consultations/Permits during the USACE Permit Process

- **USACE** will consult with **NOAA Fisheries** (and/or **USFWS** if applicable) before taking any action that may:
  1. affect an endangered or threatened species under the Endangered Species Act (ESA),
  2. affect essential fish habitat (ESH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and
  3. lead to an unlawful taking of a marine mammal under the Marine Mammal Protection Act (MMPA).

- **USACE** will consult with the **US Coast Guard (USCG)** regarding:
  - Private Aids to Navigation (PATON) consultation: USCG has authority to control private aids to navigation (such as buoys) in waters of the US.
  - Navigation Assessment: although an assessment is not formally required, precedent has been established for aquaculture projects in state waters for the USACE to ask the USCG to assess the impact of an aquaculture project on navigation.

- **USACE** will consult with **State Water Boards** regarding:
  - National Pollutant Discharge Elimination System (NPDES) permit: aquaculture projects which discharge pollutants are required to obtain a NPDES permit under Section 402 of the Clean Water Act. Shellfish and microalgae operations that add no substances or materials to the waters may not be required to obtain an NPDES permit.

- **USACE** will consult with **Tribal Governments**.
  - Section 106 of the National Historic Preservation Act mandates that tribal governments be consulted in order to establish if the proposed project is on or near tribal lands of importance.
  - The Office of Aquaculture and the Department of Fish and Wildlife Tribal Liaison assist in coordinating these consultations. Read more about this topic on CDFW's website.

* These consultations are separate from the CEQA process.
Additional State and Local Permits and Authorizations

California Department of Fish and Wildlife (CDFW) requirements

- **State Aquaculture Registration Program**: Once a lease has been issued, all aquaculture projects must be annually registered with the state registration program.
- **Importation Permit**: State law requires an Importation Permit to import most live aquatic plants and animals for cultivation in state waters.
- **Wild Broodstock Collection Permit**: This permit is required for initial aquaculture stocks which originate from the wild. Additional (separate) approvals from the Fish and Game Commission are required for Sturgeon or Striped Bass collections.

Local Permits

- Depending on the location, aquaculture applicants may need a variety of local permits associated with onshore or nearshore operations such as water access, fire prevention, and a business license.
- In addition, applicants may have to consult with ports, harbors, and native tribes.

GO-Biz

- The permitting tool at GO-Biz may also provide information on other permits.

California Department of Public Health (CDPH)

- CDPH regulates the growing, harvesting, processing, and marketing of bivalve shellfish (including oysters, mussels, clams, and scallops) intended for sale for human consumption. CDPH participates in the National Sanitation Shellfish Program (NSSP) and the Interstate Shellfish Sanitation Conference for the sanitary control of shellfish. Within CDPH, the shellfish sanitation program is divided into two main components: Preharvest (administered under Environmental Management Branch) and Postharvest (administered under Food and Drug Branch). See this [step-by-step process](#).

- Preharvest requirements:
  - **Classification and Certification of Growing Area** (bivalve shellfish only): Utilize a Sanitary Survey to assess the cleanliness of the growing area from impacts such as wastewater treatment, shipping, ports, oil rigs, etc. A full survey can take over a year in certain circumstances.

- Postharvest requirements:
  - [Shellfish Handling and Marketing Certificate](#)
  - [Shellfish Dealer Certification](#)

Source: Permit Guide to Aquaculture in California
Project Operations and Agency Oversight

California Department of Fish and Wildlife

- Ongoing patrols include oversight of aquaculture operations and coordination with other state agencies to enforce requirements.
- CDFW field staff may also assist CDPH with enforcement activities.

CA Department of Public Health

- Ongoing oversight and inspections of aquaculture facilities – some CDPH personnel are peace officers while some are scientists.
- CDPH determines compliance with the NSSP and Shellfish Handling and Marketing certificate.

California Coastal Commission

- Ongoing oversight of operations to ensure compliance with permit conditions

NOAA/NMFS

- Ongoing oversight to ensure no violations of endangered species.

Diver Monitoring Kelp

Photo: CA Sea Grant
Regulatory Landscape: Federal Waters

In addition to the state regulatory process, there is also a complex regulatory landscape for aquaculture project in federal waters off California.
Permitting Pathways for Aquaculture in Federal Waters

This section summarizes the complex process to permit commercial aquaculture in Federal waters off the coast of California as depicted on slides 57 and 58 and provides insights gained through interviews with selected stakeholders.

- Commercial aquaculture permitting in federal waters, as with permitting in state waters, requires an applicant to interact with multiple local, state, and federal regulators that must approve the proposed project, as well as interested parties such as other landowners or tribal nations.
  - Slides 57 and 58 provide a list of these agencies and summarizes the permitting pathway.
  - The federal waters permitting process starts with consultations with the US Army Corps of Engineers (USACE) and the NOAA Regional Aquaculture Coordinator.
  - Because every project and applicant is unique, it is difficult to estimate the time and cost to obtain a federal aquaculture permit.
  - Time to obtain a permit can range from one to many years, while costs range from several thousands of dollars to several hundreds of thousands of dollars.
  - Costs include scientific studies, application fees, NEPA environmental reviews, consultant, and attorney fees.
- All permitting occurs in a public process and interested parties have multiple opportunities to share their opinions.
- Interested parties may also seek legal remedies.
Aquaculture Permitting Process in Federal Waters

**Project Design**
- Early Project Design
- Contact USACE and NOAA RAC Coordinator
- Meet with Agencies and Consultants*

**NEPA Process/Consultations**
- Submit Section 10 and/or 404 Permit Application(s)
- NEPA Process → Grant Permit

**State, Federal, and Local Permits/Entitlements**
- Other Necessary Entitlements
  - Individual permits are separate and happen concurrently
  - OSSP NOAA Contract (Shellfish only)
  - NPDES Permit (Finfish only)
  - Aquaculture Registration
  - Use or other local permits, if needed

**Project Operations**
- Ongoing monitoring, permit fees, and import requirements***

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*Shellfish projects will need to contact NOAA’s Seafood Inspection Program, USFSA, and CDPH.

**The EFH/ESA consultations are associated with the Corps Section 10 permit and separate from NEPA.

***CDPH involved in landing products only.
### Aquaculture Permitting Process Key

<table>
<thead>
<tr>
<th>Color</th>
<th>Agency/Department</th>
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<tbody>
<tr>
<td>Applicant/Farmer</td>
<td>California Coastal Commission</td>
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<tr>
<td>CCC</td>
<td>California Department of Fish and Wildlife</td>
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<tr>
<td>CDPH</td>
<td>California Department of Public Health</td>
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<tr>
<td>CFGC</td>
<td>California Fish and Game Commission</td>
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<tr>
<td>CSHRC</td>
<td>California State Historical Resources Commission</td>
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<tr>
<td>Water Boards</td>
<td>California State Water Resources Control Board/California Regional Water Quality Control Boards</td>
</tr>
<tr>
<td>Local</td>
<td>Cities/Counties</td>
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<tr>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<tr>
<td>NOAA/NMFS</td>
<td>National Oceanic and Atmospheric Administration/National Marine Fisheries Service</td>
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<tr>
<td>SHPO</td>
<td>State Historic Preservation Officer</td>
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<tr>
<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
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<tr>
<td>USCG</td>
<td>United States Coast Guard</td>
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<tr>
<td>USDA</td>
<td>U.S. Department of Agriculture</td>
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<tr>
<td>USEPA</td>
<td>U.S. Environmental Protection Agency</td>
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<td>USFDA</td>
<td>U.S. Food and Drug Administration</td>
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<td>USFWS</td>
<td>U.S. Fish &amp; Wildlife Service</td>
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<tr>
<td>Tribal Nations</td>
<td>Tribal nations recognized by state or federal governments</td>
</tr>
</tbody>
</table>
Project Design Phase - Early Design and Consultation

Similar to aquaculture projects in State waters, early project design and consultations for projects in Federal waters can minimize the time and cost to navigate the regulatory process.

• Even though the aquaculture project will occur off the coast of California, most of the permitting will be handled by federal agencies who have jurisdiction for projects in federal waters.

• An applicant is well served by identifying key elements of its project in as much detail as possible as early as possible.
  
  • Key elements include details such as a spatial siting analysis, a marine engineering analysis, a proposed farm construction plan (with ancillary structures or infrastructure), a proposed farm operations and maintenance plan (with best management practices and applicant monitoring activity), a contingency plan, a Navigation Hazard Risk Assessment, biological resource information, source of seeds, biotoxin testing, access and onshore support, relevant qualification and experience, and operational flexibility and adaptation.


• Contact the USACE and the NOAA Regional Aquaculture Coordinator (RAC).

• After consultation with the applicant, the RAC may set up initial consultations with other state, federal, and/or local agencies who will provide early feedback and help the Applicant refine its project before moving forward.

• This is also a good time for initial consultations with tribal nations, local municipalities, and local stakeholders.

• Next step is to apply for Section 10 and/or 404 permits from the US Army Corps of Engineers (USACE).
Apply for the Requisite Army Corps of Engineers Permit(s) (includes NEPA process)

- Applicants must complete and submit an application to the United States Army Corps of Engineers (USACE) for a Section 10 Permit and a Section 404 Permit.
- **USACE Section 10 Permits** are required to protect navigation for commerce.
- **USACE Section 404 Permits** are required for discharges of dredged or fill material into waters of the US.
  - Any project that disturbs or adds material to the ocean floor will require a 404 permit or verification.
- Types of Section 10 and 404 permits include:
  - **General Permits (GP)**: GPs are intended to streamline the authorization process for defined categories of activities that only result in minimal adverse environmental effects. GPs include:
    - Nationwide Permit (NWP) 48* – Commercial Shellfish Mariculture Activities
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    - NWP 56 – Finfish Mariculture Activities
  - **Individual Permits (IPs)**: IPs are customized for specific activities that do not qualify for a GP.
    - **Letters of Permission (LOP)**: An LOP is a type of individual permit specific only to Section 10 and is issued through an abbreviated processing procedure. This process includes coordination with other Federal and state agencies and a public interest evaluation but does not require the publishing of an individual public notice.
- **USACE will initiate and lead the NEPA environmental review process (discussed further on the next slide).**

* NWP 48 is currently subject to litigation in Washington.
The NEPA Process

- The National Environmental Policy Act of 1969 (NEPA) and the Council on Environmental Quality's (CEQ's) NEPA implementing regulations (40 CFR Parts 1500-1508) establish a process to review the environmental impacts of the project and ensure that environmental concerns are examined and alternatives considered prior to the USACE making the final decision on a project or action.

- USACE will prepare either an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) that describes the environmental impacts of a project and discusses alternative actions and mitigation measures.

- USACE will also seek input from NOAA/NMFS for EFH and ESA consultations, as well as USEPA for WQ and 401 permits.

- An EIS can be a lengthy, complex document, requiring substantial time and cost. An applicant may be asked to fund the cost of an EIS.

- An EA is generally more focused and less complex, costly, and time-consuming.

- The EIS or EA is meant to inform and allow stakeholders to offer comments so the responsible agency can make an informed decision regarding a potential project.

- Further information about how the USACE implements NEPA can be found here.
Regulatory Landscape: Federal Waters

Consistency Certification from the California Coastal Commission

• The California Coastal Commission’s (CCC’s) Consistency Certification review process is separate from the NEPA process, but the Certification must be issued prior to USACE permit(s).
• The Federal Consistency Unit of the CCC implements the federal Coastal Zone Management Act (CZMA) of 1972 as it applies to federal activities, development projects, permits and licenses, and support to state and local governments.
• Aquaculture projects in federal waters are subject to Coastal Commission review, and applicants should review the Federal Consistency Program webpage and the CCC’s Federal Consistency in a Nutshell the for guidance. In addition, the applicant should contact staff of the Energy, Ocean Resources, and Federal Consistency Division at the Commission’s South Central Coast office in Ventura as well as the CCC’s Federal Consistency Coordinator.
• The Consistency Certification review process is for projects requiring a federal permit, authorization, or funding, while consistency determinations are submitted by federal agencies for their projects and activities.
• Aquaculture applicants must apply to the CCC for a Consistency Certification. There is no standard application form, and applicants may use any format they choose to satisfy the information requirements. See the Federal Consistency Program webpage for "sample" consistency certification formats for guidance.
• The Consistency Certification review period is up to 6 months. An applicant may extend this time period.
• The time period for review begins when the CCC receives the applicant’s consistency certification application and all necessary data and information. CCC staff will work with the applicant to ensure that all necessary data is submitted.
• Following receipt of this material, Commission staff prepares a staff report and recommendation for Commission action.
• After public notice, the Commission, holds a public hearing and decides to concur with or object to the consistency certification.
Other Consultations/Permits during the USACE Permit Process*

- USACE will consult with **NOAA Fisheries** (and/or **USFWS** if applicable) before taking any action that may:
  1. affect an endangered or threatened species under the Endangered Species Act (ESA),
  2. affect essential fish habitat (ESH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and
  3. lead to an unlawful taking of a marine mammal under the Marine Mammal Protection Act (MMPA).

- USACE will consult with the **US Coast Guard (USCG)** to acquire and perform:
  - Private Aids to Navigation (PATON) consultation: USCG has authority to control private aids to navigation (such as buoys) in waters of the US.
  - Navigation Assessment: although an assessment is not formally required, precedent has been established for aquaculture projects in offshore waters for the USACE to ask the USCG to assess the impact of an aquaculture project on navigation.

- USACE will consult with **USEPA**.
  - Aquaculture projects which discharge pollutants are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit under Section 401 of the Clean Water Act.
  - Shellfish and microalgae operations that add no substances or materials to the waters may not be required to obtain an NPDES permit.

- USACE will consult with **Tribal Governments**.
  - Section 106 of the National Historic Preservation Act mandates that tribal governments be consulted in order to establish if the proposed project is on or near tribal lands of importance.
  - The Advisory Council on Historic Preservation (ACHP), an independent federal agency, is provided a reasonable opportunity to review and comment on the impact of an aquaculture project in federal waters on historic resources.

* These consultations are separate from the NEPA process
Additional State and Federal Permits and Authorizations

**USFDA/NOAA SIP and CDPH (NSSP)**

- USFDA is the National Shellfish Sanitation Program (NSSP) point of contact for public health, and the NOAA Seafood Inspection Program serves as local “boots on the ground” for FDA.
- The NSSP is the federal/state cooperative program recognized by the U. S. Food and Drug Administration (USFDA) and the Interstate Shellfish Sanitation Conference (ISSC) for the sanitary control of shellfish produced and sold for human consumption.
- Aquaculture operators will enter into an MOU between CDPH, the harvester, the dealer (as defined by NSSP), and NOAA about how aquatic organisms are brought to shore and handled.

**USEPA**

- Finfish aquaculture applicants may need to obtain an NPDES permit from USEPA.

**California Department of Fish and Wildlife (CDFW)**

- State Aquaculture Registration Program: All aquaculture projects in federal waters must be annually registered with the State Aquaculture Registration Program.
- CDFW may provide comment letters during the NEPA stage and during specific agency permitting on issues related to aquatic health management and disease response, and potential project interactions with fishing.

**Local Use Permits**

- Depending on the location, aquaculture applicants may need a variety of local permits associated with onshore or nearshore operations such as water access, fire prevention, and a business license.
- In addition, applicants may need to consult with ports, harbors, and native tribes.
Project Operations and Agency Oversight

USACE

- May conduct compliance review or inspection of the aquaculture facility. Review can range from a request for data to conducting an on-site inspection.

USFDA

- Responsible for oversight and enforcing all NSSP testing and compliance.

NOAA/NMFS

- Ongoing oversight to ensure no violations of the Endangered Species Act.

California Coastal Commission

- Ongoing oversight of operations to ensure compliance with Consistency Certification conditions.

USEPA

- Where applicable, USEPA may inspect a facility to determine compliance with an NPDES permit.
Conclusions and Recommendations

Definitive steps can be taken to improve the regulatory environment and gain trust from all stakeholders.
Overview of CEA Recommendations

CEA recommends the following actions to help more conservation, restoration, climate, research, food production, and other commercial aquaculture activities move forward in California. These actions could support California’s broader efforts to prioritize conservation and restoration* and strengthen resilience in the California grown food sector. Each recommendation will require substantial investments of time, energy, and resources from a variety of stakeholders to create change. The recommendations are summarized below and discussed in more detail in the following slides.

1. Garner executive, legislative, and agency leadership support for increased sustainable marine aquaculture, and develop a vision for marine aquaculture in California.

2. Develop a strong science-based California Aquaculture Action Plan that provides options, scenarios, and/or targets for a sustainable marine aquaculture portfolio that supports healthy ecosystems and communities and incorporates recommendations three through six. Use this process to create momentum for change.

3. Provide new and additional resources (staff and funding) to state agencies to review and approve an anticipated increase in proposed projects and conduct ongoing oversight and enforcement activities to ensure permit conditions are met.

4. Improve and expedite the permit process while maintaining high standards for the environment, food safety, and community well-being. Create timing and cost certainty for project applicants. Develop and implement clear and consistent oversight and enforcement programs.

5. Build agency and stakeholder trust and buy-in by increasing knowledge and awareness of the current state of aquaculture science and getting agency agreement on criteria for scientific information and research that agencies will accept to inform permitting decisions.

6. Create priority permitting pathways for projects that provide identified needs. Possible priorities include projects that contribute to restoration or conservation needs, climate benefits, economic development for disadvantaged communities, tribal nations access to historical foods, or resilience to ongoing drought conditions.

*In 2020, an executive order was signed by Governor Gavin Newsom to ‘implement actions to increase the pace and scale of environmental restoration and land management efforts by streamlining the State’s process to approve and facilitate these projects.’ The broader initiative is called Cutting the Green Tape.
Recommendation 1: Garner Leadership Support and Develop a Vision for Aquaculture in California

Garner executive, legislative, and agency leadership support for increased sustainable marine aquaculture and develop a vision for marine aquaculture in California.

Aquaculture permitting is an involved process where multiple state and federal agencies balance and evaluate a variety of issues. A key lesson learned from other states and issues in California is top-down support is essential to prioritize the resources needed to support sustainable outcomes. California leaders at the executive, legislative, and agency level will need to make marine aquaculture a higher priority and take action to create the necessary change for restoration, conservation, climate, research, food production, and other aquaculture to flourish in the state.

An important initial step in this process will be for California to develop a clear vision for aquaculture. As noted in this report, there are a variety of views on the role aquaculture should play in California’s blue economy. Some stakeholders emphasize the need to consider marine aquaculture’s role in supporting resilience and sustainability in the State’s seafood and food supplies; others were concerned about industrialization of the ocean/coastline.

Multistakeholder discussions where views can be voiced and vetted and regional and/or local stakeholders can contribute to decisions about sustainable aquaculture in their area will be an essential part of defining the vision and balancing stakeholder views with the State’s needs and priorities.

Once the vision is defined, substantial investments will be needed to implement the changes discussed in this report and allow aquaculture projects to move forward in a timely or expedited manner.
Recommendation 2: Develop a Strong, Science-Based California Aquaculture Action Plan

Develop a strong science-based California Aquaculture Action Plan that provides a variety of options and scenarios for a sustainable marine aquaculture portfolio that supports healthy ecosystems and communities.

The Aquaculture Action Plan development process is an excellent opportunity to create a vision for aquaculture in California that specifies how the state wants to pursue seaweed, shellfish, and finfish aquaculture in state waters. OPC convened an interagency working group to guide the planning process and help identify resources needed to implement the State’s vision. A draft plan is in development.

The forthcoming public process to gather comments on the draft plan (anticipated in mid 2023) is an opportune moment to vet stakeholder perspectives and decide how best to encourage a portfolio of projects that meet the state’s varied goals and support healthy ecosystems and communities. Understanding and incorporating the most recent science will be an essential foundation to achieving this balance.

Once the vision is defined, the Action Plan should outline the necessary steps needed to implement the vision. Key to implementation will be increasing agency resources, educating stakeholders, and investing in further science and research. This approach is in line with the 9/17/20 OPC staff report (see box at right).

Well designed action plans in other states (e.g., Alaska) are yielding positive results. A successful California plan will include:

- Specific targets based on the best available science designed to help shape and implement the state’s vision (see Appendix D for a possible approach to setting targets developed by UCSB).
- A process to develop marine spatial planning to identify areas that may be suitable for aquaculture and preferred type/scale.
- Improvements to the permit process as well as actions to make agency oversight and enforcement activities more transparent and effective (see Recommendation 3).
- Incorporating the most up-to-date science now and in the future (see Recommendation 4).
- An estimate of the needed staff and sources of state, federal, and private funding to support plan implementation (see Recommendation 5).

Finally, the plan should identify projects that meet a variety of the state’s goals and could qualify for priority permitting pathways (see Recommendation 6).
Recommendation 3: Fund State Agencies

Provide new and additional resources (staff and funding) to state agencies to review and approve an anticipated increase in proposed projects and conduct ongoing oversight and enforcement activities to ensure permit conditions are met.

All stakeholders CEA interviewed recognized the need to provide additional staff and resources to state agencies to manage the existing suite of aquaculture projects in the State, let alone meet any future increases. Additional knowledgeable agency staff is essential to address current staffing shortage and manage expected future retirements.

Agency activities span initial permitting, as well as ongoing oversight and enforcement activities. The State must provide adequate resources for agencies to review lease applications, conduct CEQA and other permit reviews in a timely manner, and to monitor and enforce permit conditions and requirements (e.g., staff and training).

Early (upfront) and ongoing state and federal agency collaboration to identify issues and agree to mitigations and ongoing oversight conditions can provide more certainty for the applicants and allow agencies to plan needed enforcement resources. This collaboration and upfront work will require agency staff time to work with their sister agencies and develop new tools (e.g., via best management practices (BMPs) or standard permit conditions) and guidance documents for applicants. Oversight and enforcement conditions also should be based on the best available science as advised by a science advisory group (see Recommendation 4) and will require collaboration with the scientific community. Developing these tools is resource intensive but can also serve as a way to document institutional knowledge and ultimately reduce workload and address retirements.

Given the relatively small number and size of the current aquaculture industry and the need for restoration, conservation, climate, and research activities, state and federal agencies (and possibly some targeted private philanthropy) will need to cover most of these costs. Application and permit fees will be insufficient. Another option is to create a credit program for ecosystem services provided by all types of aquaculture and establish a market for the credits.
Conclusions and Recommendations

Recommendation 4: Improve the Permitting Process

Improve and expedite the permit process while maintaining high standards for the environment, food safety, and community well-being.

Multiple efforts across the county have identified and demonstrated ways to improve aquaculture permitting. CEA reviewed previous efforts and combined with stakeholder interviews recommend the following actions to improve California permitting. Note the following recommendations apply to all types of aquaculture (conservation, restoration, climate, research, food production, etc.) as all projects go through a similar permitting path. The table below shows previous recommendations; CEA’s recommendations are on the following slides.

<table>
<thead>
<tr>
<th>Previous Recommendations from Other Studies</th>
<th>CA Shellfish Initiative</th>
<th>Earth Resource Permitting Recs</th>
<th>CA Multi-Agency Principles</th>
<th>Columbia Seaweed Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve interagency coordination to simplify the permit application process without compromising environmental review</td>
<td>✔</td>
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<tr>
<td>Provide additional resources to agencies to permit, monitor, and enforce permit conditions</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>Identify and/or prioritize state water bottom lease areas for seaweed and/or shellfish farms in designated areas or create criteria to do so</td>
<td>✔</td>
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<td>Prepare a programmatic environmental impact report or conduct “pre-permitting” for aquaculture in selected areas</td>
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<tr>
<td>Develop standard permit conditions and/or best management practices (BMPs)</td>
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<td>Create a single application and data requirements for applicants and/or designate a single agency to determine if applications are complete (for all needed permits)</td>
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<tr>
<td>Develop public interest criteria that balance climate goals and environmental stewardship</td>
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<td>Create a new categorical exemption from CEQA for certain types of seaweed farming</td>
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<tr>
<td>Create experimental permits with expedited permitting for small, experimental projects</td>
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<tr>
<td>Develop a tiered permitting approach tied to impact thresholds that determine the level of agency review</td>
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<tr>
<td>Incorporate best available science and/or create a scientific technical committee to advise permitting</td>
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</table>
Conclusions and Recommendations

Recommendation 4: Improve the Permitting Process (continued)

*Improve and expedite the permit process while maintaining high standards for the environment, food safety, and community well-being.*

- **Explore programmatic approaches for aquaculture.** These efforts may be easier to undertake by species and/or region. Programmatic approaches could take the form of targeted regional EIRs, standard permit conditions, and/or BMPs.

- **Continue to improve coordination between state agencies.** Continue to convene the interagency aquaculture working group and expand to include federal agencies. Keeping agencies in close coordination will help prioritize activities, promote information exchange, achieve consensus, and build trust among regulators. Good examples of California interagency coordination to expedite permitting processes includes fire hazard reduction/forest treatments, offshore wind, and the Bay Area interagency collaboration (BRRIT) to improve the permitting process for multi-benefit habitat restoration and other projects.

- **Make the CEQA process more efficient, less expensive, and faster.** Consider consolidating the permitting process for specified aquaculture projects to fewer (or even one) agency. Promote legislation enabling CDFW to charge fees to cover the costs of CEQA for bottom lease applications. Consider BMPs for certain elements within CEQA.

- **Develop a single permit application for all state agencies and a common information sharing platform.** This would require agencies to develop common data requirements and agreement on what studies/data will be accepted by all agencies. Once this is accomplished, a single agency can be appointed to determine an application’s data adequacy.

- **Identify opportunities for regulator and applicant training** to build agency capacity and help applicants navigate the application process.

*Continues on next slide*
**Recommendation 4: Improve the Permitting Process (continued)**

*Improve and expedite the permit process while maintaining high standards for the environment, food safety, and community well-being.*

**Update the State Aquaculture Portal** to ensure it has the most up-to-date information and to **create and incorporate improved permitting tools for aquaculture applicants** (consider several of the tools included in the Alaska portal). Making more descriptive process information, flow maps, agency contacts, and GIS/Mapping data for siting (spatial planning) available online will allow all parties to see the same information that informs site selection and add an additional layer of transparency. Note this is an excellent area for California and NOAA to work together; NOAA has a variety of small business, science, and other grants (e.g., Sea Grant) which could support these types of efforts.

**Improve Collaboration**

While agency collaboration has improved in recent years, more is needed. **Early (upfront) and ongoing state and federal agency collaboration to identify issues and agree to applicant mitigations/ongoing monitoring conditions can provide more certainty for applicants and allow agencies to plan needed enforcement resources.** This collaboration and upfront work will require agency staff time to work with their sister agencies and develop new tools (e.g., via BMPs or standard permit conditions) and guidance documents for applicants. Monitoring and permit conditions also should be based on the best available science as advised by a science advisory group (see Recommendation 5) and will require collaboration with the scientific community. Improving the permitting process will be resource intensive for agencies and will have to be adequately funded to be successful (see Recommendation 3).

- Agency oversight and enforcement responsibilities must be clear and consistently applied so all stakeholders have confidence projects are implemented as envisioned.
- Consolidate reporting requirements so farmers/permit holders can prepare a single report that is then disseminated to the various agencies.

**Improve and clarify applicant monitoring and agency oversight and enforcement activities.**

- Applicant monitoring is critical, but it can be expensive and prevent farms from being economically sustainable and severely limit the probability of success for smaller projects. Agencies can default to the precautionary principle due to limited capacity, which in turn can lead to extensive applicant monitoring requirements. There is a strong body of research and proven monitoring strategies from operations in other states and countries that can be used as a foundation for developing monitoring requirements for California projects that meet the needs of all parties.
Areas to Improve California Aquaculture Permitting Process

- Early Project Design
- Contact State Aquaculture Coordinator (SAC)
- Meet with SAC and Project Coordinating Team (PCT)
- Submit Bottom Lease Application to Fish and Wildlife Commission
- CEQA Process
- Commission Lease Approval
- State and Federal Multi-agency Permitting
- Ongoing oversight, monitoring and permit fees

Farmers make early decisions without complete information.

This process is getting clearer with the CDFW permitting portal but could be stronger.

CEQA analysis is costly, lengthy, and results in unknown outcomes/mitigations. This level of uncertainty deters projects or sidelines them.

Agencies are not consistent in their analysis or requirements. Post CEQA, additional requirements can be layered onto CEQA mitigations - creates more uncertainty, delays, and costs.

Uncertain what ongoing requirements will be.
Conclusions and Recommendations

Areas to Improve California Aquaculture Permitting Process

Early Project Design → Contact State Aquaculture Coordinator (SAC) → Meet with SAC and Project Coordinating Team (PCT) → Submit Bottom Lease Application to Fish and Wildlife Commission → CEQA Process → Commission Lease Approval → State and Federal Multi-agency Permitting → Ongoing oversight, monitoring and permit fees

Farmers make early decisions without complete information.

Regional spatial planning could direct farmers to areas with fewest conflicts.

This process is getting clearer with the CDFW permitting portal but could be stronger.

Existing structure creating an agency point person, agency collaboration, and online portal can be leveraged to create more permitting efficiencies.

CEQA analysis is costly, lengthy, and results in unknown outcomes/mitigations. This level of uncertainty deters projects or sidelines them.

Agencies are not consistent in their analysis or requirements. Post CEQA, additional requirements can be layered onto CEQA mitigations - creates more uncertainty, delays, and costs.

Programmatic permitting, standard permit conditions/BMPs, stronger interagency coordination, and dedicated permitting and oversight/ enforcement staff could alleviate uncertainties and improve efficiency.

California Aquaculture Views and Recommendations for Moving Projects Forward
Recommendation 5: Build Trust through Sound Science

Build agency and stakeholder trust by increasing knowledge and awareness of the current aquaculture science, agree to criteria for scientific information that agencies will accept to inform permitting decisions, and identify and promote additional research.

There is a robust and growing body of science guiding all marine aquaculture activities. A growing body of science is: 1) showing careful siting can help to mitigate most impacts to ecosystems, species, and other ocean users, and 2) identifying best conservation and restoration practices. There will always be a need for more science to fill knowledge gaps and keep information current under changing conditions (e.g., changing ocean conditions due to global warming). However, existing research has built the scientific understanding about many relevant marine aquaculture risks and benefits and identified best management practices. Much of this research has been conducted by universities and science organizations in California (e.g., University of California, Santa Barbara and University of California, Davis). The state needs to invest resources to create a science-led aquaculture program that incorporates the most up-to-date scientific information into the permitting process.

The State can also further aquaculture by defining and developing criteria for scientific research permits for marine aquaculture. These activities will build on existing research to fill knowledge gaps and capture data to improve knowledge and understanding of specific positive and negative impacts in California’s ocean ecosystems and communities. Once the state has a vision for aquaculture (see Recommendation 1) it can prioritize and fund research gaps and develop criteria to prioritize and expedite scientific permits.

Additionally, creating a multi-disciplinary scientific advisory group or Blue-Ribbon Panel with relevant expertise (i.e., researchers with a history of relevant publications to address the issues on the table) can further guide aquaculture science priorities, policy, and permitting. The purpose of this group would be to create a direct and ongoing scientific link with policy makers and regulators so that the regulations can be continuously updated and informed by aquaculture science. This group should include researchers with ecological, biological (e.g., genetics, natural history), social, and economic expertise and could be expanded to incorporate experts and address issues on the entire west coast. The Aquaculture Action Plan process could be used to further refine this concept and discuss if this group could be an advisor to both regulators and applicants; if members are appointed, nominated, or volunteers; determine if this is also a venue to discuss aquaculture science or is more focused on facilitating permitting processes, etc.
Recommendation 6: Prioritize Projects with Restoration, Conservation, Climate, and Economic Development Benefits

*Create priority permitting pathways for projects that provide identified needs. Possible priorities include projects that provide restoration or conservation needs, climate benefits, economic development for disadvantaged communities, or tribal nations access to historical foods and cultural practices.*

California has an opportunity to achieve multiple goals with well thought out policies for marine aquaculture permitting. **Solidifying marine aquaculture goals (conservation, restoration, climate, and economic development) will allow agencies and stakeholders to identify and prioritize projects with restoration, conservation, climate, research, or economic benefits and prioritize activities to expedite those projects that help meet stated goals.** Work done on these priorities will likely benefit all marine aquaculture projects, as well (e.g., developing permitting tools will help all projects).

Based on CEA’s conversations, there are a variety of opportunities that could be prioritized. For example, the state could:

- Identify specific conservation and restoration projects (e.g., species enhancement or restoration) and take steps to create standard permit conditions to move them forward quickly.
- Work with NOAA to identify areas in state waters for sustainable commercial operations to provide needed local economic development benefits and/or climate benefits and undertake programmatic permitting to facilitate project development.
- In conjunction with tribal nations, develop projects that can be managed or co-managed by tribal nations and provide access to traditional foods, revive traditional customs, and/or provide needed job opportunities.

Regulators generally treat all aquaculture projects, regardless of intent, in a similar manner. Many aquaculture projects have conservation, climate, and restoration aspects and are designed to improve and/or support healthy ecosystems. Other projects may serve tribal or disadvantaged communities. While all projects require environmental review and need to be evaluated for risks and impacts, these beneficial outcomes will not move forward without some form of regulatory or permitting consideration.

**The key to unlocking these benefits is for the State to have clear polices and funding as outlined in Recommendations 1-5.**
Conclusions and Recommendations

Recommendation 6: Prioritize Projects with Restoration, Conservation, Climate, and Economic Development Benefits (continued)

An initial step is to educate regulators and other stakeholders about restoration, conservation, climate, research, or economic benefits so they can help facilitate the roll-out of prioritized projects across the state.

Examples from CEA interviews on information that should be more broadly shared include (note this list is not comprehensive):

- Oysters create essential coastal habitat and provide a variety of ecosystem benefits that have been documented by recent science. Restoring native oysters thus restores coastal habitat. In addition, native oysters and eelgrass have historically cohabitated and recent science suggests that where they grow together, coastal habitats may be especially resilient to climate effects. However, restoration of these species are permitted separately, and project goals are sometimes seen as being at odds with one another.

- Living shoreline efforts do not involve aquaculture and have a different permitting pathway. Living shorelines focus not only on improving habitat for native species, but on providing hard substrate to jump-start reef structure, and these structures increase the protection that native oyster restoration projects can offer human coastal communities.

- Conservation, climate, and restoration projects often rely heavily on the commercial sector for expertise, supplies, and capacity support (e.g., broodstock and grow out facilities). Identify and educate regulators and stakeholders about these important links between conservation and commercial efforts. Develop criteria for permitting pathways for joint projects and create incentives for the commercial operations to support or participate in these projects.

- Many commercial projects have positive impacts. For example, oysters can filter 50 gallons of water a day and seaweed can efficiently remove excess nutrients from the water. Shellfish and seaweed aquaculture can also provide habitat, while also providing more nutritious food with almost no reliance on fresh water sources (TNC overview), reducing pressure on California’s dwindling water supply. Strategically placing these projects could help offset other environmental issues, while creating jobs and providing sustainable food or climate benefits.

These and other points need to be documented and communicated to the regulators and other stakeholders to garner support for moving efforts forward to meet stated goals.
Recommendation 6: Prioritize Projects with Restoration, Conservation, Climate, and Economic Development Benefits (continued)

There are several additional steps that will help conservation projects move forward:

- **Engage with California Natural Resources Agency’s (CNRA) Cutting the Green Tape initiative to further explore how to simplify permitting pathways** for priority projects with restoration, conservation, climate, research, or economic benefits.

- **Definitions for conservation and restoration aquaculture will be essential to moving projects forward.** The Nature Conservancy (TNC) and UCSB recently released a paper (Mizuta et. al., 2022) that provides definitions for commercial aquaculture, conservation aquaculture, restorative aquaculture, and regenerative aquaculture that California could use to identify priority projects.

- Additional agency coordination and harmonization will be essential to increase the pace and scale of project approvals. The current system can leave projects in permitting limbo and, in some cases, disincentivize natural solutions and promote hard infrastructure since it is easier to permit. Substantial resources will be needed to incorporate science and align agencies.
Acronyms

Appendix A
<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
<th>Acronym</th>
<th>Description</th>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>ACHP</td>
<td>Advisory Council on Historic Preservation</td>
<td>ESA</td>
<td>Endangered Species Act</td>
<td>NWP</td>
<td>Nationwide permit</td>
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<td>AOA</td>
<td>Aquaculture Opportunity Areas</td>
<td>FONSI</td>
<td>Finding of No Significant Impact (NEPA)</td>
<td>OPC</td>
<td>Ocean Protection Council</td>
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<td>AOP</td>
<td>Aquarium of the Pacific</td>
<td>GIS</td>
<td>Geographic Information Systems</td>
<td>PATON</td>
<td>Private Aids to Navigation Permit</td>
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<td>BMPs</td>
<td>Best Management Practices</td>
<td>GP</td>
<td>General permits</td>
<td>PCT</td>
<td>Project Coordinating Team</td>
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<td>BRRIT</td>
<td>Bay Area Interagency Collaboration</td>
<td>IP</td>
<td>Individual permits</td>
<td>PEIS</td>
<td>Programmatic Environmental Impact Statement</td>
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<td>CASHPO</td>
<td>California State Historical Resources Commission</td>
<td>ISSC</td>
<td>Interstate Shellfish Sanitation Conference</td>
<td>RAC</td>
<td>Regional Aquaculture Coordinator (NOAA)</td>
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<tr>
<td>CCC</td>
<td>California Coastal Commission</td>
<td>LOP</td>
<td>Letters of Permission</td>
<td>ROD</td>
<td>Record of Decision (NEPA)</td>
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<td>California Department of Fish and Wildlife</td>
<td>MMPA</td>
<td>Marine Mammal Protection Act</td>
<td>SAC</td>
<td>State Aquaculture Coordinator</td>
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<td>CDP</td>
<td>Coastal Development Permit</td>
<td>MOU</td>
<td>Memorandum of Understanding</td>
<td>SHPO</td>
<td>State Historical Preservation Officer</td>
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<tr>
<td>CDPH</td>
<td>California Department of Public Health</td>
<td>MSA</td>
<td>Magnuson-Stevens Fishery Conservation and Management Act</td>
<td>SLC</td>
<td>State Lands Commission</td>
</tr>
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<td>CE</td>
<td>Categorical Exclusion (NEPA)</td>
<td>NCEAS</td>
<td>National Center for Ecological Synthesis and Analysis</td>
<td>USACE</td>
<td>U.S. Army Corps of Engineers</td>
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<td>CEQA</td>
<td>California Environmental Quality Act</td>
<td>NEPA</td>
<td>National Environmental Policy Act</td>
<td>USCG</td>
<td>U.S. Coast Guard</td>
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<td>CFGC</td>
<td>California Fish and Game Commission</td>
<td>NGO</td>
<td>Non-governmental organization</td>
<td>USDA</td>
<td>U.S. Department of Agriculture</td>
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<tr>
<td>CZMA</td>
<td>Coastal Zone Management Act of 1972</td>
<td>NMFS</td>
<td>National Marine Fisheries Service</td>
<td>USEPA</td>
<td>U.S. Environmental Protection Agency</td>
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<td>EA</td>
<td>Environmental Assessment</td>
<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
<td>USFDA</td>
<td>U.S. Food and Drug Administration</td>
</tr>
<tr>
<td>EFH</td>
<td>Essential Fish Habitat</td>
<td>NOI</td>
<td>Notice of Intent</td>
<td>USFWS</td>
<td>U.S. Fish and Wildlife Service</td>
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<td>EIR</td>
<td>Environmental Impact Report</td>
<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
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<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
<td>NSSP</td>
<td>National Sanitation Shellfish Program</td>
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</table>
Agency Guidance Documents

Appendix B
Multiple State and Federal Guides Have Been Developed to Guide Aquaculture in California and Nationally

The list below provides some of the primary resources.

**California Agencies**
- California Aquaculture Portal
- Permit Guide to Aquaculture in California
- CDP Application Guidance - Aquaculture and Marine Restoration
- CCC Federal Consistency Program webpage
- CCC’s Federal Consistency in a Nutshell

**NOAA**
- Guide to Permitting Marine Aquaculture in the United States (2022)
- National Shellfish Initiative
- Marine Aquaculture Policy

**USACE**
- How to Obtain a Permit

**USFDA**
- NOAA NSSP Guidelines

**Department of Commerce**
- Department of Commerce Aquaculture Policy
Stakeholder Views by Group

Appendix C
## Landscape Analysis Included a Broad Range of Interviewees

<table>
<thead>
<tr>
<th>Type</th>
<th>Number</th>
<th>When</th>
<th>Notes</th>
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<tbody>
<tr>
<td>Restoration Practitioners</td>
<td>7</td>
<td>October 2021 – November 2021</td>
<td>Researchers and staff from organizations engaged in ocean-based restoration (e.g., white abalone, Olympia oysters, living shorelines, etc.)</td>
</tr>
<tr>
<td>Commercial Producers</td>
<td>9</td>
<td>October 2021 – November 2021</td>
<td>Farmers and businesses engaged in marine aquaculture for profit (shellfish, seaweed, and finfish). Included operators of permitted farms, those seeking permits to farm, and those who sought permits unsuccessfully.</td>
</tr>
<tr>
<td>Environmental NGOs</td>
<td>12</td>
<td>December 2021 – January 2022</td>
<td>Staff publicly engaged in marine aquaculture development in California (e.g., submitting comments to public hearings for permits or proposed actions for marine aquaculture regulation). Interviewees had a wide range of views on aquaculture.</td>
</tr>
<tr>
<td>Tribal Nations</td>
<td>3</td>
<td>February 2022</td>
<td>Tribal nations or their representatives that are actively involved in aquaculture activities or publicly engaged in marine aquaculture development in California.</td>
</tr>
<tr>
<td>Agency Staff</td>
<td>16</td>
<td>May-July 2022</td>
<td>Staff from state and federal agencies engaged in permitting marine aquaculture for the purposes of restoration, conservation, and commercial production in California.</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td>November 2021 – December 2021</td>
<td>Consultants and staff from organizations with experience navigating specific agencies, programmatic permitting processes, interagency collaboration, etc.</td>
</tr>
</tbody>
</table>
Environmental NGOs have a Spectrum of Views on Aquaculture

- The majority are not opposed to some types of aquaculture if it is done 'right'
  - Some do not want any industrialization of the ocean
  - Others might support smaller, regional or local projects (most likely onshore)
  - Others are promoting sustainable offshore projects that would follow new federal guidelines
- Interested in moving restoration and conservation projects forward
  - Unaware of link between commercial and conservation efforts OR aware and unsure how to move those mixed projects forward
- More concerned about commercial operations
  - Near universal opposition to offshore finfish and highly skeptical of any finfish projects
  - No consensus on Humboldt onshore finfish- but more comfortable with onshore finfish
- Small, regional NGOs and some larger NGOs have little expertise/experience with aquaculture, but still engaged in some aquaculture projects at policy level or at the local level
- Most comfortable with the CCC and their staff, process, and decisions; CDFW seen as understaffed/overwhelmed
- Will not support “streamlining” as it is perceived as cutting corners; may support agencies clarifying requirements and coordinating efforts
  - Unclear how to improve the process given the various jurisdictions, responsibilities, and priorities
## Environmental NGOs have a Spectrum of Views on Aquaculture

<table>
<thead>
<tr>
<th>Against</th>
<th>Cautious Support</th>
<th>General Agreement</th>
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</thead>
<tbody>
<tr>
<td>Preserve CA ocean ecosystems—do not industrialize the oceans</td>
<td>Ban commercial offshore finfish projects</td>
<td>Move conservation, climate, and restoration projects that meet specific criteria forward</td>
</tr>
<tr>
<td>Implementation of commercial projects at a regional or local scale or offshore with high levels of review on ongoing agency oversight</td>
<td>Move conservation, climate, and restoration projects forward</td>
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</tbody>
</table>
Appendix C: Stakeholder Views by Group

Industry/Researchers/Others Feel Permitting Requirements are Not Clear and Agencies are Under Resourced

- Practitioners feel other stakeholders have a **strong bias against commercial aquaculture** based on historical data and negative experiences.
  - More recent data is not widely accepted, and if considered, it is discounted
- **Permitting and applicant monitoring requirements are a moving target**
  - CCC is the biggest wildcard due to its project-by-project approach that results in inconsistent requirements (note the CCC approaches all project evaluations in this manner)
  - Monitoring requirements can be burdensome and even project breakers in some cases
- The organizations that can afford to go through the long, difficult, and expensive permitting process are, for the most part, **larger for-profit operations**
- **Agencies are understaffed**
- Agencies could **improve coordination**
  - Applicants face multiple requests for the same information in different formats
  - Agencies require different information for similar analyses
- **Lack of agency experience** leads to little confidence in permitting marine aquaculture in California
  - Last new commercial lease granted ~20 years ago
  - **Default to “precautionary approach”** which leads to high costs for undetermined benefits
- **Strong agency oversight of operations is essential** to build trust in sustainable operations.
- A **programmatic approach could be useful and equally protective if well designed**
Tribal Nations Would Like to Renew Traditional Foods and Manage Resources

- Strong interest in **asserting Tribal rights to the nearshore waters and stewarding marine resources**
  - Interest in renewing access to historical diet and customs

- Could **explore managing or co-managing marine resources** (precedent in forestry)

- Tribal nations **may face similar permitting obstacles** depending on the project

- Aquaculture could provide **local economic development opportunities** for tribal members
  - Need education on possibilities and eventually job training/technology transfer

- **Engage coastal tribal nations to hear more voices, gauge interest, develop ideas, and have resources for follow-up actions**
  - Fatigue with endless processes to discuss issues and not resolve them
  - Subsistence, restoration, and commercial options are on the table—all options should be considered
  - Extremely constrained staff and bandwidth; pandemic has made this worse
Appendix C: Stakeholder Views by Group

Agencies Do Not Yet Have a Consensus View on Aquaculture

• Agencies do not have consensus views on how best to permit restoration, conservation climate, research, and commercial projects. Conservation, restoration, and climate aquaculture are not defined.

• Agency staff are balancing conservation and consumptive marine uses. Aquaculture seen as a consumptive use that may conflict or displace other uses.
  • Most of the coastline has high levels of conflicts (military, ports, fishing, recreation).
  • California agencies unclear about how offshore projects would be mitigated and monitored and do not have the bandwidth to develop solutions.
  • In the absence of information, it is unclear if there is a strong food or climate need for increased aquaculture, and given limited agency resources to permit and monitor projects, many agencies are lukewarm about growth in commercial operations in state or federal waters.

• Agencies do not have standard, public permit conditions to apply to projects or agreement on conditions across agencies.
  • Projects are referred to agency experts and reviewed one at a time.
  • Previous permit conditions can serve as a starting point for applicants.
Appendix C: Stakeholder Views by Group

Agencies Are Collaborating on Aquaculture, but Resources Are Constrained

• Until OPC launched the California Aquaculture Action Plan interagency workgroup, agencies did not have a consistent multi-agency venue to discuss aquaculture permitting, regulation, and enforcement issues.
  
  • The CA Agency Guiding Principles released in Spring 2021 was an initial effort to gain state agency consensus. The California Action Plan will guide implementation of those principles.

• Acknowledgement that there is a need for additional agency resources at every point along the aquaculture permitting, regulation, and enforcement path.

  • Most agencies often cannot manage existing aquaculture workloads.

  • CDFW lease application moratorium emblematic of the staffing shortage.

  • Unclear if legislature will provide additional funds.

• Also unclear if there is a broad understanding that industry and researchers will not be able to support increased fees to cover the costs of improved permitting and regulatory oversight.

• Hard for state agencies to participate in NOAA AOA process in federal waters due to limited resources and other priorities.

• Acknowledgement that industry fees on existing or future aquaculture projects will not be sufficient to augment agency staff.

• Concerns that any increase in marine aquaculture will further stress agency staff and will not allow projects to be permitted in a timely manner nor operations to be properly monitored.

  • Lack of agency oversight could erode public trust in sustainable aquaculture operations and could lead to negative environmental outcomes if permit conditions are not adhered to.

• If sufficiently staffed, agencies could act as problem solvers alongside industry.
CDFW and CFGC have Multiple Roles and Limited Staffing

- CFGC has not issued a new commercial aquaculture lease in more than 20 years and **declared a hiatus on new applications when they were overwhelmed** by three applications.
  - CFGC has authority for commercial aquaculture leases on ungranted state lands; SCL does all other types of leases (and SLC has infrastructure, process, and criteria for leasing).
  - CFGC does not have the authority to charge applicants for CEQA and does not have dedicated, experienced CEQA review staff.
  - CFGC is actively working on a process to guide public interest findings for aquaculture projects before the CEQA analysis; lack of a process or criteria temporarily stalled applications.
  - CFGC pause on applications is pushing future aquaculture operations to private lands and offshore.
- **Updating existing permits has strained CDFW staff.** It is hard to keep up with existing aquaculture projects, let alone process permits for new projects.
- In CDFW, while there is an aquaculture coordinator, multiple parts of the agency work on aquaculture permitting. But for the coordinator, **CDFW staff have multiple responsibilities in addition to aquaculture- limited time and bandwidth.**
  - Retirements (past and future) have or will result in loss in institutional knowledge.
- **OPC’s interagency workgroup can look at ways of restructuring permitting at CDFW and CFGC.**
  - Could make changes within CDFW to consolidate efforts.
  - Could consider moving some of aspects aquaculture permitting outside of CDFW.
Quantitative Approach to Sample Production Targets

Appendix D

Specific targets based on best available science can help shape and implement the state’s vision for future aquaculture production. The following slides summarize findings from a quantitative analysis performed by researchers at the University of California, Santa Barbara (UCSB) regarding a possible approach to setting targets for future production across the state.
A Quantitative Approach to Setting Production Targets in California

Research indicates SMART (Specific, Measurable, Achievable, Relevant, and Time constrained) targets increase program success. By setting SMART goals, California could measure success as well as re-assess progress at key milestones to take corrective action as well as help set expectations for the state and community.

Researchers at UCSB estimated production targets in California by synthesizing early taxonomic specific production (tonnes) patterns across 20 nations that are most similar to California to estimate mean growth rate, yield data from the primary literature to estimate the average amount of area required to meet those production targets, and then, based on average farm size in California, estimated the number of farms needed to meet production.

These targets were based on the earliest available growth patterns of similar countries for the following major taxa: seaweed, crustacean, finfish, and mollusk. The group then synthesized specific production (tonnes) and value (USD$) to estimate mean growth rate and the average amount of area required to meet those production rates. Number of farms needed to meet production is based on average farm size in the state.

Based on mean edible conversion factors, California could potentially expand aquaculture by the amounts shown in the following tables and could meet 2% of current California demand in 20 years (compared to the current 0.2%).

This method is one possible approach to setting production targets for the state moving forward. Questions regarding this approach can be directed to Dr. Caitlin Fong (fong@nceas.ucsb.edu).
## Estimated Potential Number of Farms

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<th>Current</th>
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<td>3</td>
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<td>3</td>
<td>64</td>
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<tr>
<td>Finfish</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>12</td>
<td>40</td>
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