

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400



Th11a

Filed: 3/17/2019
180th Day: 9/13/2019
Staff: C. Teufel-SF
Staff Report: 7/24/2019
Hearing Date: 8/8/2019

STAFF REPORT: PERMIT AMENDMENT

Application No.: 1-93-73-A1

Applicant: Charles Friend Oyster Company

Location: Tomales Bay, Marin County.

Project Description: Request for after-the-fact approval to remove oyster cultivation equipment from within an area of leased state tidelands in Tomales Bay.

Staff Recommendation: Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

Under Coastal Development Permit No. 1-93-73, the Charles Friend Oyster Company (CFOC) maintains an oyster aquaculture operation in Tomales Bay on the approximately 62 acre State Water Bottom Lease No. M-430-04. In 2012, the California Fish and Game Commission subleased a roughly 2.8 acre portion of this area to another shellfish aquaculture operation, Starbird Mariculture. CDP No. 1-93-73 establishes the type of cultivation equipment to be used on the 62 acre lease (cultivation bags with and without floats and attached in rows to longlines anchored in the mudflats) and prohibits damage or disturbance to eelgrass during the installation or use of that cultivation equipment. Additionally, the conditions established by the California

Fish and Game Commission for the sublease include a prohibition on cutting or disturbing eelgrass. In early 2019, Coastal Commission staff learned that unauthorized cultivation equipment had been placed directly within eelgrass habitat in the sublease area, without benefit of a coastal development permit or amendment. This equipment - up to 265 untethered, plastic mesh oyster cultivation bags measuring approximately six square feet each - was installed by Starbird Mariculture and constituted unpermitted development. Because the presence and placement of the equipment resulted in damage and disturbance to eelgrass - in conflict with the conditions of both the CDP and sublease - Coastal Commission and California Department of Fish and Wildlife (CDFW) staff informed CFOC and Starbird Mariculture that the equipment must be removed.

Coastal Commission also staff informed CFOC and Starbird Mariculture that the removal work required an amendment to CFOC's coastal development permit prior to implementing the removal. Starbird Mariculture instead carried out that removal activity without seeking or obtaining such a CDP amendment.

However, several months later, CFOC submitted this CDP amendment application requesting after-the-fact authorization for the removal of the unpermitted cultivation bags from within eelgrass habitat in its state water bottom lease. Additionally, CFOC also requests in this application after-the-fact approval for the additional collection, removal, and disposal of other aquaculture equipment and marine debris that had been abandoned within its lease area by prior aquaculture operators decades ago. CFOC also proposes to collect and remove three remaining anchored cultivation bag longlines and 20 PVC marker poles from within the sublease area.

Although removing the bags and debris will result in recovery of marine habitat, the removal work itself can result in adverse impacts to marine resources. For example, the removal of roughly 240 untethered plastic mesh oyster bags resulted in disturbance to benthic habitat, including eelgrass.

Along with the mitigation measures associated with the original authorization of CFOC's aquaculture operation (included in CDP 1-93-73), the implementation of new **Special Conditions 4 through 7**, will reduce impacts to marine resources such that the project can be found consistent with the terrestrial and marine resource protection policies of the Coastal Act. **Special Condition 4** would establish a permit term limit to ensure that CFOC's operation continues to be carried out under a valid lease of state tidelands. **Special Condition 5** would prohibit the use of untethered cultivation bags that are particularly susceptible to displacement and loss, and would require any such existing bags to be collected and removed. **Special Condition 6** would require CFOC to develop and submit an annual report to the Executive Director with information about its operation and marine debris reduction and response efforts. **Special Condition 7** would require CFOC to implement a variety of marine debris reduction and response efforts, including participation in clean-up events and staff trainings, as well as by marking its high-volume gear with its company name or other identification.

The Commission staff therefore recommends that the Commission **APPROVE** coastal development permit amendment application 1-93-73-A1, as conditioned.

TABLE OF CONTENTS

I. MOTION AND RESOLUTION	4
II. SPECIAL CONDITIONS	4
III. FINDINGS AND DECLARATIONS.....	6
A. Background and Project Description	6
B. Other Agency Approvals.....	9
C. Marine Resources	10
D. Alleged Violation.....	16
E. California Environmental Quality Act	17

APPENDICES

[Appendix A – Substantive File Documents](#)

EXHIBITS

[Exhibit 1 – Existing Permit Conditions \(from CDP No. 1-93-73\)](#)

[Exhibit 2 - Project Location](#)

[Exhibit 3 - Loose Cultivation Bags in Eelgrass Habitat](#)

[Exhibit 4 - Examples of Abandoned Aquaculture Equipment Removed by CFOC](#)

[Exhibit 5 - Abandoned Aquaculture Barge and Removal by CFOC](#)

[Exhibit 6 - Starbird Mariculture Sublease Area and Eelgrass Habitat](#)

I. MOTION AND RESOLUTION

Motion:

*I move that the Commission **approve** Coastal Development Permit Amendment 1-93-73-A1 subject to the conditions set forth in the staff recommendation specified below.*

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in approval of the permit amendment as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of Commissioners present.

Resolution:

The Commission hereby approves the Coastal Development Permit Amendment for the proposed project and adopts the findings set forth below on grounds that the development as amended and conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act. Approval of the permit amendment complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the amended development on the environment.

II. SPECIAL CONDITIONS

All terms and conditions of Coastal Development Permit 1-93-73 (included in [Exhibit 1](#)) shall remain in full force and effect, and the following Special Conditions 4 through 9 shall be added:

- 4. Permit Term Limit.** This permit shall expire on February 29, 2020. If the term of CFOC's lease (State Water Bottom Lease No. M-430-04) - currently also set to expire on February 29, 2020 - is amended or a new lease is issued by the California Fish and Game Commission, CFOC may submit an application for a permit amendment requesting an extension of the permit term. CFOC shall, no less than 60 days prior to permit expiration or the cessation of its operations on Lease No. M-430-04, submit a complete application to amend this permit to remove all cultivation equipment and accumulations of oyster shell and return the lease area to a natural condition.
- 5. Loose Cultivation Bags.** All mesh shellfish cultivation bags (including "bottom bags" and "floating bags") used on State Water Bottom Lease No. M-430-04 shall be affixed to anchored longlines. No loose or untethered bottom bags shall be placed or maintained on State Water Bottom Lease No. M-430-04, and any loose or untethered cultivation bags found on State Water Bottom Lease No. M-430-04 shall be relocated and reattached to anchored longlines or collected and removed as soon as feasible.

- 6. Annual Report.** By December 31 of each year, CFOC shall submit to the Executive Director an annual report with information regarding the results of quarterly cleanup events carried out as described in **Special Condition 7** and the date of training, training materials, meeting minutes, and list of attendees from the Marine Debris Reduction Training described in **Special Condition 7(C)**. In addition, the annual report shall include information on the number of cultivation bags lost, replaced, and recovered throughout the course of the year as well as any design, management, or operational changes implemented to address issues that have arisen. The annual report shall also include a description of any significant changes to the type, quantity and configuration of cultivation equipment that are being considered and any resource or operational challenges that are emerging.
- 7. Marine Debris Reduction and Management.** CFOC shall carry out operations consistent with the following marine debris reduction and management practices:

 - A. Storm Damage and Debris.** As soon as safely and reasonably possible following storm or severe wind or weather events, CFOC shall patrol all active aquaculture areas for escaped or damaged aquaculture equipment. All equipment that cannot be repaired and placed back into service shall be properly recycled or disposed of at an appropriate onshore facility. In addition, CFOC shall retrieve or repair any escaped or damaged aquaculture equipment that it encounters while conducting routine daily and/or monthly maintenance activities associated with shellfish culture (e.g. bed inspections, shellfish harvest and planting). If the escaped gear cannot be repaired and replaced on the shellfish bed, it shall be properly recycled or disposed of on land.
 - B. Gear Marking.** CFOC shall mark shellfish cultivation bags (bottom bags and floating bags) and floats in an easily identifiable manner with identification information including its company name. Markings shall be securely attached and robust enough to remain attached and legible after an extended period in the marine environment (e.g. heat transfer, hot stamp, etching, etc.). Existing cultivation bags and floats currently in use shall be marked or replaced with marked versions when replanted, and all unmarked gear shall be replaced in this way within 18 months of approval of this permit amendment. In the event that its shellfish culture gear or equipment becomes displaced or dislodged from culture beds, CFOC shall retrieve the material from the shoreline, open water, eelgrass beds, mudflat, or submerged bottom in a manner that will avoid or minimize any damage to marine resources such as eelgrass. Once located, such material shall be removed as soon as feasible and properly disposed of, recycled, or returned to use.
 - C. Marine Debris Reduction Training.** WITHIN 30 DAYS OF ISSUANCE OF THIS PERMIT AMENDMENT, CFOC shall implement an employee training regarding marine debris issues, how to identify culture gear or associated materials (marking stakes, support posts, longlines, etc.) that is loose or at risk of becoming loose, proper gear repair methods and how to completely remove gear from out-of-production areas. Particular focus shall be placed on management and maintenance practices to reduce the loss of any gear type consistently found during bay cleanup and inspection activities. This training shall be repeated on an annual basis throughout the term of the permit. During trainings, CFOC's employees shall be encouraged to consider and implement field and management practices that reduce the amount of small plastic

- gear (such as zip-ties, tags and fasteners) and non-biodegradable material (such as PVC stakes and nylon or polypropylene rope) used in its operations.
- D. Cleanup Events.** CFOC shall carry-out quarterly Tomales Bay cleanup events in coordination with other interested parties or organizations, which shall include walking different portions of the bay and shorelines to pick up escaped shellfish gear and other trash (regardless of whether it is generated by the project). The volume and type of shellfish gear collected and the cleanup location (marked on a map) and duration of cleanup activity shall be recorded and documented in the annual report submitted to the Executive Director of the Commission.
- E. Ongoing Operations.** CFOC shall not leave or temporarily store tools, loose gear, or construction materials on its leased tidelands or surrounding areas. All aquaculture gear installed in active culture areas shall be kept neat and secure and maintained in functional condition. CFOC shall carry out regular bed inspections and maintenance activities to help ensure that broken, collapsed, fallen, or buried gear is fixed or removed in a timely manner.
- F. Bed Cleaning at Harvest.** At the time of harvest of each cultivation area, CFOC shall carry out a thorough inspection to locate and remove loose, abandoned or out of use equipment, tools, and accumulations of oysters from the surrounding substrate. Oyster shell shall not be intentionally placed or deposited within the lease and oysters or oyster shell accidentally spilled during harvest shall be immediately collected and removed.
- G. Excessive Gear Loss or Maintenance Failures.** If the Executive Director determines that CFOC is responsible for consistently extensive loss of aquaculture equipment (including cultivation bags) into the marine environment or is consistently failing to maintain its equipment in an intact and serviceable condition, CFOC shall, within 60 days of the Executive Director's written notification, submit a permit amendment to modify its cultivation equipment and/or operational practices to address the issue.

III. FINDINGS AND DECLARATIONS

A. BACKGROUND AND PROJECT DESCRIPTION

The project area is located offshore of Preston Point and the mouth of Walker Creek on the east side of Tomales Bay, near the community of Marshall in western Marin County ([Exhibit 2](#)). The project area is within State Water Bottom Lease No. M-430-04, a roughly 62 acre area of tidelands leased to the Charles Friend Oyster Company and used for the cultivation of Pacific oysters (*Crassostrea gigas*).

In March 1994, the Coastal Commission granted coastal development permit (CDP) No. 1-93-73) to Bay Bottom Beds, Inc. for shellfish aquaculture development consisting of the placement and operation of several hundred lines of tethered plastic mesh "bottom bags" and "floating bags" on two state aquaculture leases in Tomales Bay (State Water Bottom Lease Nos. M-430-04 and M-430-19). In February 2002, this CDP was transferred by the Commission to two new entities through an assignment of permit action (E-02-007-T1). Charles Friend Oyster Company (CFOC) acquired lease number M-430-04 and Michael Toussaint acquired lease number M-430-19. CDP No. 1-93-73 only authorizes the placement and use of a specific type and configuration

of shellfish culture apparatus (as shown in Exhibits 4-6 of the Commission's adopted findings for CDP No. 1-93-73). Installation and use of other types of equipment or structures in the lease area would require a new CDP or permit amendment.

In May 2012, the California Fish and Game Commission authorized the establishment and issuance to Starbird Mariculture of an approximately 2.8 acre sublease on a portion of State Water Bottom Lease No. M-430-04. In early 2019, Commission staff received reports showing that roughly 265 loose, untethered cultivation bags had been placed throughout the roughly 2.8 acre sublease area, including in areas of eelgrass habitat ([Exhibit 3](#)). The placement of these mesh cultivation bags on and over eelgrass beds resulted in loss and damage to this sensitive habitat due to crushing, burial, shading, and physical displacement. Because CDP No. 1-93-73 prohibits disturbance or damage to eelgrass and does not authorize the use of loose, untethered cultivation bags, the placement of such equipment in eelgrass beds without benefit of a CDP or permit amendment is a Coastal Act violation. Additionally, the placement of this cultivation equipment within eelgrass conflicts with a condition included by the California Fish and Game Commission on the sublease. This condition prohibits eelgrass from being cut or disturbed during aquaculture operations.

To resolve the Coastal Act violation, Commission staff directed CFOC and its sublessee, Starbird Mariculture, to develop a plan for finding, collecting, and removing the unpermitted cultivation equipment from the sublease area and to submit this plan for Commission consideration as part of a CDP or permit amendment application. However, Starbird Mariculture proceeded to remove 240 unpermitted cultivation bags from the sublease area in January 2019 without obtaining a permit or permit amendment. Upon learning that Starbird Mariculture did not obtain a permit or permit amendment, Commission staff directed them to seek after-the-fact authorization for the unpermitted development.

Starbird Mariculture has now discontinued its use of the sublease area and both it and CFOC have requested to the California Fish and Game Commission that the sublease be terminated.

To authorize the removal work, CFOC is requesting an after-the-fact amendment to its original CDP from 1994 (this permit was transferred from Bay Bottom Beds to CFOC in 2002 through Assignment of Permit No. E-02-007-T1). Specifically, CFOC is requesting after-the-fact approval for the removal of 240 untethered six-square foot plastic mesh oyster cultivation bags from eelgrass habitat within a roughly 2.8 acre area of State Water Bottom Lease No. M-430-04. In addition, CFOC is also requesting after-the-fact authorization for the collection and removal of an extensive amount of derelict aquaculture equipment that had been abandoned within its lease area decades ago by previous companies and operators. This removal work involved hundreds of hours of labor by CFOC staff to collect and dispose of several hundred plastic mesh cultivation bags and over a thousand pounds of rusted metal cultivation racks, including 64 hours of work in early June 2019 that resulted in the removal of two large boatloads of rusted racks and mesh cultivation bags (as shown in the photographs provided in [Exhibit 4](#)). Although an exact accounting of the number of each type of gear removed by CFOC is not available, anecdotal reports – including descriptions and photographs provided on the online blog <http://coastodian.org> – and summary information provided by CFOC indicate that it has removed

more than 500 abandoned plastic mesh cultivation bags and 100 abandoned metal racks from within and around its lease area.

CFOC is also requesting after-the-fact authorization for its efforts in February 2018 to remove from the bay an approximately 20 foot wide by 40 foot long barge that had sunk after being moored within State Water Bottom Lease No. M-430-04 without benefit of a coastal development permit. Although the circumstances surrounding the initial mooring of this barge and its sinking have not been clearly documented, once it was brought to the attention of CFOC's current management, swift action was taken to remove it.

Finally, CFOC is proposing to remove all remaining aquaculture equipment from the Starbird Mariculture sublease area, including three anchored nylon lines used for cultivation bags and roughly 20 eight foot long PVC marker poles.

Removal Activities

The specific activities involved in the collection and removal of cultivation bags from the sublease area includes the following:

Loose culture bags drifted into eel grass and were removed by boat and gaffing hook, in total 240 bags were in the subtidal zone of the sublease. A crew of 2 on a boat utilizing scuba equipment and working 9 hours spread over several days worked to remove the bags carefully to minimize impact to the eel grass. Gaffing hooks with blunt plastic tips were used to hook the bags and gently pull them to the surface and into the boat. Any marine life and eel grass attached were returned to the area immediately.

The proposed collection and removal of the remaining three nylon cultivation bag anchor lines and PVC marker posts from within the sublease would also be carried out by hand. The anchor lines are held in place through the use of posts that have been pounded in the mud at either end and would be extracted by twisting and pulling with simple hand tools at low tide. The PVC marker posts can be similarly pulled from the mud by hand at low tide. This work would be expected to be completed within one tidal cycle.

Removal of abandoned cultivation bags and metal rack structures from CFOC's larger lease area was also carried out by hand with vessel support and involved only minimal hand tools such as hay-hooks and gaffing hooks used to lift and extract the equipment from intertidal and subtidal areas. CFOC's removal activities have been focused on aquaculture equipment abandoned and exposed on mudflat areas or only partially buried. All of the individual cultivation structures and equipment collected by CFOC have been small enough to be extracted and removed by hand without the need for excavation or mechanized equipment.

Although anecdotal reports indicate that significant amounts of additional abandoned aquaculture equipment remain buried in the mudflats of CFOC's lease and surrounding areas, CFOC's efforts have focused on the opportunistic removal of equipment when it becomes exposed or unearthed due to natural sediment movement and scour. CFOC's small, outboard motor driven skiffs and support vessels have been used to bring staff to areas in which exposed equipment has been identified and to transport collected aquaculture gear and equipment to shore for re-use or

landfill disposal. **Exhibit 4** provides representative photographs of the type and quantity of abandoned aquaculture structures that CFOC has removed, an activity that it is now seeking to authorize, after-the-fact.

Removal of the approximately 800 square foot work barge from the sublease area involved more substantial work due to the barge's size and weight and fact that it had partially sunk and a portion of it was resting on the seafloor prior to removal. In order to successfully remove the barge, CFOC first re-floated it and brought it to the surface through the use of air-inflated "lift bags" and large buoy devices. These floats were attached either by divers or at extreme low tide when much of the barge was above water and could be more easily accessed. Once floating, CFOC used an outboard motor powered vessel to tow it to the nearby Marshall Boat Works where it was removed from the bay and dismantled. Photographs of the lifting and transport process are provided in **Exhibit 5**.

B. OTHER AGENCY APPROVALS

California Fish and Game Commission

Charles Friend Oyster Company's operation is carried out within State Water Bottom Lease No. M-430-04. In February 2018, the California Fish and Game Commission (FGC) extended the term of this lease by one year and, unless renewed, it will terminate on February 29, 2020. This is the third one-year extension issued to CFOC. **Special Condition 4** would establish a permit term that is tied to the term of CFOC's lease. If the lease term is extended, the CDP term could be modified through a permit amendment to reflect the new expiration date.

In addition to issuing the lease to CFOC, the FGC also authorized an approximately 2.8 acre sublease of this area by Starbird Mariculture. However, use of this sublease has been discontinued and Starbird Mariculture has requested that the sublease be terminated. That request is being considered by FGC at this time.

Because the placement of cultivation equipment within eelgrass habitat in the sublease conflicts with the conditions of both the existing CDP for this area and the sublease, Commission staff reached out to and coordinated with staff from the California Department of Fish and Wildlife who are tasked with aquaculture lease management on behalf of FGC.

California Department of Fish and Wildlife

The aquaculture operations of Charles Friend Oyster Company and Starbird Mariculture are required to be registered annually with the California Department of Fish and Wildlife (CDFW) and to adhere to a variety of protocols related to introduced species and the importation of oyster seed. Both companies have valid registrations for 2019. Commission staff reached out to and solicited input from CDFW staff during the course of this permit amendment review, consistent with the state and federal agency coordination process established for shellfish aquaculture projects in Tomales Bay through a Memorandum of Agreement signed in 2016.

Greater Farallones National Marine Sanctuary

Tomales Bay is within the Greater Farallones National Marine Sanctuary and under management by the Office of National Marine Sanctuaries (ONMS). Commission staff coordinated its review

of the proposed project with ONMS staff and solicited input from them, consistent with the state and federal agency coordination process established for shellfish aquaculture projects in Tomales Bay through a Memorandum of Agreement signed in 2016. In addition, ONMS staff provided information to Commission staff about the presence and location of sensitive marine resources in the project area, including eelgrass habitat.

C. MARINE RESOURCES

Section 30230 of the Coastal Act states:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231 of the Coastal Act states:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

CFOC's previously completed and proposed removal work has the potential to result in adverse impacts to marine resources through the disturbance of marine habitat and release of debris into the marine environment.

Habitat Loss and Disturbance

Collection and removal of the 240 cultivation bags, approximately 800 square foot work barge, three nylon anchor lines, and PVC posts from the approximately 2.8 acre Starbird Mariculture sublease area and the collection and removal of over 600 abandoned cultivation bags and racks from the larger 62 acre lease would result in the trampling and minor excavation of soft sediment areas beneath and adjacent to the installation sites of these structures and materials. In total, Commission staff estimates that approximately 1,200 square feet¹ of intertidal and subtidal mudflats and 280 square feet² of eelgrass habitat would be affected to various degrees by this

¹ This area was calculated by assuming a removal disturbance area of two square feet for each cultivation bag and metal rack. These disturbance areas were then multiplied by the approximate number of each type of equipment collected and removed by CFOC and Starbird Mariculture. Removal of the PVC posts and three anchor lines would affect less than five square feet.

² Given the careful removal process that was employed by Starbird Mariculture for cultivation bags within eelgrass beds in the sublease area (which involved the use a divers and a gaffing hook from a vessel at high tides when

disturbance, adversely affecting the eelgrass, invertebrate species and benthic communities that populate this area.

Mudflats

Research has shown that on mudflats, the mechanical disturbance of sediments caused by trampling can cause surface dwelling animals to become buried and burrowing animals to be pulled to the surface, often resulting in their injury or death (Rossi et al. 2007). Footsteps can also damage and displace the algal biofilm that develops on the surface of mudflats (Stal and de Brouwer 2003) and destroy animal burrows. This disturbs the cohesion of sediment particles, leading to increased turbidity, sedimentation, and erosion, and can also change the strength of biological interactions and affect other organisms throughout the benthic community (Peterson 1977; Wynberg and Branch 1997; Stal and de Brouwer 2003; Contessa and Bird 2004 and references therein). Trampling can also alter the topographic complexity of mudflats, which can affect the recruitment and spatial distribution of microalgae (Wynberg and Branch 1994) and larger organisms (Rossi and Chapman 2003; Cruz-Motta et al. 2003). In addition, the compaction of sediments caused by trampling may also alter the transfer of nutrients and oxygen between the sediment and the overlying water and change sedimentation rates, thus additionally modifying the population dynamics and distribution of animals in the mudflat community (Contessa and Bird 2004). A study on the effects of consistent trampling carried out by Rossi et al. (2007) indicates that it can also change the age class and relative abundance of shellfish species living within affected mudflats (which may have wider ecological consequences by shifting the balance between suspension feeding and deposit feeding organisms). Although they did not specifically measure the time needed for disturbed mudflats to recover, the research by Rossi et al. (2007) suggests that a variety of the physical and ecological effects of trampling and mudflat disturbance may persist beyond the short-term (days and weeks).

Although these impacts to benthic species and mudflat habitats may have significant effects on overall marine species populations or productivity if they occur over a long period of time, on a large spatial scale, or affect a large percentage of the mudflats in an area, the proposed project is short-term and restricted to a small area of mudflats surrounded by hundreds of acres of similar habitat. In addition, CFOC's exclusive use of hand labor and hand tools to extract the cultivation bags and abandoned aquaculture equipment would minimize the disturbance footprint of these activities. CFOC's use of a support vessel to remove the material at high tide would also minimize mudflat disturbance by facilitating direct water access to the work sites and limiting the need to create and use long access trails. Further, removal of the unpermitted structures from mudflat habitat would allow the areas underlying these structures to recover from any ongoing negative effects associated with their presence (such as physical displacement, scouring, accumulation of debris, entrapment and interference with animal movement, alteration of current flows, and interference with the direct connection between deeper sediments, the sediment surface and overlying water). Although the removal activity would result in adverse impacts to marine wildlife and habitats, these impacts would have a short duration. Over the mid- to long-term, the removal of this equipment would provide a significantly greater benefit.

passage over the eelgrass was possible), the disturbance estimate for each of the 240 bags is reduced to one square foot. This total area is combined was the estimated 40 square feet of disturbance to eelgrass habitat that resulted from the lifting and removal of the partially sunken barge.

Based on a photo review of the structures by Commission staff (including those shown in **Exhibit 3**), the approximate total footprint of the approximately 500 abandoned cultivation bags and 100 abandoned metal racks on the mudflats was 4,600 square feet³. Therefore, the short-term disturbance of roughly 1,200 square feet of mudflat habitat would facilitate the long-term recovery of roughly four times as much similar habitat, which provides a significant net benefit.

These mid- to long-term net benefits to marine wildlife and habitat have been one of CFOC's primary motivations in carrying out the removal of derelict and abandoned aquaculture gear from its lease area.

Eelgrass

While the majority of CFOC's removal activities were carried out in areas with unvegetated subtidal channels and mudflats, those within the Starbird Mariculture sublease occurred in eelgrass habitat. As shown in **Exhibit 6**, based on eelgrass habitat mapping carried out on behalf of the Greater Farallones National Marine Sanctuary in 2017, eelgrass extends across nearly the entire sublease area. As such, the lifting and removal of the partially sunken barge and collection and removal of the 240 untethered cultivation bags involved activities in, on, and over eelgrass habitat.

While these activities were predominantly carried out at higher tides using vessels in submerged areas that allowed work to proceed from the surface of the water without contacting or disturbing the eelgrass growing on the seafloor below, some contact with the bottom still occurred as a result of searching for cultivation bags or hooking and pulling them free. Additionally, because the 800 square foot barge had been moored within the center of an eelgrass bed and had partially sunk there, its re-floating and removal involved contact and disturbance of eelgrass habitat around its perimeter. Based on a conservative estimate that removal of each cultivation bag disturbed one square foot of adjacent eelgrass habitat and that floating and removal of the barge affected eelgrass habitat along its entire 40 foot length, the total amount of eelgrass habitat disturbed or damaged as a result of the removal activities carried out in the sublease area would be 280 square feet.

Within this 280 square foot area, eelgrass would be trampled, buried, dislodged, and uprooted. The effect of this disturbance on the productivity and persistence of the eelgrass beds with the sublease area heavily depends on its severity and spatial extent. Because eelgrass beds typically include extensive underground networks of roots and rhizomes, limited removal or damage to the eelgrass blades exposed aboveground can often be overcome fairly quickly and without significant long-term consequences to the overall productivity or stability of the eelgrass bed. In other words, if a small area of eelgrass plants is damaged within a large, healthy, high density bed, the bed can recover quickly. This concept is often relied upon for eelgrass restoration projects that rely on the collection of a limited number eelgrass plants from healthy "donor populations" that can then be replanted within a restoration site.

³ Assuming an average area of six square feet for each of the approximately 500 cultivation bags and 16 square feet for each of the 100 cultivation racks, the total footprint of this abandoned equipment would be 4600 sq. ft.

The disturbance associated with the removal of the 240 individual cultivation bags appears to be within the larger surrounding eelgrass bed's ability to quickly recover from. Most of these small, individual disturbances were dispersed across the eelgrass beds covering the approximately 2.8 acre sublease area and therefore appear to have resulted in limited overall adverse impacts. Additionally, because the bag removal activity was carried out during the winter months when eelgrass is more dormant and the size of beds can retract, it may have been affected less severely. The cultivation bags were likely easier to locate and hook onto from the surface vessel and there was less exposed eelgrass available to be damaged. A comparison of aerial photographs taken during the winter months when the cultivation bags were still present throughout the eelgrass beds with those taken more recently during the eelgrass growing season appears to indicate that there is little obvious remaining evidence of disturbance from bag removal activities.

However, numerous rectangular shaped bare areas and openings within the eelgrass bed do appear to be present and may represent the lingering effects of eelgrass damage and loss caused by the initial placement and presence of the cultivation bags themselves. While Starbird Mariculture alleges that its cultivation bags were only in place within the eelgrass habitat for a short period as a result of an unexpected confluence of high winds and strong tidal currents in early 2019 and were removed before any lasting damage to eelgrass habitat occurred, this information has been difficult to independently corroborate or verify. In some cases, it is also directly contradicted by information and photographs provided to Commission and CDFW staff. For example, in early 2018 – one year prior to the event that prompted Starbird Mariculture to remove its 240 cultivation bags – Commission and CDFW staff were provided information also showing a large number of loose, untethered cultivation bags within eelgrass beds throughout the sublease area.

Regardless of how long it has been occurring, to help ensure that this situation doesn't arise again and to prevent the future movement of cultivation bags into eelgrass beds and other sensitive areas in the future, **Special Condition 5** would require all cultivation bags used on CFOC's lease area to be affixed to anchored lines. **Special Condition 5** would also require all loose or untethered cultivation bags to be collected and removed or reattached as soon as feasible. In addition to addressing one of the factors that led to the presence of Starbird Mariculture's cultivation equipment within eelgrass beds – its use of loose, untethered bags that were susceptible to displacement and unintended movement – this condition would also help ensure the recovery of any of Starbird Mariculture's cultivation bags that remain lost in the bay.

Special Conditions 6 and 7 would also provide additional protection against the loss or movement of aquaculture equipment into sensitive habitat areas such as eelgrass beds. **Special Condition 7** would require CFOC to develop and implement a marine debris reduction and management plan that would include prompt responses to storm events so that lost or damaged gear can be recovered quickly before dispersing outside the bay or into sensitive areas. The marine debris reduction and management plan would also include a requirement for cultivation gear – including cultivation bags – to be marked in an identifiable manner with the CFOC's name. This would provide additional incentive for CFOC to properly maintain and retain its equipment as well as increase the likelihood that lost gear can be returned to them and they can assist in its retrieval. Further, **Special Condition 7** would also establish maintenance and operations best management practices focused on reducing gear loss and marine debris as well as

memorialize CFOC's commitment to continuing to participate in cleanup events throughout Tomales Bay. **Special Condition 6** would provide a consistent opportunity and mechanism to evaluate CFOC's compliance in implementing the marine debris reduction and management measures established through **Special Condition 7** by requiring an annual report. This report would include information regarding the results of quarterly cleanup events as well as information on the number of cultivation bags lost, replaced, and recovered throughout the course of the year as well as any design, management, or operational changes implemented to address issues that have arisen.

Moving forward, **Special Conditions 5-7** would significantly reduce the likelihood and magnitude of the gear loss and displacement that has been shown on CFOC's lease in recent years and help prevent the need for future large-scale gear removal and recovery efforts similar to those included in this permit amendment application.

These conditions would also help address the adverse impacts that resulted from the past loss and abandonment of gear on CFOC's lease. The scale of these impacts – particularly those associated with Starbird Mariculture's operations - is difficult to precisely assess because Starbird Mariculture's cultivation bags were removed before they could be more closely evaluated and impacts to eelgrass measured. While one could calculate the total area occupied by the 240 cultivation bags that Starbird Mariculture recovered from its sublease and use that area to estimate a worst-case impact (approximately 1,440 square feet), such an approach would likely result in an over-estimation. Available imagery shows many bags resting in piles wholly or partially on other bags or located outside of the sublease on mudflats or in other areas without visible eelgrass. This would reduce the total impact area below the worst case estimate.

Although the exact scale of the adverse impact to eelgrass from Starbird Mariculture's operations is not clear, recognizing that it is both the primary lease and permit holder for the larger area, CFOC has acted to help compensate for those impacts. As discussed above, this has been through its consistent efforts – including those recently in June 2019 – to remove abandoned and derelict aquaculture gear from areas of mudflats and eelgrass habitat. During its most recent effort, CFOC staff spent approximately 64 hours collecting and removing several hundred pounds of rusting metal cultivation racks and plastic mesh bags that had been abandoned within its lease many decades before. These materials are present throughout the extensive mudflats at the mouth of Walker Creek and are periodically exposed and re-buried due to movement of the creek and currents across the mudflats. By acting quickly to remove the abandoned gear while it is exposed, CFOC not only helped enhance the surrounding mudflat habitat but also helped prevent the movement and displacement of the gear into more sensitive areas such as the surrounding eelgrass beds. Implementation of the protective measures and requirements of **Special Conditions 5-7** would build on these benefits by further helping protect eelgrass and other sensitive habitats from being subject to adverse impacts in the future – impacts caused by the presence of lost and derelict cultivation equipment such as such as habitat disturbance, damage and displacement.

Although it also resulted in some disturbance to eelgrass habitat, CFOC's lifting and removal of the sunken barge from its lease is also expected to provide a long-term benefit to eelgrass habitat. The habitat disturbance occurred during and as a result of the re-floating and removal of the 800

square foot barge. As shown in [Exhibit 5](#), the barge sank within a large eelgrass bed and was therefore surrounded by eelgrass habitat. Although carried out carefully by marine salvage contractors hired by CFOC, any slight displacement of the barge during the re-floating process, anchoring of the salvage vessel, or contact with the seafloor by salvage divers or equipment during the removal process would have resulted in damage and disturbance to eelgrass habitat. Although pre- and post-removal surveys were not carried out and it is therefore not possible to accurately measure the extent of eelgrass loss or damage caused during the barge removal process, based on the fact that the barge was resting on the seafloor along its 40 foot long edge, a minimum estimate for this disturbance area would be 40 square feet.

Because the barge was removed, however, this area of disturbance would be expected to recover also with the much larger surrounding area from which eelgrass was displaced due to crushing and shading from the barge. Based on information from aerial photographs, this larger area in which eelgrass is expected to recover likely matches or slightly exceeds the 800 square foot area of the barge. Therefore, although removal of the barge resulted in some limited adverse impacts to eelgrass habitat, its absence would allow the recovery of eelgrass into a significantly larger area.

Marine Debris

Man-made material released into the marine environment, especially plastics, pose a significant threat to both marine wildlife and habitats. This debris may cause injury and death to marine life by entanglement or ingestion and can negatively affect habitats through spatial displacement and mechanical disturbance. Because the cultivation bags placed within the sublease area by Starbird Mariculture are primarily comprised of plastics, their continuing presence in Tomales Bay increases the risk of plastic materials becoming loose, breaking apart, dispersing, and becoming marine debris. While Starbird Mariculture and CFOC have indicated to Commission staff that 240 of these bags have been removed, because this removal activity was carried out without benefit of a CDP or permit amendment and the associated oversight provided through that process, it remains unclear if all of the loose, untethered cultivation bags were successfully removed or if others remain in the bay as marine debris. Although only a rough estimate, the initial assessment of the number of loose cultivation bags placed by Starbird Mariculture was 265. The removal of only 240 cultivation bags by Starbird Mariculture therefore indicates that up to 25 additional cultivation bags may still remain within the sublease area or Tomales Bay. To address this risk and ensure that complete clean-up and removal of the unpermitted cultivation equipment is accomplished, the Commission is requiring in **Special Condition 5** that any loose or untethered cultivation bags found on State Water Bottom Lease No. M-430-04 shall be relocated and reattached to anchored lines or collected and removed as soon as feasible. This requirement would help ensure the expeditious removal of any cultivation bags that Starbird Mariculture may have missed during its removal efforts.

To additionally address the issue of incomplete removal of the unpermitted development, **Special Conditions 6 and 7** would further establish marine debris prevention and response measures and best management practices. These measures, including quarterly clean-up events and lease area inspections would increase the likelihood that any unpermitted cultivation bags remaining from Starbird Mariculture's operations on its sublease are located and removed. Additionally, the best management practices provided through **Special Condition 7** - including

those focused on inspections following storm events; debris reduction trainings for field employees; quarterly cleanup events; gear marking; field storage of tools and construction materials; and comprehensive debris cleaning and removal activities be carried out on each bed at the time of its harvest - would reduce the long-term accumulation of debris within cultivation beds, prevent debris generation and loss, and promote recovery for materials lost due to storm action or other unavoidable causes. The annual reporting provided through **Special Condition 6** would provide a mechanism for the results of the clean-up events to be provided to the Commission and allow CFOC to report if/when the up to 25 remaining cultivation bags from Starbird Mariculture's operations are recovered.

Conclusion

Although the proposed project has the potential to adversely impact marine resources and the biological productivity of coastal waters in the short term, with implementation of **Special Conditions 5** through **7**, the project would be carried out in a manner in which marine resources are maintained, species of special biological significance are given special protection, the biological productivity of coastal waters is sustained, and healthy populations of all species of marine organisms will be maintained. In addition, the proposed project, as conditioned, is expected to maintain the biological productivity of coastal waters appropriate to maintain optimum populations of marine organisms. The overall cleanup efforts are also expected to not just maintain marine resources and the biological productivity and the quality of coastal waters, but also to restore them, as called for in Coastal Act Sections 30230 and 30231. The Commission therefore finds that the proposed project, as conditioned, is consistent with the marine resource sections (Sections 30230 and 30231) of the Coastal Act.

D. ALLEGED VIOLATION

As noted above in the Summary, violations of the Coastal Act exist on the subject property, including, but not limited to, installation of unauthorized cultivation equipment such as untethered cultivation bags and disturbance and damage to eelgrass during aquaculture operations. In response to notification by Commission permitting and enforcement staff about these Coastal Act violations, CFOC submitted this CDP amendment application. Approval of this amendment application pursuant to the staff recommendation, issuance of the amended permit, and the applicant's subsequent compliance with all terms and conditions of the permit results in resolution of the future impacts from the violation related to the unpermitted removal of the unauthorized cultivation equipment [going forward].

Although development has taken place prior to the submission of this Coastal Development Permit amendment application, consideration of this application by the Commission has been based solely upon the Chapter 3 policies of the Coastal Act. Commission review and action on this permit amendment does not constitute a waiver of any legal action with regard to the alleged violation related to the installation of unauthorized cultivation equipment - or any other violations at the site, nor does it constitute an implied statement of the Commission's position regarding the legality of development, other than the development addressed herein, undertaken on the subject site without a coastal permit or permit amendment. In fact, approval of this permit amendment is possible only because of the conditions included herein and failure to comply with these conditions would also constitute a violation of this permit amendment and of the Coastal Act. Accordingly, the applicant remains subject to enforcement action just as it was prior to this

permit amendment approval for engaging in unpermitted development, unless and until the conditions of approval included in this permit amendment are satisfied.

Failure to comply with the terms and conditions of this permit amendment may result in the institution of enforcement action under the provisions of Chapter 9 of the Coastal Act. Only as conditioned is the proposed development consistent with the Coastal Act.

E. CALIFORNIA ENVIRONMENTAL QUALITY ACT

Section 13096 of the Commission's administrative regulations requires Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, to be consistent with any applicable requirements of the California Environmental Quality Act ("CEQA"). Section 21080.5(d)(2)(A) of CEQA prohibits approval of a proposed development if there are feasible alternatives or feasible mitigation measures available that would substantially lessen any significant impacts that the activity may have on the environment. The project as conditioned herein incorporates measures necessary to avoid any significant environmental effects under the Coastal Act, and there are no less environmentally damaging feasible alternatives or mitigation measures. Therefore, the proposed project is consistent with CEQA.

Appendix A: Substantive File Documents

Coastal Development Permits and Application Materials:

Coastal Development Permit No. 1-93-73 and associated file.

Coastal Development Permit Amendment Application No. 1-93-73-A1 and associated file.

Scientific Publications:

Bouchet VM1, Sauriau PG, 2008. Influence of oyster culture practices and environmental conditions on the ecological status of intertidal mudflats in the Pertuis Charentais (SW France): a multi-index approach. *Marine Pollution Bulletin*, 56(11):1898-912.

Contessa L, Bird FL, 2004. The impact of bait-pumping on populations of the ghost shrimp *Trypaea australiensis* Dana (Decapoda: Callinassidae) and the sediment environment. *Journal of Experimental Marine Biology and Ecology* 304:75–97

Crawford, C.M., Macleod, C.K.A., Mitchell, I., 2003. Effects of shellfish farming on the benthic environment. *Aquaculture* 224, 117–140.

Cruz-Motta JJ, Underwood AJ, Chapman MG, Rossi F, 2003. Benthic assemblages in sediments associated with intertidal boulder-fields. *Journal of Experimental Marine Biology and Ecology* 285:383–401

De Grave, S., Moore, S.J., Burnell, G., 1998. Changes in benthic macrofauna associated with intertidal oyster, *Crassostrea gigas* (Thunberg) culture. *Journal of Shellfish Research* 17, 1137–1142.

Drake, P., Arias, A.M., 1997. The effects of aquaculture practices on the benthic macroinvertebrate community of a lagoon system in the Bay of Cadiz (Southwestern Spain). *Estuaries* 20, 677–688.

Forrest, B.M., Creese, R.G., 2006. Benthic impacts of intertidal oyster culture, with consideration of taxonomic sufficiency. *Environmental Monitoring and Assessment* 112, 159–176.

Gouletquer, P., Héral, M., 1997. Marine molluscan production trends in France: from fisheries to aquaculture. In: MacKenzie, C.L., Burrell, V.G., Rosenfield, A., Hobart, W. (Eds.), *The History, Present Condition, and Future of the Molluscan Fisheries of North America and Europe*. NOAA Technical Report NMFS 129, Department of Commerce, Seattle, Washington, pp. 137–164.

Gouletquer, P., Le Moine, O., 2002. Shellfish farming and coastal zone management (CZM) development in the Marennes-Oleron Bay and Charentais Sounds (Charente-Maritime, France): a review of recent development. *Aquaculture International* 10, 507–525.

Kaiser, M.J., 2001. Ecological effects of shellfish cultivation. In: Black, K.D. (Ed.), *Environmental Impacts of Aquaculture*. Sheffield Academic Press, Sheffield, pp. 51–75.

Mitchell, I.M., 2006. In situ biodeposition rates of Pacific oysters (*Crassostrea gigas*) on a marine farm in Southern Tasmania (Australia). *Aquaculture* 257, 194–203.

Mojica, R. and Nelson, W., 1993. Environmental effects of hard clam (*Mercenaria mercenaria*) aquaculture in the Indian River Lagoon, Florida. *Aquaculture*, **113** 313-329.

Nugues, M.M., Kaiser, M.J., Spencer, B.E., Edwards, D.B., 1996. Benthic community changes associated with intertidal oyster cultivation. *Aquaculture Research* 27, 913–924.

Peterson CH, 1977. Competitive organization of soft-bottom macrobenthic communities of Southern-California lagoons. *Marine Biology* 43:343–359

Reed BJ, Hovel KA, 2006. Seagrass habitat disturbance: how loss and fragmentation of eelgrass *Zostera marina* influences epifaunal abundance and diversity. *Marine Ecology Progress Series* 326:133-143.

Rossi F, Chapman MG, 2003. Influence of sediment on burrowing by the soldier crab *Mictyris longicarpus* Latreille. *Journal of Experimental Marine Biology and Ecology* 289:181–195

Rossi F, Forster RM, Monterrat F, Ponti M, Terlizzi A, Ysebaert T, Middelburg JJ, 2007. Human trampling as short-term disturbance on intertidal mudflats: effects on macrofauna biodiversity and population dynamics of bivalves. *Marine Biology* 151:2077–2090

Spencer, B.E., Kaiser, M.J. and Edwards, D.B., 1996. The effects of Manila clam cultivation on an intertidal benthic community: the early cultivation phase. *Aquaculture Research*, **27** 261-276.

Spencer, B.E., Kaiser, M.J. and Edwards, D.B., 1997. Ecological effects of intertidal Manila clam cultivation: observations at the end of the cultivation phase. *Aquaculture Research*, **34** 444-452.

Spencer, B.E., Kaiser, M.J. and Edwards, D.B., 1998. Intertidal clam harvesting: benthic community change and recovery. *Aquaculture Research*, **29** 429-437.

Stal LJ and de Brouwer JF, 2003. Biofilm formation by benthic diatoms and their influence on the stabilization of intertidal mudflat. In J.Rullkötter (Ed.), *BioGeoChemistry of tidal flats*. Proceedings of a workshop at the Hanse Institute of Advanced Study, May 14–17, Delmenhorst, Germany (pp.109–111). Wilhelmshaven: Forschungszentrum Terramare

Wynberg RP, Branch GM, 1994. Disturbance associated with bait collection for Sandprawns (*Callinassa kraussi*) and Mudprawns (*Upogebia africana*). Long-term effects on the biota of intertidal sandflats. *Journal of Marine Research* 52:523–558

Wynberg RP, Branch GM, 1997. Trampling associated with bait collection for sandprawns *Callinassa kraussi* Stebbing: effects on the biota of an intertidal sandflat. *Environmental Conservation* 24:139–148