



## **The California Department of Fish and Wildlife Aquaculture Program**

A Report to the Legislature  
in compliance with Fish & Game Code §15105,  
as amended by SB 809 (2017),

which states in part:

*"(c)...the department shall maintain internal accountability necessary to ensure that all restrictions on the expenditure of these funds are met and shall provide an accounting of the aquaculture program account balance and expenditures upon request of the Aquaculture Development Committee or the Joint Committee on Fisheries and Aquaculture..."*

*(e) The department shall prepare and submit to the Legislature on or before February 1, 2022, a report regarding the aquaculture program undertaken using revenues derived pursuant to that program, the benefits derived, and its recommendations for revising the aquaculture program requirement, if any."*

February 1, 2022

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## EXECUTIVE SUMMARY

Fish & Game Code § 15105, as amended by Senate Bill 809 (2017), directs the Department of Fish and Wildlife (CDFW) to prepare and submit to the Legislature a report regarding the aquaculture program undertaken using revenues derived pursuant to that program, the benefits derived, and its recommendations for revising the aquaculture program requirement, if any.

This report provides a short overview of the CDFW Aquaculture Program, a description of program activities undertaken during the past five years, a discussion of program funding, and general recommendations to address challenges.

Benefits derived from recent Aquaculture Program activities include the coordination of federal funding and completed first-phase population genetics research that has laid a foundation for future public-private-academic partnerships in conservation aquaculture and fisheries restoration efforts. Additionally, the development and maintenance of an online aquaculture permitting guide, a virtual permit counter coordinating tool, and the establishment of new administrative procedures are important first steps toward improved interagency coordination and permitting efficiency. However, program capacity challenges remain that constrain more effective oversight of aquaculture leasing processes that may currently be extremely protracted and uncertain for applicants.

Recommendations include reevaluating the efficiency of Aquaculture Program funding, specifically the need for broader support of CDFW programs (such as Marine Region, Fisheries Branch, and others) with natural resource management, oversight, and enforcement responsibilities related to commercial aquaculture. Potential funding solutions should recognize the nascent scale of California aquaculture development and the constrained access to opportunity posed by increasing upfront leasing or permitting costs as a means of fully funding the program.

Solutions that enhance public trust management and administrative capacity would allow for a smoother environmental review process, resulting in efficient processing of more commercial aquaculture permits and more equitable access to opportunity for new potential producers. Expanded aquaculture activity would then have the capacity to better contribute to state program funding needs and fulfill California's vision of an environmentally protective, robust and sustainable aquaculture industry.

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## The Department of Fish and Wildlife Aquaculture Program – Overview

The CDFW Aquaculture Program oversees California's diverse aquaculture industry. In conformance with statutory guidance from the Legislature, and through policies and regulations, CDFW and the Fish and Game Commission (Commission) balance the protection of natural resources and the development of sustainable commercial aquaculture.

## California's Aquaculture Industry – Overview

Commercial aquaculture in California is relatively modest in scale<sup>1</sup>, and can best be understood in terms of its *diversity*. Like the varied environments of the state throughout which aquaculture is practiced, many different species, raised for many diverse purposes, are cultured using a similarly-varied range of techniques. None of the species can be considered commodity products; each of them fit into fairly small-volume, high-value niche markets. They are specialty crops in a state - and country – where the vast majority of the United States seafood supply is imported, in a world where over half that supply now comes from aquaculture.



With origins dating back before statehood, California aquaculturists produce fish, shellfish, algae and seaweed for many different consumers and beneficiaries – including the deliberate restoration of species and habitats. Successful producers in California have adapted to a challenging landscape of high costs, global competitive forces, and climate change impacts even before the COVID pandemic. Local aquaculturists are applying lessons learned from the recent market and supply chain disruptions to improve, retool, and fine tune a safe and secure seafood supply while providing direct and ancillary benefits to their surrounding communities and ecosystems. The aquaculture sector, like

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<sup>1</sup> The [California Aquaculture Association](#) estimates a \$200 Million economic impact from aquaculture in the state. More specific metrics of farm-gate, or harvested value of aquaculture production from all sectors in the state are not definitive since there is no comprehensive, compulsory reporting of such data.

other food industries, is responding to the challenge of meeting a growing demand for commercially available seafood products while ensuring aquaculture practices adhere to environmental policies designed to protect marine and inland ecosystems. Delivering to wide-ranging markets demanding food, recreation, pets, research, and pharmaceuticals, the promotion and regulation of the industry is necessarily challenging and fragmented. Nonetheless, the potential for increased commercial aquaculture production in California (and the consequent public and private benefit) is substantial.

### **State Aquaculture Policy and Program Background**

The California Aquaculture Development Act of 1979<sup>2</sup> provides state policy direction, finding and declaring the practice of aquaculture to be in the interest of the people of the state, and that it should be encouraged to augment food supplies, expand employment, promote economic activity, increase native fish stocks, enhance commercial and recreational fishing, and protect and better use the land and water resources of the state. It further established a policy and program toward improving the science and practice of aquaculture as a means of expanding aquaculture industry and related economic activity in the state. Fish and Game Code § 1700 declares a statewide policy to encourage the conservation, maintenance, and utilization of the ocean and waters under the jurisdiction of the state for the benefit of the state citizenry and development of fisheries, including commercial aquaculture.

### **Aquaculture Development, Coordination and Management**

This statewide call for facilitating aquaculture was further supported in 1982 by the statutory re-organization of most aquaculture-related laws into Division 12 of the Fish and Game Code (§ 15000 et seq). This division includes an Aquaculture Development Section, which established an Aquaculture Coordinator within CDFW, and an Aquaculture Development Committee (ADC), bringing representation from each of the six agencies<sup>3</sup> having a role in its oversight

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<sup>2</sup> Public Resources Code, Ch. 4, [§826 et seq.](#)

<sup>3</sup> State agency representation on the [Aquaculture Development Committee](#) includes:

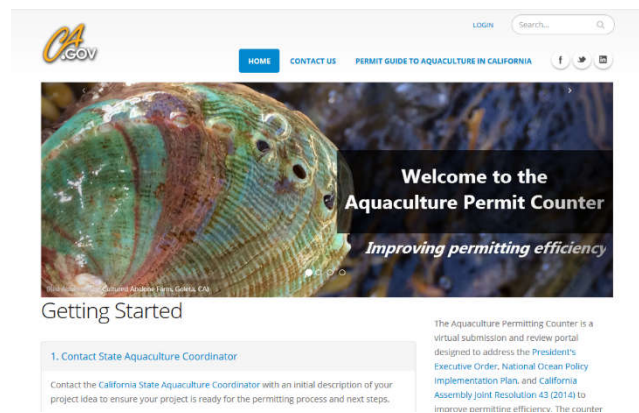
- Department of Fish and Wildlife
- Department of Food & Agriculture
- Department of Public Health
- State Water Resources Control Board
- State Lands Commission
- Coastal Commission
- Joint Legislative Committee on Fisheries & Aquaculture

together with legislative, academic and industry representatives. The ADC is convened by the Aquaculture Coordinator, and is advisory to the CDFW Director. The Coordinator and the ADC share responsibilities to identify opportunities for regulatory relief and facilitate industry development. Although employed within CDFW, the Aquaculture Coordinator has a unique, interagency coordinating responsibility interacting with public regulation of aquaculture at all levels of government<sup>4</sup>.

While implementing oversight of aquaculture development, the state is also directed to provide regulatory and administrative efficiency.<sup>5</sup> Orienting constituents to the complex permitting framework for aquaculture is a primary role of the Aquaculture Coordinator and is currently accomplished through a combination of online tools, outreach, coordination, and guidance. Some examples of tools that have been developed to serve these goals are described below.

**The Permit Guide to Aquaculture in California<sup>6</sup>** provides the primary portal to aquaculture permitting guidance in a continually updated, centralized online location. The guide conveniently links users to information from each of the state, federal, and local agencies with regulatory oversight of commercial aquaculture in California.

**The Aquaculture Permit Counter<sup>7</sup>** is a tool developed by the office of the State Aquaculture Coordinator for interagency coordination, with the goal of improving permit review efficiency. An online portal for sharing preliminary project application materials, the site is hosted by CDFW and may be used by all agencies involved in regulatory oversight of aquaculture (whether state, federal, or local). Project coordination teams are matched with applicants by the State Aquaculture Coordinator; the teams are then available to provide early, pre-



<sup>4</sup> Fish and Game Code [§15100](#)

<sup>5</sup> [Assembly Joint Resolution 43](#) (2014 Chesbro).

<sup>6</sup> Permit Guide to Aquaculture in California linked [here](#)

<sup>7</sup> Aquaculture Permit Counter linked [here](#).

application guidance that helps proponents refine project descriptions and siting or facility design plans that ensure environmental and regulatory compliance. The tool is not intended to replace the individual agencies' review processes, but to coordinate them in a way that reduces redundancy and surprises for both applicants and regulators. The Permit Counter has need for technical improvements that would enhance utilization and further its effectiveness, with funding to support implementation.

**General Aquaculture Program Guidance** - Media, public, legislative and agency leaders and their staffs also rely on the resources of the Aquaculture Program to better understand the state's aquaculture management framework, including the roles of various state, federal, and local agencies exercising authorities, oversight, and support of aquaculture. Challenges faced by the Aquaculture Program and opportunities to improve the State's aquaculture management framework are discussed below and in the Recommendations section.

**Marine Aquaculture Information Report** - In order to summarize existing information pertaining to marine aquaculture and environmental conditions within state waters, CDFW developed and submitted an Aquaculture Information Report (AIR)<sup>8</sup> to the Fish and Game Commission in May 2020. The AIR built a common understanding of existing commercial marine aquaculture activities, identified areas needing further refinement and consideration for future development, incorporated input received during the public review process, and is informing the development of a statewide Aquaculture Action Plan.

**California Ocean Protection Council and a new Statewide [Marine] Aquaculture Action Plan** - State law and the California Ocean Protection Council's *Strategic Plan to Protect California's Coast and Ocean*<sup>9</sup> (Strategic Plan) encourage the development of sustainable marine aquaculture that minimizes impacts to habitat, biodiversity, and wild fisheries and is consistent with local, state and federal statutes, policies and objectives. The Strategic Plan also calls for the development of a statewide Aquaculture Action Plan (Action Plan) that will create a comprehensive, consistent and science-based framework and policy for marine aquaculture in California. The Action Plan will focus on marine algae and shellfish in state marine waters and land-based/recirculating tank

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<sup>8</sup> AIR linked [here](#).

<sup>9</sup> [Strategic Plan to Protect California's Coast and Ocean, 2020-2025](#), California Ocean Protection Council.



operations for marine algae, shellfish, and finfish and is expected to be completed in 2023.

The Action Plan, which will be informed by best available science and a robust stakeholder engagement process, will identify areas of opportunity and avoidance, as well as minimum project criteria for minimizing detrimental environmental impacts, including best practices. It will also provide for community benefits such as equitable employment opportunities; enhanced local, safe and healthy food production and security; and reduced reliance on imported seafood produced by unsustainable aquaculture operations.

The following core concepts comprise the Aquaculture Principles<sup>10</sup> that are meant to inform the development of the Action Plan and provide guidance to agency staff in the near-term:

1. Develop and Utilize Best Available Science
2. Ensure Aquaculture Sustainability
3. Build Governance and Management Partnerships
4. Ensure Effective Aquaculture Planning
5. Develop and Implement Efficient and Effective Aquaculture Oversight
6. Protect Public Health and Food Safety

CDFW looks forward to further collaborative development of the Action Plan and anticipates the need for additional staff capacity that enables full implementation of management approaches resulting from the new Action Plan policies and framework.

### **Aquaculture Disease Committee**

Industry fish and shellfish health management is coordinated through the CDFW Fish and Shellfish Health Labs and the Aquaculture Disease Committee (Committee). Members of the Committee<sup>11</sup> consist of fish health and general disease specialists from within CDFW, the Department of Food and Agriculture, and academia, in combination with industry producers from varied marine and freshwater orientations. Subject matter expertise is also supplemented by private veterinary practitioners and pathology researchers as needed. The Committee is convened upon certain disease detections and as outlined in regulations<sup>12</sup> by

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<sup>10</sup> [Guiding Principles for Sustainable Marine Aquaculture in California](#), California Ocean Protection Council.

<sup>11</sup> Fish and Game Code [§15502 et seq.](#)

<sup>12</sup> California Code of Regulations, Title 14, [§245](#).

the Aquaculture Coordinator on behalf of the Director of CDFW. The Committee makes both incident-level and policy recommendations to the Director in order to contain and minimize aquatic animal disease impacts to natural resources and aquaculture businesses.

The Aquaculture Program also collaborates with the CDFW Fish and Shellfish Health Labs to coordinate and improve disease detection responses with interstate and federal counterparts that harmonize the containment of threats and ensure regulatory compliance.

### Other Program Activities



**Aquaculture Matters**<sup>13</sup> is a web-based education and outreach effort that began in 2014 and went online in early 2015. Its mission is to enhance the understanding of aquaculture in California on matters of policy, development, and current events. The site was created and is maintained by the Aquaculture Program with technical support from the CDFW webmaster and Data Technology Division. The site's charter incorporates each of the agencies of the ADC and encourages the perspectives of each through contributed content. Throughout the recent pandemic, the site has been utilized as a clearinghouse for COVID-related support information for impacted aquaculture businesses.

**Sacramento Perch Management** Building on recent population genetics research<sup>14</sup> funded by a State Wildlife Grant (SWG), a coalition of CDFW fisheries and Aquaculture Program personnel, along with academic and industry partners, continues efforts to re-establish and strengthen wild stocks and interest

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<sup>13</sup> <https://aquaculturematters.ca.gov/>

<sup>14</sup> Coen, A.E., M. Fish, R. Lovell, J. Rodzen, R. Schwartz, and A. Schreier. 2021. "High Levels of Genetic Divergence Detected in Sacramento Perch Suggests Two Divergent Translocation Sources." *Transactions of the American Fisheries Society* 150: 375-387.

in the conservation and captive breeding of Sacramento Perch. Identified federally as a Species of Greatest Conservation Need, this extraordinary native fish shows renewed promise as an aquaculture species (for both commercial producers and hobbyists) and commands a loyal following as a valued recreational angling species. The project is moving into a second phase of



Field Collection of Sacramento Perch for genetic testing and captive breeding planning.  
*Images courtesy of J. Mackay and R. Lovell (2015)*

active management to boost genetic diversity in populations of targeted waters and to enhance logistical efficiencies and responsiveness when obtaining stocks for translocation, conservation aquaculture, and captive breeding. This effort continues to provide a blueprint for public-private-academic fisheries and aquaculture partnerships into the future.

### **Presentations, Mentorships, and Policy Engagement**

Additional duties of the Aquaculture Coordinator<sup>15</sup> emphasize informational outreach and policy recommendations, which have been conducted in numerous settings for many diverse audiences including:

**Course lectures and presentations** to audiences at Scripps Institution of Oceanography, California State University's Moss Landing Marine Lab, University of California at Santa Cruz, Bodega Marine Lab (UC Davis), California Aquaculture Association, Pacific Coast Shellfish Growers Association, Association of Environmental Professionals, World Aquaculture Society, and the American Fisheries Society.

**Testimony at hearings** before the Joint Legislative Committee on Fisheries and Aquaculture, and the Fish and Game Commission.

**Project collaborations to enhance communication and messaging** that promote understanding of aquaculture among public agencies and the general public.

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<sup>15</sup> Duties of the Aquaculture Coordinator, FGC [§15100](#).

Examples include panel discussions at Aquarium of the Pacific, California Sea Grant, University of Southern California, and AltaSea at the Port of Los Angeles.

**Host mentorship opportunities** that foster individuals' growth through knowledge and understanding of aquaculture while making important contributions to Aquaculture Program goals. As examples, communications interns from the University of Southern California audited two existing Aquaculture Program websites and analyzed the approach and engagement metrics of both sites to address content gaps and improve user engagement. In a second instance, graduate students from the UC Santa Barbara Bren School of Environmental Science & Management surveyed and catalogued shellfish culture gear and methods throughout the state and initiated formative recommendations toward standardized terminology – a much needed foundational step to improve regulatory clarity in the management of aquaculture leases.

**Policy Working Groups** contributing to improved aquaculture management, regulation, and coordination, including shellfish best management practice planning and stakeholder outreach; a national framework for interstate harmonization of seaweed food safety regulatory approaches; interagency coordination of offshore aquaculture in Southern California; a national workshop on aquaculture-wildlife interactions and entanglement prevention strategies; seaweed aquaculture opportunities and constraints workshops; and the Aquaculture Leadership Team convened by the California Ocean Protection Council.

### **CDFW Aquaculture Program Tasks and Funding**

CDFW and the Commission are the principal state government entities responsible for the management, protection, and conservation of the state's fish and wildlife resources. As part of that duty, the two entities have been granted the authority and management responsibility to regulate certain aspects of commercial marine aquaculture on state lands or in state waters, including the allotment of state tidelands through the Commission. CDFW has management responsibility over the administration and oversight of these state water bottom leases. The Department's management authority also includes the registration of aquaculture facilities and species cultured within the state, the detection, control, and eradication of disease in aquaculture facilities, and the permitting and licensing of aquaculture-related activities such as stocking, broodstock collection, and importation.

The CDFW Aquaculture Program may be described in a narrow or broad sense in terms of funding, staff capacity, and the breadth of tasks involved in fulfilling the program's mission. Pursuant to Fish and Game Code<sup>16</sup>, revenues derived from aquaculture entitlements (including registrations, lease rents and privilege taxes, and permits) are restricted in their use and are expended solely on the CDFW Aquaculture Program via the program's dedicated account. As shown in the Fund Condition Statement<sup>17</sup>, these annual entitlement revenues have recently averaged roughly \$200,000, and have been comprised of the following categories in these approximate proportions:

Aquaculture Registrations	52 %
Lease Rents and Privilege Taxes	36 %
Miscellaneous Permits	12 %

Additional funding for the Aquaculture Program is supplemented by non-dedicated sources in the Fish & Game Preservation Fund. This combination of dedicated and non-dedicated funds is used to pay for the more narrowly-defined CDFW Aquaculture Program activities and expenditures, including the two permanent staff positions identified within the program: an Aquaculture Program Administrator and the Aquaculture Coordinator.

However, a much broader group of programs throughout CDFW and the Commission bears natural resource trustee, management, oversight, and enforcement responsibilities related to commercial aquaculture, which exert significant work and financial loads on those programs. In addition to the Aquaculture Coordinator and Program Administrator, the CDFW Aquaculture Program is functionally supported and draws on resources and expertise from:

- Marine and Inland Regional staffs
- Fisheries Branch (including Fish and Shellfish Health Labs)
- Information and Data Technology Division
- Law Enforcement, Legislative Affairs, License & Revenue, and Legal functions

The staff support provided by these cooperating CDFW programs is significant and is not directly funded by Aquaculture Program revenues. This assistance delivers crucial administration, technical management, and industry support and oversight. This includes the important role supporting the Commission and its

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<sup>16</sup> Fish and Game Code [§15105](#).

<sup>17</sup> See Appendix, Figure 4: Aquaculture Program Fund Condition Statement.



staff, especially with regard to the administration of aquaculture leases of state water bottoms and in making regulatory and environmental review recommendations.

Many projects have the potential to contribute significantly to state and local economies. However, because of staff and support limitations, lease application processing has been delayed, and/or proposals withdrawn or shifted by applicants to federal or local jurisdictions. This shift further reduces state program revenues. Projects facilitated by federal and local aquaculture development



Fish and Game Commissioners, staff, and CDFW Aquaculture Program visit shellfish-growing leases in Tomales Bay.

*images courtesy of J. Mackay (2015)*

initiatives still require coordinated engagement, environmental review, and recommendations from CDFW staff as the state's Trustee Agency for fish and wildlife resources.

### **Service-Based Budgeting**

Senate Bill 854 (2018)<sup>18</sup> directed CDFW to conduct a service-based budget review (SBB) to identify strategic goals reflecting its core programs. With the assistance of Deloitte, an independent entity having experience conducting similar efforts, CDFW's SBB review studied and is reporting on the service standards designed to meet its mission, focusing on staffing requirements and a comparison of the mission level needs against existing (or "service level") staffing. SBB allows CDFW to perform systematic, quantitative comparisons of the labor hours for its current (or "service") level of labor utilization versus the labor

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<sup>18</sup> Chapter 51, Statutes of 2018

hours it would require to meet its mandated mission across the entire breadth of tasks performed by CDFW staff.<sup>19</sup>

Organized into functional groupings, the SBB metrics as of July 2021 indicate that the overall Aquaculture “sub-program”, which includes all marine and inland aquaculture-oriented tasks, is operating at 43% of mission level (which equates to a 57% shortfall in the labor hours needed to fulfill the overall Aquaculture mission). However, a review of staff capacity to fulfill lease-oriented tasks shows that CDFW is operating at closer to 22% of mission level, which is a 78% gap (or shortfall) in staff capacity to meet CDFW’s responsibilities involving aquaculture leases.<sup>20</sup>

### **Aquaculture Program Challenges**

Improved internal coordination and procedures have been implemented through the recent addition of an Aquaculture Program Administrator. Measures to improve interagency coordination, oversight, and efficient management of the industry may be enabled through the implementation of further administrative enhancements and natural resource management capacity.

The broader CDFW Aquaculture Program is currently unable to adequately meet both current aquaculture oversight demands, and the anticipated proposals to expand aquaculture in both state and federal waters. The path to approval of new leases for marine aquaculture has been extraordinarily protracted and uncertain due to a variety of factors, including space use decisions in public waters that are highly complex and subject to a range of stakeholder perspectives and priorities. High standards of environmental compliance are critical to sustainable marine aquaculture development in California, as is the staff resource capacity to manage its implementation and respond to stakeholder concerns.

Aquaculture leases contribute to program revenue via base rents and *ad valorem* privilege taxes on harvested product. However, the number of leases or acreage under lease has not increased over the past two decades.

Aquaculture Registration fee increases intended to bolster program funding and originally enacted by Senate Bill 1886 (Chesbro, 2012) and extended by Senate

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<sup>19</sup> See: [The Service Based Budgeting Project at CDFW](#)

<sup>20</sup> See: Appendix, Figures 1-2.

Bill 809 (2017) have been shown to make only a marginal extra contribution due to the modest number of existing registrants.<sup>21</sup>

## **Recommendations**

Up-front registration fees that might be further increased to a level that fully funds the CDFW Aquaculture Program could put additional economic stress on the existing regulated community and raise the barrier to entry for new operations. The same could apply to a consideration of significantly increased lease rents for the small number of state-issued leases<sup>22</sup>. Approaches that foster local production and industry growth, while providing more sustainable program funding should be identified.

In the near term, the broader CDFW Aquaculture Program may continue to face difficulties in providing coordination, resource management, and administrative oversight.

California aquaculture development faces many challenges and opportunities, influenced by factors including rapid scientific and technical advances, changing global and local market forces, competing stakeholder and land-use priorities, and the expense and complexity of environmental and regulatory review, administration, and management. Creative solutions are needed that provide the catalyst that leads to sustainable long-term funding of the broader CDFW Aquaculture Program through expanded aquaculture and related economic activity, enabling California to fulfill its vision of a robust and sustainable aquaculture industry.<sup>23</sup>

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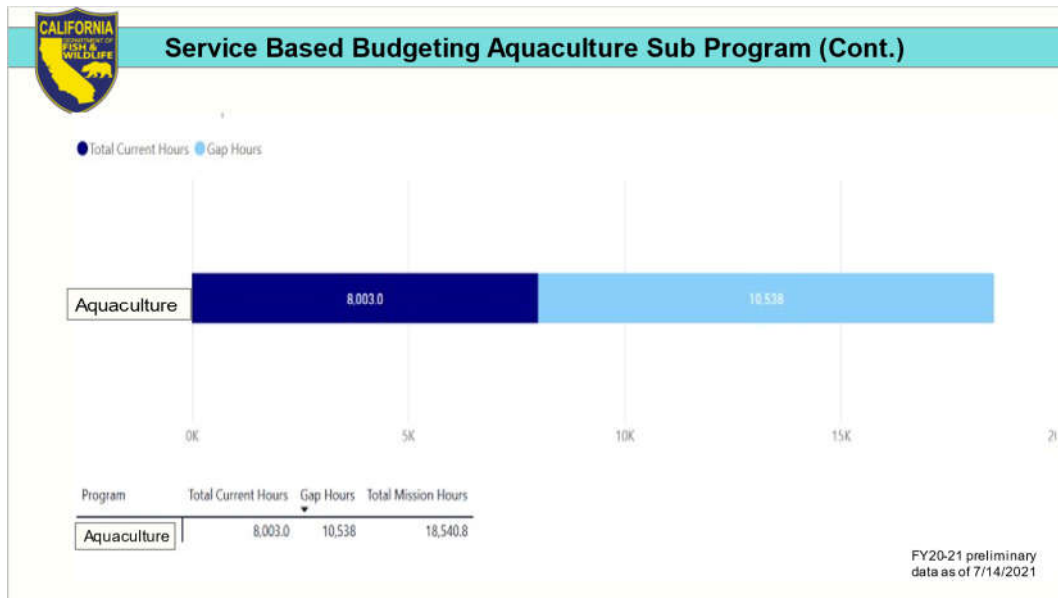
<sup>21</sup> See Appendix, Table 2 and [Report to Legislature – CDFW Aquaculture Program \(2017\)](#).

<sup>22</sup> There are seventeen state water bottom leases in California, as of Jan 2022.

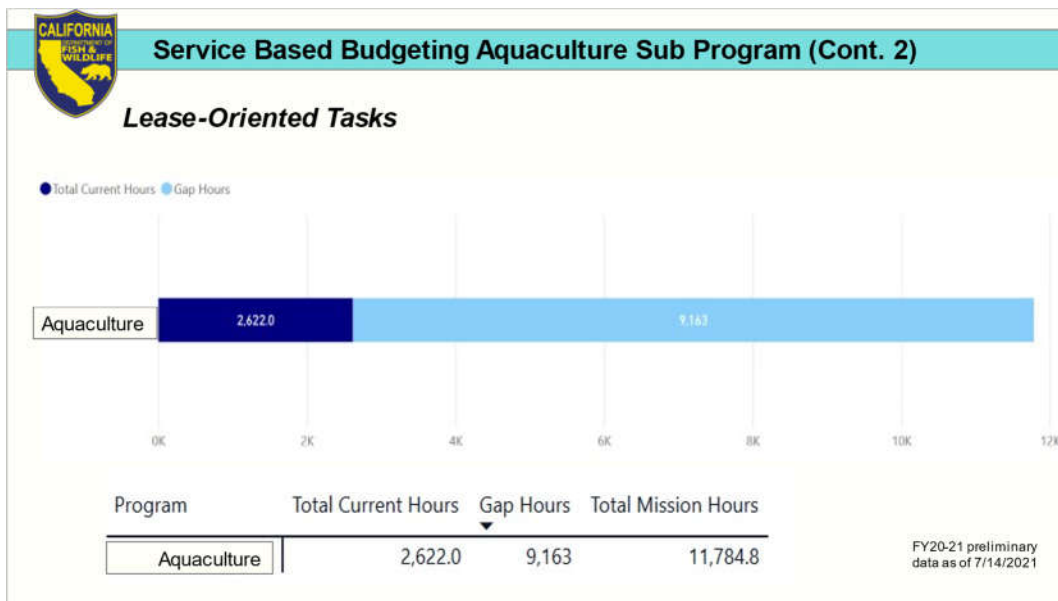
<sup>23</sup> As directed by Public Resources Code [§827](#) and Fish and Game Code [§15004](#).



Appendix



**Figure 1.** Aquaculture Sub-program (all inland and marine-oriented tasks). This figure depicts total Mission Level task hours vs. Service Level labor utilization (43%) for these tasks.



**Figure 2.** Aquaculture Lease-oriented tasks (marine only), depicting total Mission Level task hours vs. current Service Level labor utilization for these tasks.

**Appendix (continued)**

**CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE**  
**0200.13 AQUACULTURE PROGRAM**  
**FUND CONDITION STATEMENT**  
As of January 10, 2022

	<b>*Actual 2020-21</b>	<b>*Current Year 2021-22</b>	<b>*Budget Year 2022-23</b>
<b>BEGINNING BALANCE</b>	\$ 752	\$ 600	\$ 306
Prior Year Adjustment	(15)	-	-
Adjusted Beginning Balance	<u>\$ 737</u>	<u>\$ 600</u>	<u>\$ 306</u>
<b>REVENUES, TRANSFERS, AND OTHER ADJUSTMENTS</b>			
Revenues:			
4123000 Fish and Game - Licenses, Tags, and Permits	209	172	175
4123200 Fish and Game - Taxes	(6)	-	-
4129400 Other Regulatory Licenses and Permits	-	-	-
4162000 Investment Income - Pooled Money Investments	2	-	-
Total Revenues, Transfers, and Other Adjustments	<u>\$ 205</u>	<u>\$ 172</u>	<u>\$ 175</u>
Total Resources	\$ 942	\$ 772	\$ 481
<b>EXPENDITURES AND EXPENDITURE ADJUSTMENTS</b>			
Expenditures:			
3600 Department of Fish and Wildlife:			
State Operations	298	420	420
9892 Supplemental Pension Payments (State Operations)	8	8	8
9900 Statewide General Administrative Expenditures (Pro Rata)	36	38	32
Total Expenditures and Expenditure Adjustments	<u>\$ 342</u>	<u>\$ 466</u>	<u>\$ 460</u>
<b>FUND BALANCE</b>	\$ 600	\$ 306	\$ 21
Reserve for Economic Uncertainties	600	306	21

\*Dollars in thousands.

**Figure 3:** Fund Condition Statement (Revenues and Expenses)

**Figure 4: CDFW Aquaculture Registrations (calendar years 2017 – 2021)***(source: CDFW License & Revenue Branch)*

Year:	<b><u>2017</u></b>	<b><u>2018</u></b>	<b><u>2019</u></b>	<b><u>2020</u></b>	<b><u>2021</u></b>
Renewed Aquaculture Registrations	132	158	104	110	108
New Aquaculture Registrations	7	25	3	4	2
Surcharges (2nd tier)	64	48	52	55	53
<b>Total Registered Aquaculturists</b>	<b>139</b>	<b>158</b>	<b>107</b>	<b>114</b>	<b>110</b>