

CALIFORNIA COASTAL COMMISSION

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W16a

January 7, 2014

TO: Coastal Commissioners and Interested Parties

FROM: Cassidy Teufel, Environmental Scientist

SUBJECT: Addendum to Staff Report for Consistency Certification CC-035-12, KZO Sea Farms

This addendum provides revisions to the December 20, 2013 staff report on KZO Sea Farms' proposal to install and operate a 100-acre shellfish aquaculture facility offshore of Long Beach.

REVISIONS

SECTION I – MOTION AND RESOLUTION

Since publication of the staff report, KZO Sea Farms has modified the project to incorporate all of the conditions described on pages three through seven of the staff report (Conditions 1-12). Additionally, in response to comments submitted on January 6, 2014, by the California Department of Fish and Wildlife, Orange County Coastkeeper, Ocean Defenders Alliance, and Heal the Bay, the Commission staff is recommending modifications to Conditions 2 and 13, as described below. On January 6, 2014, KZO agreed to implement modified Condition 2 and add Condition 13 and incorporate them into its project description. With these elements now included in the project description, the Commission staff is recommending concurrence with the consistency certification rather than conditional concurrence – as reflected in the modified motion and resolution included below.

Motion:

*I move that the Commission **conditionally concur** with KZO Sea Farms' consistency certification CC-035-12 that, ~~if modified in accordance with the following conditions,~~ the project described therein would be consistent with the enforceable policies of the California Coastal Management Program and would be conducted in a manner consistent with that program.*

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in a ~~conditional~~ concurrence with the proposed project and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution:

*The Commission hereby **conditionally concurs** with the consistency certification by KZO Sea Farms on the grounds that, ~~if modified in accordance with the following conditions,~~ the project described herein would be consistent with the enforceable policies of the California Coastal Management Program and would be conducted in a manner consistent with that program.*

SECTION III – FINDINGS AND DECLARATIONS

Throughout Report:

In the conclusion of each section and subsection of the report's findings, all references to "the Commission adopts" particular conditions should be changed to "KZO will implement the actions described in" that particular condition. In addition, all statements of the following "With the implementation of the conditions described above" should be deleted.

SECTION II – CONDITIONS

Condition 1:

(k) that monitoring include an evaluation of water quality and current speed and direction at and around the facility...

Condition 2:

Marine Wildlife Mammal Entanglement. No less than once per month, KZO shall visually inspect all ropes, cables, and equipment to determine if any entanglement of marine wildlife ~~a marine mammal~~ has occurred and to ensure that: (a) no lines have been broken, lost or removed; (b) all longlines, anchor lines, and buoy lines remain taught and in good working condition; and (c) any derelict fishing gear or marine debris that collects on the facility is removed and disposed of at an appropriate onshore facility.

Inspections shall include video monitoring of anchors and attached lines, and SCUBA and video monitoring of longlines and mussel and oyster cultivation lines and equipment. Any wear or fatigue of materials shall be remedied immediately ~~as soon as feasible~~. All incidents of observed marine mammal entanglement shall be immediately reported to the National Marine Fisheries Service's Regional Stranding Coordinator (Sarah Wilkins: (562) 980-3230) ~~and Commission staff~~. All incidents of observed marine wildlife entanglement (including sharks, sea turtles, seabirds or marine mammals) shall be immediately reported to

Commission staff. All incidents of potential entanglement (including dislodged, broken, or missing ropes, equipment, or gear) shall be detailed in a written letter and submitted to Commission staff within two days of their occurrence. Survey videos shall be submitted to Commission staff on a quarterly basis.

Condition 13:

Invasive Species. PRIOR TO COMMENCEMENT OF CONSTRUCTION, KZO shall submit for Executive Director review and approval a Hazard Analysis and Critical Control Point (HAACP) plan that details all measures that would be implemented to detect and control aquatic invasive species and pathogens at the facility. The HAACP plan shall include methods to prevent the introduction of aquatic invasive species into the facility and operational practices that prevent the spread of aquatic invasive species within and outside the facility.

SECTION III.A – PROJECT DESCRIPTION

Page 7, end of first paragraph:

This grid of lines would support hanging ropes seeded with Mediterranean mussels (*Mytilus galloprovincialis*) and hanging nets containing Pacific oysters (*Crassostrea gigas*), Olympia oysters (*Ostrea lurida*), and rock scallops (~~*Hinnites mylirugosus*~~ *Crassodoma gigantea*).

Page 8, first full sentence:

In addition, an approximately one-foot diameter helical screw anchor would be embedded in the seafloor at each end of the longlines and a U.S. Coast Guard approved lighted surface buoy would be attached to each corner anchor with an approximately 160-foot length of rope.

SECTION III.F – MARINE RESOURCES

Page 33, end of final paragraph:

In addition, KZO has agreed to implement **Condition 13**, which requires the implementation of a Hazard Analysis and Critical Control Point plan that details all measures that would be implemented to detect and control aquatic invasive species and pathogens at the facility. This measure, too, will reduce the possibility that the proposed project will contribute to the further spread of invasive species in the vicinity of the proposed project.

Marine Protected Areas

Comment letters received by Commission staff on January 6, 2013, from Orange County Coastkeeper, Los Angeles Waterkeeper, and Ocean Defenders Alliance raised concerns about potential adverse impacts to marine biological resources in marine protected areas

throughout the project area from the proposed cultivation of non-native shellfish. These letters note that reproductive material from the cultivated shellfish would be released into the open ocean and may pass into marine protected areas, thus potentially contributing to the establishment of non-native species populations in these areas. As discussed on pages 31 and 32 of the staff report above, the primary non-native species proposed to be cultivated (the Mediterranean mussel) at the proposed facility has been present and highly abundant outside of cultivation throughout southern California for many years. Due to the period of time this species has been established and its current abundance in southern California, it is highly likely that it is already present in high numbers within all of the marine protected areas in the region. In addition, the location of the proposed project – approximately eight miles offshore – places it a substantial distance from the nearest marine protected areas. Specifically, the proposed project site is approximately eight miles from the Bolsa Chica Basin State Marine Conservation Area and nearly 15 miles from the Abalone Cove and Crystal Cove State Marine Conservation Areas – the three closest marine protected areas. Although Mediterranean mussel larvae can drift for several weeks before settling and would therefore be capable of being transmitted from the aquaculture facility to one of these marine protected areas, the distance and time spent in the water column would likely reduce the number of larvae transmitted in this way to levels that would not contribute to the further augmentation of existing populations.

Nevertheless, due to the large numbers of Mediterranean mussels that are proposed to be grown, KZO has committed to implement the actions described in **Condition 1**. Specifically, KZO will develop and submit for Executive Director review and approval a Revised Offshore Mariculture Monitoring Program that includes monitoring and evaluation of the production of eggs and larvae from the cultivated non-native species, the regional dispersion of this reproductive material, and its contribution to the regional presence, persistence, and expansion of populations of these non-native species outside of cultivation. KZO will submit the results of these efforts to the Commission on an annual basis for the first five years of the facility's operation, and if they indicate that the release of reproductive material from the Mediterranean mussels at the project site are having unanticipated effects, including effects on marine protected areas, KZO will implement adaptive management strategies, project modifications, or operational changes to address these effects.



November 1, 2013

Cassidy Teufel
California Coastal Commission
Energy, Ocean Resources and
Federal Consistency Division
45 Fremont Street, Suite 2000
San Francisco, California 94105

Dear Mr. Teufel:

I am writing in support of the Catalina Sea Ranch's mussel farm near Long Beach, California. Once in operation, this venture will be the first working open ocean shellfish ranch in U.S. Federal waters. I ask for the Commission's favorable response to this innovation in the commercial seafood business.

The National Fisheries Institute (NFI) represents member companies in all stages of the seafood value chain. Our member companies provide hundreds of millions of wholesome and nutritious meals to American families each year. NFI's members support the sustainable production of wild-caught and farm-raised seafood that can help meet demand for a protein that, according to the U.S. Dietary Guidelines for Americans, consumers should be eating in significantly greater amounts.

The Catalina Sea Ranch aquaculture mussels project would have a number of benefits. It would create a sustainable source of shellfish without negatively impacting the local environment. It would improve local water quality. It would create jobs in the Long Beach area. And the project would help meet the growing demand for seafood both in the United States and in global markets in a sustainable and environmentally responsible manner. To put this pioneering project into place, a rigorous offshore monitoring program must be implemented. I understand this is underway by leading research institutions specializing in marine science and spatial planning aimed at documenting environmental and social impacts.

This project must of course meet all applicable regulatory requirements now, and once it is up and running. Once those requirements are met, however, the project should be quickly approved so that its many benefits can be realized. NFI asks you to take these views into account as the Commission moves towards approval of this innovative project.

Sincerely,

A handwritten signature in blue ink, which appears to read "Robert A. DeHaan".

Robert DeHaan
Vice President for Government Affairs



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January 7, 2014

California Coastal Commission
45 Fremont Street, Suite 200
San Francisco, CA 94105
Via email: Cassidy.Teufel@coastal.ca.gov

RE: Comments on Consistency Certification CC-035-12 KZO SeaFarms

Dear Chair Kinsey and Coastal Commissioners:

On behalf of Heal the Bay, a non-profit environmental organization with over 15,000 members dedicated to making the Santa Monica Bay and Southern California coastal waters and watersheds safe and healthy for people and local ecosystems, we are writing to provide comments on the Consistency Certification CC-035-12 for KZO SeaFarms. We have reviewed the staff report describing the offshore shellfish project and respectfully submit the following comments.

With California's coastal economy valued at \$43 billion dollars¹, the protection and stewardship of California's coastal resources should be among our state government's most important long-term responsibilities. The proposed KZO SeaFarms operation would be the first permitted offshore aquaculture project to exist off the coast of California, and if successful, the project proponent would like to increase the size and scale of operations in the future. Given the precedent setting nature of this project, it is imperative that the Commission carefully consider the proposed consistency determination, as it could set the stage for how future offshore aquaculture is addressed in California.

We appreciate the Coastal Commission staff's hard work on this project, and we share some of the same concerns outlined in the staff report. Although the conditions are designed to address concerns about threats to marine resources, we continue to have some concerns related to the invasive nature of some of the species proposed to be grown at this facility, as well as the monitoring and entanglement provisions.

Invasive Species Impacts Should be Reduced by Eliminating Pacific Oysters

We appreciate Coastal Commission staff's thorough analysis of potential threats associated with farming non-native Mediterranean Mussels at this location, and understand that staff is not concerned about negative ecological impacts, as this species was introduced to California many decades ago and is now the predominant coastal mussel between Tomales Bay and San Diego. However, we are concerned about the proposed project's inclusion of non-native Pacific Oysters for cultivation. Although it will represent a small proportion of the overall aquaculture operation, this species has invasive potential along the Southern California coast. Including it in the operation could threaten local habitats, as has been demonstrated in San Diego where it was cultured in

¹ National Ocean Economics Program, California's Ocean Economy, Report to the California Resources Agency. 2005. http://resources.ca.gov/press_documents/CA_Ocean_Econ_Report.pdf (accessed Jan 6, 2014)



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northern parts of the County and since has colonized San Diego Bay, Mission Bay, Agua Hedionda Lagoon, and the Tijuana River Estuary.²

Pacific Oysters do not appear to have invaded areas in Los Angeles, but is it worth the risk to include it as a small part of this operation? There is no assurance that Pacific Oysters will not spread from the proposed operation, and although the staff report includes monitoring provisions, if Pacific Oysters are detected in nearby habitats, it may be too late to curb the spread of this non-native species. We urge the Commission to amend the conditions to disallow growing of Pacific Oysters as part of this facility. With native Olympia Oyster restoration activities already occurring in Southern California, we recommend consideration of this species as an alternative, or simply keeping the operation limited to Mediterranean Mussels.

Wildlife Entanglement Provisions Should Include Additional Species

We agree with Coastal Commission staff assessment that marine life entanglement in the proposed project structure is a substantial risk, and support the inclusion of a special condition addressing this concern. However, the staff report focuses on marine mammal entanglement. Additional species, such as leatherback sea turtles, sharks, and seabirds are also at risk of entanglement in the project structure. Therefore, we recommend that additional wildlife species, such as sea turtles, sharks, and sea birds are included in entanglement minimization measures, facility inspections, and video monitoring. Los Angeles communities have invested significant time and resources into marine life and habitat conservation in the area, including sea bird breeding habitat restoration on the nearby Channel Islands as well as the recent establishment of marine protected areas off of Palos Verdes Shelf and Orange County. Potential entanglement issues should not be taken lightly, as it has been documented by Stellwagen Bank National Marine Sanctuary's Marine Mammal Entanglement Working Group and NOAA that nearshore and open ocean aquaculture facilities, particularly those containing ropes and lines can present a risk to marine mammals due to entanglement. As the staff report correctly identifies, "Gray whales off the coast of California are also frequently observed entangled in long lines, ropes, and other gear. In fact, gray whales have the highest reported number of entanglements and ship strikes of any large whale species along the west coast of the U.S. (DeAngelis et al. 2012)."³ Gray whales, humpback whales, pinnipeds, several shark species, and sea birds are prevalent in the channel between Long Beach and Catalina Island, in the vicinity of the proposed project.

Furthermore, we urge the Coastal Commission to strengthen elements within entanglement mitigation conditions. Specifically, we suggest more frequent visual inspections of the facility, rather than once a month. Monthly inspections would not allow for the rescue of any entangled marine life, and it could potentially result in a situation where entangled animals are not detected, as they may become dislodged by currents, wave action, or predators before observation. Additionally, between visual inspections, video monitoring should be ongoing. We recommend including a requirement for the project proponent to regularly review the videos and submit observation reports to the Coastal Commission, potentially on a quarterly basis. We also recommend amending the language within proposed special condition 3, addressing wildlife entanglement, to state that "any wear or fatigue of materials shall be remedied immediately" instead of "any wear or fatigue of materials shall be remedied as soon as feasible," so that such maintenance is prioritized and does not result in failures that would negatively impact marine life.

² California Sea Grant, Our Ocean: A New Oyster Invades. July 2, 2013: <http://caseagrantnews.org/2013/07/02/a-new-oyster-invades/> (accessed January 6, 2014)

³ California Coastal Commission Staff Report for Consistency Certification: CC-035-12, page 22. <http://documents.coastal.ca.gov/reports/2014/1/W16a-1-2014.pdf> (Accessed January 6, 2014).



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In addition to entanglement concerns, species such as gray whales feed in the benthos in this region. The staff report recognizes that the proposed facility may have some negative impacts to the benthic habitat, including the accumulation of biological material on the seafloor and changes in sediment chemistry. The staff report asserts that it is likely that these impacts will extend several acres beyond the facility footprint. It also recognizes that predicting these impacts has high uncertainty, especially without similar operations in the state to use as a basis. In addition to monitoring the impacts of material deposition from the facility on the benthic community, we recommend also considering impacts to marine life that feed in these sandy habitats, such as gray whales, which migrate annually through this area.

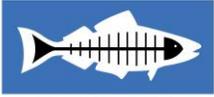
Detailed Monitoring Plan Should be Available for Public Review

We appreciate Coastal Commission staff's inclusion of a monitoring program as a special condition. Since this the first offshore aquaculture facility along California's coast, it is important that robust data is collected to gain a better understanding of impacts, inform adaptive management, and inform potential future offshore aquaculture operations at this site or other locations along the coast. The project proponent plans to scale this operation up to a much larger footprint, therefore the monitoring plan is crucial and should be continued for longer than five years, we recommend that it be continued for the lifespan of the project. The monitoring results should also be reviewed periodically to inform any necessary changes in best practices for the facility.

In addition, we have questions about the monitoring program, such as how frequently will monitoring occur for the various parameters listed (e.g. chemical, biochemical, water quality, ecological, and biological)? How far away from the project site will marine resources be monitored, especially in regards to larval dispersal? Based on ocean currents, what impact will the larvae have on nearby marine protected areas in Orange County, Palos Verdes, and Catalina Island? The offshore location of the proposed facility makes it particularly vulnerable to storm damage from high swells and wave action; therefore we recommend that an additional element be added to the monitoring proposed within special condition 1 to require inspection of the facility within 24 hours of a storm or large wave event and repair of any associated damage.

Moreover, special condition 1 states that the monitoring plan must be developed and certified by the Coastal Commission Executive Director prior to construction of the facility. While we support the development of a more detailed plan, we believe that it imperative that the plan also be made available for public review and comment, especially given the new and precedent setting nature of this project. Furthermore, we request that monitoring reports provided to the Commission should also be provided to the public, so we are kept up-to-date as to the success of this pilot project and associated impacts.

We urge the Commission to carefully consider that the proposed development will be the first of its kind in California and that it has the potential to set precedence for more offshore aquaculture in our state. We believe a better offshore aquaculture evaluation process would involve an analysis of the entire California coast to determine the best locations for aquaculture operations instead of considering them on an as-proposed, piecemeal basis. We recommend that the Commission and partner agencies engage in such an effort before moving forward with permit considerations for future offshore aquaculture facilities. We understand that this project comes before the Commission without such analysis; therefore, if approved, it should include the best



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available practices and mitigation measures possible. As future aquaculture operations are proposed in California, we also recommend that monitoring results from this project, if approved, be used to inform best management practices for future operations considered in the state.

We appreciate the opportunity to comment on this application, and look forward to continued communication with staff, especially on the monitoring plan, should this project move forward. Please contact us if you have any questions regarding our comments.

Sincerely,

Sarah Abramson Sikich, MESM
Coastal Resources Director

Dana Roeber Murray, MESM
Marine & Coastal Scientist

January 6th, 2014

Cassidy Teufel
California Coastal Commission
45 Fremont Suite 2000
San Francisco CA. 94105

Re: Consistency Certification: CC-035-12 Phil Cruver/KZO SeaFarms/Catalina Sea Ranch/KZO Education (KZO)

OPPOSE

Dear Mr. Teufel,

Founded in 1993, Los Angeles Waterkeeper's mission is to protect and restore Santa Monica Bay, San Pedro Bay, and adjacent waters through enforcement, fieldwork, and community action. We work to achieve this goal through litigation and regulatory programs that ensure water quality protections in waterways throughout L.A. County. We have reviewed the staff report for Federal Consistency determination and feel that the project as proposed will impact our local waters and crucial marine habitats. It should not be approved, given the impacts to Los Angeles County nearshore marine habitats.

The staff report describes a number of potential risks from the project including

- 1) Water pollution to our nearshore environment
- 2) Impacts to sediment chemistry
- 3) Impacts to benthic organisms
- 4) Possible entanglement of marine mammals, some endangered species (Blue and Fin whales, for example)
- 5) Likely introduction of invasive species, with potentially catastrophic effects to nearby Marine Protected Areas (MPAs) off Palos Verdes Peninsula
- 6) Marine debris impacts in an already impacted marine environment
- 7) Impacts to commercial and recreational fishing with decreased fishing grounds.

From reading the staff report and conditions of approval, we are concerned that the commission recognizes all of these potential risks but may be planning to use the project as an experiment to document the actual environmental impact on the ocean and marine life. The waters off the coast of Los Angeles County are already significantly impacted by ALL seven points listed above, and need further protection from them, not additional impacts.

The staff report missed an important potential impact on Marine Protected Areas (MPAs), where in 2010 Palos Verdes received ecosystem-wide protections in sensitive areas as part of a science-based MPA network. As designed, the project will be an unprecedented source of invasive shellfish larvae that will be carried via currents to MPAs located in the state coastal zone. The impacts of this source of larvae on the natural environment are currently unknown but we already have many devastating freshwater and saltwater invertebrate and algal invasions to learn from, and it is critical we use extreme caution (Zebra mussel, Quagga mussel, Sargassum horneri, etc.). While Los Angeles Waterkeeper supports projects to restore native species, such as the Olympia oyster, we cannot support risking our marine resources on an experiment to grow invasive species in a way that has caused significant impacts to marine resources in other places.



The staff report identifies a smaller version of this type of operation being run in the Santa Barbara area. We suggest that this existing operation be used to document the impacts of open ocean shellfish aquaculture rather than permitting this much larger experimental operation off the coast of Los Angeles. This is particularly important considering that the project proponent obviously plans to scale this operation up to a much larger footprint as soon as possible. It is important that we get the data that is first collected from small experimental operations rather than permitting a large project with numerous known threats. Perhaps a project of this scale in Southern California could be located on an inland facility where the potential impacts to water quality and marine life can be better controlled and the larvae from the Mediterranean Mussels and Pacific Oysters will not pose a threat to our Marine Protected Areas and critical nearshore marine habitats.

Sincerely,

A handwritten signature in blue ink that reads "Brian Meux".

Brian Meux
Marine Program Manager
Los Angeles Waterkeeper

A handwritten signature in blue ink that reads "Liz Crosson".

Liz Crosson
Executive Director
Los Angeles Waterkeeper



**OCEAN
DEFENDERS
ALLIANCE**
Working for a debris free sea

Protecting and Restoring the Underwater World Since 2002

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1-3-2014

Cassidy Teufel
California Coastal Commission
45 Fremont Suite 2000
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**Re: Consistency Certification: CC-035-12 Phil Cruver/KZO
SeaFarms/Catalina Sea Ranch/KZO Education (KZO)
OPPOSE**

Hello Mr. Teufel

It just came to my attention today, that the CCC is going to approve a project that I feel is going to have a very detrimental effect on marine life in Southern California. The project is called "CC-035-12". It is an application by Phil Cruver of KZO Sea Farms to install a 100 acre shellfish aquaculture facility 8 miles off the coast of Long Beach.

I am the founder of Ocean Defenders Alliance, and we have been removing abandoned commercial fishing gear since 2002.

I find this project very disturbing. I have seen first hand how any gear that is in the water can harm and kill marine mammals, as well as fish and diving birds. We even documented an incident where some divers attached a line to the seafloor and ran it from just beyond the surf zone down to about 100 feet. It was taut against the seafloor. A dolphin got trapped in it and died.

In addition to the direct harmful effects, the introduction of non-native species of mussels and oysters to our waters seems like a disaster in the making. Those eggs that the mussels and oysters produce will be released into the environment and drift where nature takes them. This has the potential to create havoc with the local ecosystems., especially our recently enacted Marine Protected Area's..

I see no benefit to allowing this project to move forward. It will only benefit the owners of KZO Sea Farms.

Sincerely,
Kurt Lieber
President and Founder: Ocean Defenders Alliance
kurt@oceandefenders.org
www.oceandefenders.org
714-875-5881
19744 Beach Blvd #446
Huntington Beach, Ca



[Type a quote from the document or the summary of an interesting point. You can position the text box anywhere in the document. Use the Text Box Tools tab to change the formatting of the pull quote text box.]



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January 3, 2014

Cassidy Teufel
California Coastal Commission
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Re: Consistency Certification: CC-035-12 Phil Cruver/KZO SeaFarms/Catalina Sea Ranch/KZO Education (KZO)
OPPOSE

Dear Mr. Teufel,

Orange County Coastkeeper is an environmental organization with the mission to preserve, protect and restore the marine habitats and watersheds of Orange County. We have reviewed the staff report for Federal Consistency determination and feel that the project as proposed will impact state waters and marine resources and should not be approved. The staff report details a number of potential risks from the project including 1) water pollution 2) disturbance of sediment chemistry 3) displacement of benthic organisms 4) entanglement of marine mammals 5) introduction of invasive species 6) creation of marine debris 7) disruption of public access including commercial and recreational fishing.

From reading the staff report and conditions of approval it appears that the commission recognizes all of these potential risks but is planning to use the project as an experiment to document the actual impact the project will have on the ocean and marine life. Additionally the staff report missed an important potential impact the project may have on marine protected areas. As designed the project will create a huge source of invasive species larvae that will be carried along the currents to Marine Protected Areas located in the state coastal zone. The impacts of this source of larvae on the natural environment we are working to protect are unknown. While Orange County Coastkeeper supports projects to restore native species, such as the Olympia oyster, we cannot support risking our marine resources on an experiment to grow invasive species in a way that has caused significant impacts to marine resources in other places.

The staff report mentions that there is a smaller version of this type of operation being run in the Santa Barbara area. We suggest that this existing operation be used to document the impacts of open ocean shellfish aquaculture rather than permitting this much larger experimental operation. This is particularly important considering that the project proponent obviously plans to scale this operation up to a much larger footprint as soon as possible. It is important that we get the data we need first from small experimental operations rather than permitting something on the scale proposed. Ideally this entire operation should be located in an on land facility where the potential impacts to water quality and marine life can be eliminated and the larvae from the Mediterranean Mussels and Pacific Oysters will not pose a threat to our Marine Protected Areas.

Sincerely,

A handwritten signature in black ink that reads "Ray Hiemstra".

Ray Hiemstra
Associate Director
Orange County Coastkeeper

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**W16a**

CC Filed:	5/20/2013
3 Months:	8/20/2013
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Extended (Stayed) to:	1/13/2014
Staff:	C. Teufel-SF
Staff Report:	12/20/2013
Hearing Date:	1/8/2014

CONSISTENCY CERTIFICATION

Consistency Certification: CC-035-12

Applicant: Phil Cruver/KZO SeaFarms/Catalina Sea Ranch/KZO Education (KZO)

Location: Federal waters offshore of Los Angeles County.

Project Description: Install and operate a 100-acre shellfish aquaculture facility on the surface, seafloor, and in the water column approximately 8.5 miles offshore of Long Beach, Los Angeles County.

Staff Recommendation: Conditional Concurrence

SUMMARY OF STAFF RECOMMENDATION

KZO SeaFarms (led by Phil Cruver and also called Catalina Sea Ranch and KZO Education) submitted to the Coastal Commission a consistency certification to install and operate a 100-acre mussel and oyster aquaculture facility in open coastal waters approximately 8.5 miles offshore of Long Beach. The facility would be comprised of a variety of ropes, lines, buoys, and cultivation

equipment that would be anchored to the seafloor and held submerged at a depth of between 20 and 30 feet below the ocean surface. The majority of the facility – 38 of the 40 proposed cultivation longlines – would be used to grow a non-native species of mussel, the Mediterranean mussel (*Mytilus galloprovincialis*). The two remaining lines would be used for the cultivation of another non-native species, the Pacific oyster (*Crassostrea gigas*). KZO Seafarms (KZO) expects to cultivate and harvest approximately 500,000 individual adult mussels and oysters every 12 to 18 months (about 25,000 pounds).

The key Coastal Act issues raised by this project are to marine resources - including benthic habitats and marine wildlife – and commercial and recreational fishing. A variety of project alternatives were evaluated with regard to these Coastal Act issues, including different project sizes and locations. Based on the evaluation of these alternatives, KZO modified its initially proposed project to minimize potential conflicts with the marine resources and fishing policies of the Coastal Act by reducing its size from 1076-acres to 100-acres and relocating it from an area of open ocean several miles from shore and existing offshore infrastructure to a site farther from shore and approximately one half mile from one of the oil production platforms on the edge of the San Pedro Shelf. These changes would reduce the likelihood and magnitude of adverse impacts to marine resources and commercial fishing by limiting the creation of new areas in which such fishing would be restricted and reducing the project's potential to entangle marine mammals or alter seafloor habitats.

Despite this change, potential significant impact associated with the project include: (a) entanglement of marine wildlife in the project structure; (b) disturbance or alteration of seafloor habitats due to the deposition of biological material from the shellfish cultivation facility; (c) filtration of seawater by the cultivated shellfish; (d) collisions of project vessels with marine wildlife; (e) loss of commercial and recreational fishing grounds; and (f) loss/damage to fishing gear due to accidental contact with the project facility.

To address these potential impacts and minimize their likelihood and magnitude, the Commission staff is recommending that the Commission adopt conditions to provide for (a) the development and implementation of a robust independent monitoring program; (b) the implementation of marine wildlife entanglement minimization measures; (c) the development and implementation of a marine debris management program; (d) the development and implementation of a plan for the timely and complete removal of the facility upon project termination; (e) the establishment of a financial surety device to ensure that such removal is carried out; and (f) the development and implementation of a compensation plan to address the loss/damage of fishing gear that accidentally comes into contact with the facility.

With implementation of these mitigation measures and conditions, the Commission staff believes the project will be carried out consistent with the enforceable policies of California's Coastal Management Program. The Commission staff recommends the Commission **concur** with consistency certification CC-035-12.

TABLE OF CONTENTS

I. MOTION AND RESOLUTION	3
A. Consistency Certification.....	3
II. CONDITIONS	3
III. FINDINGS AND DECLARATIONS.....	7
A. Project Description.....	7
B. Project Alternatives	9
C. Federal Consistency	12
D. Other Agency Approvals and Consultations.....	14
E. Placement of Fill in Marine Waters.....	14
F. Marine Resources	17
G. Commercial and Recreational Fishing.....	34
H. Access and Recreation	42
I. Oil Spills.....	44

APPENDICES

[Appendix A – Substantive File Documents](#)

EXHIBITS

- Exhibit 1 – Proposed Project Location
- Exhibit 2 – Schematic Diagrams of Proposed Facility
- Exhibit 3 – Diagram of Oyster Cultivation Trays
- Exhibit 4 – Diagram of Mussel Cultivation Ropes
- Exhibit 5 – NMFS Comment letter to U.S. Army Corps of Engineers
- Exhibit 6 – Letters from the Commercial and Recreational Fishing Organizations
- Exhibit 7 – Commercial and Recreational Fishing Location and Use Data

Motion and Resolution

A. CONSISTENCY CERTIFICATION

Motion:

*I move that the Commission **conditionally concur** with KZO Sea Farms' consistency certification CC-035-12 that, if modified in accordance with the following conditions, the project described therein would be consistent with the enforceable policies of the California Coastal Management Program and would be conducted in a manner consistent with that program.*

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in a conditional concurrence with the proposed project and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution:

*The Commission hereby **conditionally concurs** with the consistency certification by KZO Sea Farms on the grounds that, if modified in accordance with the following conditions, the project described herein would be consistent with the enforceable policies of the California Coastal Management Program and would be conducted in a manner consistent with that program.*

I. CONDITIONS

1. Offshore Mariculture Monitoring Program. PRIOR TO COMMENCEMENT OF CONSTRUCTION, KZO shall submit for review and approval by the Executive Director of the Coastal Commission (Executive Director) a Revised Offshore Mariculture Monitoring Program. No construction shall commence until the Executive Director has approved the Revised Offshore Mariculture Monitoring Program. The Revised Offshore Mariculture Monitoring Program shall provide:

- (a) that all monitoring and research activities be carried out by independent, third party entities and be approved by and report to the Executive Director;
- (b) that all monitoring and research activities be carried out for a minimum of five years from the beginning of facility operations;
- (c) the frequency, duration, location, and methodology to be used for all sampling and monitoring activities;
- (d) the methodology to be used for all analysis and reporting of results;
- (e) that monitoring activities be designed and carried out in a manner that supports robust statistical analysis of results and includes a thorough sampling and evaluation of appropriate reference sites and pre-project baseline conditions;
- (f) that monitoring include an evaluation of the quantity, type, and distribution of biological materials from the shellfish facility (such as shellfish, shellfish feces and pseudofeces,

- shell material, and fouling organisms) that accumulate on the seafloor below and in the vicinity of the facility;
- (g) that monitoring include an evaluation of any changes to the chemical and biochemical conditions of seafloor sediments below and in the vicinity of the facility that may occur directly or indirectly as a result of the deposition of biological materials;
 - (h) that monitoring include an evaluation of any changes to the biomass, diversity, and oxygen demand of benthic infaunal and epifaunal communities that occurs below and in the vicinity of the facility;
 - (i) that monitoring include an evaluation of the response of fish, seabird, and marine mammal populations in the project area to the presence of the facility's infrastructure, biofouling organisms, and cultivated shellfish;
 - (j) that monitoring include estimates of the species diversity and abundance of the water column biota, including phytoplankton, zooplankton, and meroplankton;
 - (k) that monitoring include an evaluation of water quality at and around the facility, including analysis of phytoplankton and particulate material filtration by the cultivated shellfish and release of nutrients such as ammonia nitrogen and phosphorus;
 - (l) that monitoring include an evaluation of the type and amount of commercial and recreational fishing activity that occurs at and around the facility as well as compilation of all reports of lost or damaged fishing gear or catch that occurs as a result of contact with the facility;
 - (m) that monitoring include an evaluation of the production of eggs and larvae from the cultivated non-native species, the regional dispersion of this reproductive material, and its contribution to the regional presence, persistence, and expansion of populations of these non-native species outside of cultivation; and
 - (n) that monitoring include an evaluation of the diversity and abundance of fouling organisms that establish on the shellfish cultivation facility, including its ropes, buoys, cables, cultivation structures, and cultivated shellfish.

Compliance with the Offshore Mariculture Monitoring Program shall include annual reporting to the Executive Director for five years. The first annual report shall be submitted 12 months after completion of construction or initial shellfish planting activities, whichever date is first. These annual reports shall include:

- the data from all sampling and monitoring activities;
- a narrative summary of sampling and monitoring activities that were carried out and the techniques, methodologies, and equipment used to support them;
- an analysis of sampling and monitoring results; and
- a discussion of preliminary or final results and conclusions.

Within 60 days of the submittal of the year five annual monitoring report, a final report shall be submitted that includes:

- summary of all monitoring, sampling, and research results;
- discussion of the findings of each monitoring and research activity;
- recommendations for any adaptive management strategies, project modifications, or operational changes, needed to address project related effects to coastal uses and/or

resources that are substantially different than those originally described by KZO in its consistency certification;

- a plan submitted for Executive Director review and approval to implement the recommendations of the final report.

- 2. Marine Mammal Entanglement.** No less than once per month, KZO shall visually inspect all ropes, cables, and equipment to determine if any entanglement of a marine mammal has occurred and to ensure that: (a) no lines have been broken, lost or removed; (b) all longlines, anchor lines, and buoy lines remain taught and in good working condition; and (c) any derelict fishing gear or marine debris that collects on the facility is removed and disposed of at an appropriate onshore facility.

Inspections shall include video monitoring of anchors and attached lines, and SCUBA and video monitoring of longlines and mussel and oyster cultivation lines and equipment. Any wear or fatigue of materials shall be remedied as soon as feasible. All incidents of observed marine mammal entanglement shall be immediately reported to the National Marine Fisheries Service's Regional Stranding Coordinator (Sarah Wilkins: (562) 980-3230) and Commission staff. All incidents of potential entanglement (including dislodged, broken, or missing ropes, equipment, or gear) shall be detailed in a written letter and submitted to Commission staff within two days of their occurrence.

- 3. Lighting and Operations at Night.** All operations shall be completed during daylight hours. No operations at night and no artificial lighting of the shellfish cultivation facility shall occur, except for that associated with the use of navigational safety buoys required by the U.S. Coast Guard.
- 4. Construction Monitor.** A qualified marine wildlife observer approved by the Executive Director shall be onboard the project construction vessel during the installation of the longlines and anchoring system. That observer shall monitor and record the presence of marine wildlife (mammals and reptiles) and shall have the authority to halt operations if marine wildlife is observed or anticipated to be near a work area and installation activities have the potential to result in injury or entanglement of marine wildlife.
- 5. Notice to Mariners.** No less than 15-days prior to the start of in-water activities associated with the installation phase of the project, KZO shall submit to (a) the Executive Director; (b) the U.S. Coast Guard (for publication in a Notice to Mariners); and (c) the harbormasters and/or marina managers from Marina del Rey to Newport (for posting in their offices or public noticeboards), notices containing the anticipated start date of installation, the anticipated installation schedule, and the coordinates of the installation sites. During installation, KZO shall also make radio broadcast announcements on the local fishers' emergency radio frequency that provide the current installation location and a phone number that can be called for additional information.
- 6. Spill Prevention and Control Plan.** PRIOR TO COMMENCEMENT OF CONSTRUCTION, KZO shall submit for Executive Director review and approval, a project specific Spill Prevention and Response Plan (SPRP) for work barges and vessels that will be

used during project construction and operations. KZO and its contractors shall be trained in, and adhere to, the emergency procedures and spill prevention and response measures specified in the SPRP during all project operations. The SPRP shall provide for emergency response and spill control procedures to be taken to stop or control the source of the spill and to contain and clean-up the spill. The SPRP shall include, at a minimum: (a) identification of potential spill sources and quantity estimates of a project specific reasonable worst case spill; (b) identification of prevention and response equipment and measures/procedures that will be taken to prevent potential spills and to protect marine and shoreline resources in the event of a spill. Spill prevention and response equipment shall be kept onboard project vessels at all times; (c) assurances that all hydraulic fluid to be used for installation, maintenance, planting, and harvesting activities shall be vegetable based; (d) the use of at least one dedicated support boat during facility construction/installation activities to direct other non-project vessels in the project area away from the installation site; (e) a prohibition on at-sea vessel or equipment fueling/refueling activities; and (f) emergency response and notification procedures, including a list of contacts to call in the event of a spill.

- 7. Lost/Damaged Fishing Gear Compensation Program.** PRIOR TO COMMENCEMENT OF CONSTRUCTION, KZO shall submit for Executive Director review and approval, a Lost/Damaged Fishing Gear Compensation Plan that outlines the steps that would be taken by KZO to address any adverse impacts to commercial or recreational fishing operations that may result from the loss and/or damage of fishing gear or catch due to contact or entanglement with the shellfish cultivation facility or associated infrastructure. No construction shall commence until the Executive Director has approved the Lost/Damaged Fishing Gear Compensation Plan.
- 8. Update NOAA Charts.** WITHIN 60 DAYS OF FACILITY INSTALLATION, KZO shall submit evidence to the Executive Director that it has submitted to the NOAA Office of Coast Survey: (a) the geographic coordinates of the facility boundaries obtained using a differential geographic positioning unit or comparable navigational equipment; (b) as-built plans of the shellfish farm and associated buoys and anchors; (c) KZO's point of contact and telephone number; and (d) any other information requested by the NOAA Office of Coast Survey to accurately portray the location of the shellfish farm on navigational charts.
- 9. Letter of Credit.** PRIOR TO COMMENCEMENT OF CONSTRUCTION, KZO shall provide a letter of credit or other surety device acceptable to the Executive Director for \$100,000, and naming the Coastal Commission as the beneficiary/assured, to guarantee the faithful observance and performance by KZO of condition 8(a) above. The letter of credit or other surety device shall be maintained in full force and effect at all times until condition 8(a) has been met. Failure of KZO to meet the requirements of condition 8(a) shall cause the Coastal Commission to use the funds to effectuate the successful removal of the shellfish cultivation facility.
- 10. Facility Removal.** WITHIN 90 DAYS OF TERMINATION OF OPERATIONS, as determined by the Executive Director based on a lapse in planting, harvest, or maintenance activities, KZO shall submit a plan for (a) the timely removal of all shellfish, grow-out structures, anchoring devices, equipment, and materials associated with the shellfish

cultivation facility and (b) the conduct of a thorough inspection of the facility site by a qualified independent third party to verify the completion of removal activities. Upon approval by the Executive Director of the plan, KZO shall implement the removal and inspection plan in accordance with the time schedule specified therein and shall completely remove the shellfish cultivation facility, including all lines, ropes, buoys, anchors, and associated equipment and infrastructure.

- 11. Discharge of Biological Materials.** KZO shall not intentionally dispose of any equipment or waste, including living or dead shellfish, shells, or non-native fouling organisms into the marine environment. All maintenance cleaning operations of the cultivation facility, including its buoys, ropes, lines, cables, and anchors, shall be carried out onshore or in a contained manner sufficient to capture all dislodged biological materials. All non-native fouling organisms and biological materials from non-native organisms removed during these cleaning operations shall be collected and disposed at an appropriate upland facility. No discharge of untreated wash water or non-native fouling materials shall occur during maintenance cleaning operations.
- 12. Marine Debris.** PRIOR TO COMMENCEMENT OF CONSTRUCTION, KZO shall submit for Executive Director review and approval a Marine Debris Management Plan that includes (a) a plan for permanently marking all lines, ropes, buoys, and other facility infrastructure with the name and contact information of the facility operator; (b) a description of the extent and frequency of maintenance operations necessary to minimize the loss of materials and equipment to the marine environment resulting from breakages and structural failures; (c) a description of the search and cleanup measures that would be implemented if loss of shellfish cultivation facility materials, equipment, and/or infrastructure occurs. No construction shall commence until the Executive Director has approved the Marine Debris Management Plan.

II. FINDINGS AND DECLARATIONS

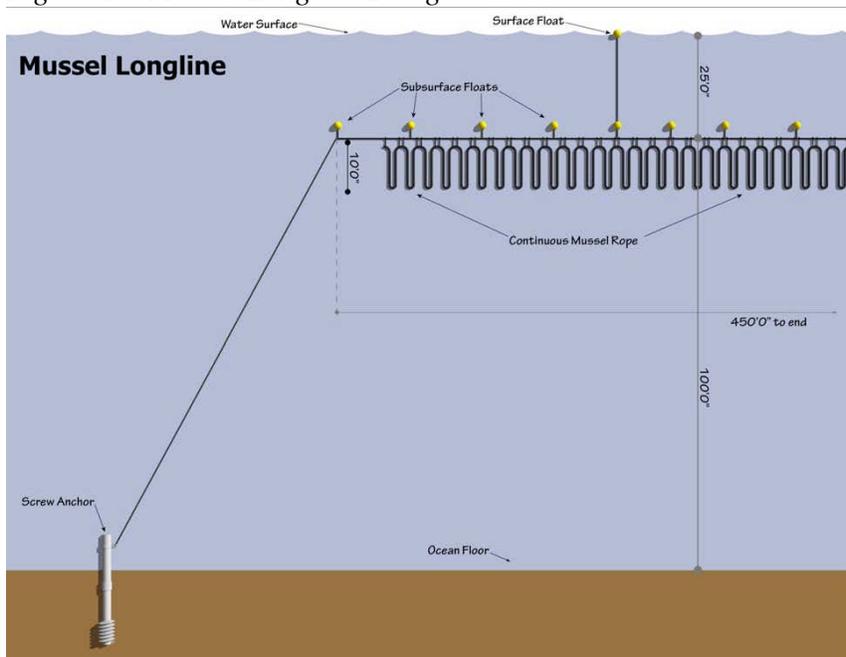
A. PROJECT DESCRIPTION

KZO Sea Farms/Catalina Sea Ranch/KZO Education (KZO) is requesting authorization to install and operate a 100-acre shellfish aquaculture facility in federal waters approximately eight miles off the coast of Los Angeles County (as shown on [Exhibit 1](#)). The proposed facility would be comprised of a horizontal grid of ropes, cables, and lines held in place underwater at a minimum depth of 20-feet by a series of surface buoys and seafloor anchoring devices. This grid of lines would support hanging ropes seeded with Mediterranean mussels (*Mytilus galloprovincialis*) and hanging nets containing Pacific oysters (*Crassostrea gigas*), Olympia oysters (*Ostrea lurida*), and rock scallops (*Hinnites mylirugosus*).

In total, 40 submerged longlines of 500 feet in length are proposed to be spaced 100 feet apart and anchored to the seafloor in water depths of approximately 150 feet (as shown in [Exhibit 2](#)). Two of the 40 longlines would be used for cultivation of oysters and/or scallops in nets (100 40-inch long nets per longline) and the remaining 38 would be used for mussel cultivation. Each longline would be held in place by up to ten 16-inch polyethylene surface floats attached to the longlines with 20-foot lengths of rope and up to 40 similar submerged floats attached directly to

the longline. In addition, an approximately one-foot diameter helical screw anchor would be embedded in the seafloor at each end of the longlines and a U.S. Coast Guard approved lighted surface buoy would be attached to each anchor with an approximately 160-foot length of rope. Attached to each of the 38 mussel longlines would be 3,600-feet of continuous cultivation rope that would be tied off at regular intervals and extend 15-feet below the longline in loops (as shown in Figure 1 below). The proposed footprint of the facility on the ocean surface would be limited to the approximately 1350 surface floats and buoys that would be installed at intervals of roughly 18-feet along each longline within the approximately half-mile long by half-mile wide area occupied by the underwater aquaculture facility. The footprint of the facility on the seafloor would be limited to about 84-square feet, the combined area needed to install the 84 proposed helical screw anchors that would hold the facility's long lines in place. Each screw anchor is comprised of a 12-foot long steel shaft and approximately one square foot screw plate that would be rotated into the seafloor.

Figure 1 – Mussel Longline Design



Once installed, the majority of maintenance and operational activities carried out on the shellfish cultivation facility would be vessel-based. Onshore operations would be limited to administrative work based out of existing office facilities, the loading of mussel and oyster seed, and the offloading and transport of harvested shellfish to an existing processing facility located near San Pedro. Storage of purchased and imported shellfish seed (anticipated to be purchased from Taylor Shellfish of Washington) would occur at the Southern California Marine Institute facility on Terminal Island in San Pedro and vessel berths at this site would be used to load this seed onboard vessels for transport to the aquaculture site. Offloading would occur in San Pedro and trucks would be used to transport the harvested shellfish to a processing facility located in the Long Beach/San Pedro area. To support its offshore operations, KZO would have two principal vessels available to transport personnel, equipment, and shellfish product between the offshore facility and the San Pedro area. Maintenance and operational activities are anticipated

to require roughly four vessel trips to and from the facility per week. On average, vessel-based work would be carried out at the facility for a total of 15-hours per week. The primary project vessels proposed to be used include a 14-foot tender boat and a 75-foot operations and harvest boat equipped with hydraulic winches and landing area used to recover cultivated shellfish from the facility once it reaches market size.

Ongoing operations at the shellfish cultivation facility would include equipment and materials inspections and maintenance as well as planting and harvest. Maintenance and inspections on the longlines are proposed to be carried out on a monthly basis while the lines are lifted out of the water to allow additional buoys to be installed (as the size and weight of the cultivated shellfish increase, additional floats must be added to maintain their position in the water column). Inspections of the anchor ropes, anchors, and connecting tackle is proposed to be carried out every five years with a light and video equipped remotely operated vehicle (ROV). Planting and harvest activities for the oyster nets begin when each of the 200 proposed 40-inch nets are filled with small seed oysters and then re-attached to the longline ropes and placed in the ocean (as shown in [Exhibit 3](#)). The trays would then be recovered from the water every three months so that dead and especially slow growing oysters can be removed and the rest can be sorted by size and returned to the water until harvest. Harvest activities are carried out from 12 to 18 months after initial planting and are expected to yield a total of approximately 80,000 individual market-sized oysters (about 7,000 pounds) from the 200 nets. Cultivation of rock scallops would be carried out in a similar manner.

Mussel cultivation would rely on a two-phase system using seed ropes and mussel grow-out ropes. To each of the 38 mussel longlines would be attached 18 ten-foot long by three-inch diameter seed ropes. These ropes would have a lead core and be weighted by a foot-long piece of rebar on the bottom and tied by a small nylon rope to the backbone. Attached to the hanging rope would be roughly 50,000 small seed mussels. A cotton tube with narrow mesh would be rolled over the seed lines to help hold the mussels in place until they attach to the seed rope. The cotton mesh is expected to deteriorate after three weeks and leave the mussels behind in a symmetrical array along the rope surface. After three months of growth, the seed ropes would be hauled onto the work boat, stripped of mussels, and brought ashore for re-seeding. The mussels stripped from the seed rope would be collected and loaded into a socking machine on the work boat. This machine would place the mussels along a continuous two and a half-inch diameter, lead core rope and wrap them in place with cotton mesh socking material. The continuous rope would then be draped under the longline in loop fashion as shown in [Exhibit 4](#) and Figure 1 above. Each loop would extend approximately 15-feet below the longline and would be attached to the longline with two small nylon ropes. After approximately eight months, the continuous mussel rope would be recovered by the work boat and all mussels on it would be removed and harvested for transport to shore and sale. In total, each of the 38 longlines would support 3,600-feet of continuous mussel rope and produce an estimated 18,000 pounds of mussels at harvest (360,000 individual mussels).

B. PROJECT ALTERNATIVES

Both KZO and Commission staff evaluated several project alternatives to determine if potential impacts associated with the proposed project could be avoided or further minimized. These alternatives included alternative sizes, configurations and sites for the project. Alternative sites

considered included placement of the aquaculture facility adjacent to, nearby, or between the existing oil production platforms on the edge of the San Pedro Shelf; placement of the facility at the edge of the San Pedro Shelf; and placement of the facility within Santa Monica Bay. These alternatives are discussed below. As a result of the consideration of project alternatives, KZO made two significant modifications to the project: a reduction in its overall size from 1,000-acres to 100-acres, and relocation of the proposed site approximately two miles further offshore to a within approximately one half mile of Platform Edith.

Alternative Project Sizes

When the Commission staff was initially notified about the proposed project, KZO was proposing to install and operate an aquaculture facility over ten times larger than the current proposal that would have covered a 1,076-acre area within the San Pedro Shelf. During the course of the Commission's process of requesting permission from the National Oceanic and Atmospheric Administration's Office of Coastal Resource Management (OCRM) for the authority to review the proposed project and KZO's initial consultation with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), a general analysis was carried out of the project's potential impacts to fisheries, marine mammals, and the marine environment. The Commission staff's analysis indicated that the proposed 1076-acre facility had the potential to cause a variety of adverse impacts to these coastal resources, including: entanglement of marine wildlife; release of marine debris; collisions between project vessels and marine mammals; exclusion/deterrence of marine predators; and loss of commercial and recreational fishing grounds. This analysis is further detailed in the Commission's March 22, 2012, letter to OCRM, and as it was provided to KZO and further discussed by agency staff, KZO decided to amend its project to reduce its size from 1076-acres to 100-acres as a means of minimizing the likelihood and scope of its impacts.

As noted in the Commission staff's April 12, 2012, letter to OCRM:

The roughly ten-fold reduction in the proposed size of the offshore shellfish farm, from 1076 acres to 100 acres, is expected to affect the frequency and magnitude of the effects it would have on California's coastal uses and resources. However, these effects would not be eliminated by this reduction in acreage and would still be reasonably foreseeable. Although small relative to the initial 1076 acre proposal, considered outside of the context of this comparison, a 100 acre open ocean shellfish farm is still a large facility that would require a substantial amount of equipment to be installed and maintained in the marine environment. Based on a review of our permit files, this proposed open ocean shellfish farm would be the largest of its kind in California and represent a significantly larger and more complex aquaculture operation than any that has previously been pursued or authorized in state or federal waters offshore of California.

While the reduction in the project's size is likely to reduce its environmental and fisheries impacts, as discussed in the above report, the project still has the potential to adversely affect marine resources and fisheries. A variety of additional alternatives were therefore considered by KZO and Commission staff.

Alternative Sites

Apart from a reduction in the size of a project's physical footprint, siting is typically the most effective way to influence the type, scale, and likelihood of a project's impacts. Because KZO used only a limited set of parameters (primarily region, depth, and distance from shore) and very little consideration of potential impacts (limited to input from the U.S. Coast Guard regarding shipping traffic) to guide its selection of the initially proposed project site, during the course of the Commission's analysis, a variety of alternative project sites were also considered. Due to the applicant's desire to maintain the project in federal waters near the Los Angeles area, these sites were limited in geography and included areas in the outer San Pedro Shelf and Santa Monica Bay.

Santa Monica Bay

Several sites were also considered in Santa Monica Bay. Information provided by commercial fishing groups indicated that such fishing is prohibited within Santa Monica Bay, providing a potential opportunity for the project to be relocated to another area that would eliminate potential project impacts to commercial fishing. However, unlike the San Pedro Shelf, which is characterized by a relatively shallow plateau that extends between eight and ten miles offshore, Santa Monica Bay drops off to depths exceeding 200-feet much closer to shore. Therefore, areas within this water body that met KZO's siting parameters – at least three miles from shore and with water depths of 160-feet or less – are very limited. In fact, the only such area of sufficient size to support the proposed project is located offshore of El Segundo, adjacent to the City of Los Angeles' sewage outfall system. Although the material discharged from this system is treated, KZO rejected this alternative as infeasible due to concerns about the potential health implications of cultivating large numbers of filter feeding shellfish at this site.

Outer San Pedro Shelf

The results of Commission staff's preliminary analysis of the project indicated that the initially proposed project site would be very likely to result in substantial adverse impacts to commercial and recreational fishing. This analysis was based on close coordination with the staff of the California Department of Fish and Wildlife's Marine Region and review of fisheries data that they collect and maintain. In addition, independent review of the project by organizations representing the commercial and recreational fishing sectors in the project area resulted in a variety of concerns expressed about anticipated adverse impacts to future fisheries activities at and around the project site. At the encouragement of Commission staff, KZO met with interested fishermen to discuss these concerns and potential solutions. This meeting was held in San Pedro on August 9, 2013, and included recommendations that KZO evaluate potential alternative sites on the outer San Pedro Shelf in close proximity to existing oil platforms in that area (the fishermen indicated that fishing activities in that area were already limited due to the presence of the platforms).

Commission staff and KZO evaluated three primary alternate sites in the vicinity of the existing oil production platforms on the outer San Pedro Shelf: a site adjacent to or attached to one of the platforms; a site between two of the platforms; and a site located within approximately a half mile of the most shoreward platform.

The first of these alternatives, a site adjacent to or attached to one of the platforms was evaluated first. This alternative would have eliminated the potential for adverse impacts to commercial fishing from occurring (no commercial fishermen approach the platforms closely due to concerns about contact with the structure and resulting damage/loss to gear and/or catch) and would have minimized potential marine resource impacts because it would have allowed for a more limited use of anchoring devices and consolidated potential impacts to benthic and water column habitat with similar existing impacts associated with the presence of the platform. However, further consideration of this alternative by KZO and Commission staff resulted in its rejection because it was infeasible. After reaching out to the operators of the platforms, KZO was informed that these operators would oppose such a project due to its potential implications to their ongoing oil and gas production and processing operations. In addition, Commission staff learned of regulations established by the U.S. Coast Guard (included in 33 CFR Part 147) that establish safety zones around oil platforms and prohibit the entrance or use of vessels within 500-meters of them.

The second alternative site on the outer San Pedro Shelf – a site between two of the three platform complexes – was also considered and rejected. While this alternative would have benefits in terms of reducing or eliminating potential impacts to commercial fishing, records of recreational fishing activity in the project area maintained by DFW that show use of the waters around the platforms by private recreational boats to be consistent and high, suggest that potential impacts to recreational fishing would increase under this alternative. Additionally, the close configuration of the platform complexes means that only a limited area exists between them that is not within a U.S. Coast Guard 500-meter safety zone. The resulting restrictions on vessel use in this area would have added significant complication and limitations to KZO's operation were it located in this area. Further, KZO also indicated that the water depths at this location on the edge of the San Pedro Shelf (180 to 210 feet) are beyond the design parameters of the proposed aquaculture structure.

Based on information established during the review of the previous alternative sites, KZO considered a the third alternative site in the vicinity of the platforms – a site in the shallower waters shoreward of the innermost platform, Platform Edith, and far enough outside the platform's safety zone to not adversely affect project operations. As discussed in the Commercial and Recreational Fishing Section of the report, KZO selected this site as the preferred project alternative. The Commission also believes this site is the preferred alternative because its location within a half mile of Platform Edith is an area in which commercial fishing is already restricted due to the risk of loss or damage to fishing gear resulting from accidental contact with the platform structure. This means that the aquaculture facility at this site would reduce the likelihood and magnitude of adverse impacts to commercial fishing by limiting the creation of new areas in which such fishing would be restricted.

C. FEDERAL CONSISTENCY

On February 22, 2012, the Commission received notice of KZO's application for a "Section 10" permit from the U.S. Army Corps of Engineers (as discussed below). While such permits are "listed" in the California Coastal Management Program (CCMP), for activities located fully outside the coastal zone, the Commission needs permission from the National Oceanic and

Atmospheric Administration's Office of Coastal Resource Management (OCRM) before it can review the activity. On March 22, 2012, the Commission submitted a request to OCRM for permission to review the proposed installation of a 1076-acre shellfish cultivation farm within federal waters approximately four miles offshore of Huntington Beach. During the course of OCRM's review of this request, the project applicant, KZO Seafarms, reduced the proposed size of the facility from 1076-acres to 100-acres. In a letter to OCRM dated April 12, 2012, the Commission re-iterated its request to review the project despite the reduction in size. On June 25, 2012, the Commission received OCRM's approval of its review request under the Coastal Zone Management Act. On July 12, 2012, Commission staff received a consistency certification from KZO for the proposed 100-acre open ocean shellfish cultivation facility described above. During the course of the Commission staff's review process, on December 10, 2013, KZO modified its consistency certification by changing the proposed project site. In addition, KZO and the Commission staff signed a "stay" agreement, effectively extending the consistency review period. The extended review period would end on January 13, 2014.

Conditional Concurrences

Section 15 CFR § 930.4 of the Federal Consistency regulations provides, in part, that:

(a) Federal agencies, applicants, persons and applicant agencies should cooperate with State agencies to develop conditions that, if agreed to during the State agency's consistency review period and included in a . . . Federal agency's approval under Subparts D, E, F or I of this part, would allow the State agency to concur with the Federal action. If instead a State agency issues a conditional concurrence:

(1) The State agency shall include in its concurrence letter the conditions which must be satisfied, an explanation of why the conditions are necessary to ensure consistency with specific enforceable policies of the management program, and an identification of the specific enforceable policies. The State agency's concurrence letter shall also inform the parties that if the requirements of paragraphs (a)(1) through (3) of the section are not met, then all parties shall treat the State agency's conditional concurrence letter as an objection pursuant to the applicable Subpart and notify, pursuant to §930.63(e), applicants, persons and applicant agencies of the opportunity to appeal the State agency's objection to the Secretary of Commerce within 30 days after receipt of the State agency's conditional concurrence/objection or 30 days after receiving notice from the Federal agency that the application will not be approved as amended by the State agency's conditions; and

(2) The Federal agency (for Subpart C), applicant (for Subparts D and I), person (for Subpart E) or applicant agency (for Subpart F) shall modify the applicable plan, project proposal, or application to the Federal agency pursuant to the State agency's conditions. The Federal agency, applicant, person or applicant agency shall immediately notify the State agency if the State agency's conditions are not acceptable; and

(3) The Federal agency (for Subparts D, E, F and I) shall approve the amended application (with the State agency's conditions). The Federal agency shall immediately

notify the State agency and applicant or applicant agency if the Federal agency will not approve the application as amended by the State agency's conditions.

(b) If the requirements of paragraphs (a)(1) through (3) of this section are not met, then all parties shall treat the State agency's conditional concurrence as an objection pursuant to the applicable Subpart.

D. OTHER AGENCY APPROVALS AND CONSULTATIONS

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (ACOE) has regulatory authority over the proposed project under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 1344). Section 10 of the Rivers and Harbors Act regulates the diking, filling and placement of structures in navigable waterways.

For the subject project, ACOE issued a provisional permit under Section 10 of the Rivers and Harbors Act on July 17, 2012. This provisional permit includes a variety of general and specific permit conditions, including requirements that, prior to commencement of operations, KZO submit, for ACOE approval, a monitoring plan for the seawater filtration effects, biodeposition, and changes in the abundance/distribution of non-native fouling organisms. The provisional permit also specifies that it is not valid and does not authorize the project to be carried out because "By Federal law, no [ACOE] permit can be issued until the state has concurred with a permit applicant's CZM consistency certification." In response to changes in the proposed project that occurred after this provisional permit was issued (including the modified project location), ACOE expects to recirculate its public notice about the permit application and open a two-week comment period.

National Marine Fisheries Service

The National Marine Fisheries Service (NMFS) has responsibilities over the proposed project under the Marine Mammal Protection Act (MMPA), the Magnuson-Stevens Fisheries Conservation and Management Act (MSA), the Endangered Species Act (ESA), and the Fish and Wildlife Coordination Act. NMFS provided comments on the proposed project to ACOE during its initial review process (see NMFS comment letter in **Exhibit 5**) but prior to the recent change in the proposed project site. At this time, NMFS does not plan to submit additional comments if ACOE provides an additional comment period for the modified project site.

E. PLACEMENT OF FILL IN MARINE WATERS

Section 30233(a) of the Coastal Act states in part:

The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

- (1) *New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
- (2) *Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
- (3) *In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.*
- (4) *Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
- (5) *Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
- (6) *Restoration purposes.*
- (7) *Nature study, aquaculture, or similar resource dependent activities.*

The proposed installation of 84 anchoring devices on the seafloor constitutes the placement of fill in open coastal waters. Coastal Act Section 30233(a) restricts the Coastal Commission from authorizing a project that includes fill of open coastal waters unless it meets three tests. The first test requires that the proposed activity must fit into one of seven categories of uses enumerated in Coastal Act Section 30233(a). The second test requires that there be no feasible less environmentally damaging alternative. The third test mandates that feasible mitigation measures be provided to minimize the project's adverse environmental effects.

Allowable Use Test

One of the seven allowable uses of fill under 30233(a) is aquaculture. Because the proposed anchoring devices would support a shellfish aquaculture facility, the Commission finds that the proposed project meets the allowable use test of Coastal Act Section 30233(a).

Alternatives

The Commission must further find that there is no feasible less environmentally damaging alternative to the proposed placement of fill in open coastal waters. No known project alternatives would meet the objective of the proposed project – to install and operate an open ocean shellfish aquaculture facility – without the placement of at least some fill material in open coastal waters. While options that would not include fill were considered, such as using existing oil platforms in the area as moorings for the longlines, Commission staff determined that U.S. Coast Guard regulations¹ establishing a 500 meter vessel preclusion zone around these platforms would make such alternatives infeasible.

KZO therefore evaluated several alternative anchoring systems that would require differing amounts of fill. These anchoring systems included weighted mooring blocks, Jayco “Stingray” anchors, and other types of traditional anchors as well as the proposed helical screw anchors. Among the anchoring systems that were considered, the proposed helical screw anchoring

¹ 33 CFR 147.1104, 33 CFR 147.1108, 33 CFR 147.1111

system would result in the least amount of fill material on the seafloor. In fact, this anchoring system would have a permanent footprint on the seafloor that would be several times smaller than any other type of anchor considered in KZO's evaluation. In addition, the proposed anchoring system would not make use of the anchor chain and connecting tackle that several of the other systems require and would therefore result in a smaller temporary disturbance footprint as well, since anchor chain and tackle would not be in place to sink to the seafloor during periods of low tension.

Although installation of the helical screw anchor system would require the use of a 1,650-pound hydraulic powered underwater drill machine, this machine would be lowered to the seafloor from a surface vessel, would be equipped with a differential GPS device to ensure accurate positioning, would only be maintained in place at each anchoring site temporarily, and would have a limited footprint of approximately three square feet (the combined footprint of the three legs of the drill machine).

If the applicant agrees to the conditions listed on pages three through seven above, the Commission would be able to find that the second test of Coastal Act Section 30233(a) has been met.

Mitigation

The final requirement of Coastal Act Section 30233(a) is that filling of coastal waters may be permitted if feasible mitigation measures have been provided to minimize any adverse environmental effects associated with that fill. In other sections of this report, the Commission has identified feasible mitigation measures that will minimize the adverse environmental effects associated with the placement of fill. For example, the section below includes a discussion of adverse impacts associated with the potential release of hazardous materials from hydraulically powered equipment such as the drill proposed to be used to install the screw anchors and describes measures to minimize that risk, including the provision in [Condition 6](#) that KZO develop and submit for review and approval a Spill Prevention and Response Plan that ensures that adequate spill prevention measures are taken and response capability is provided during activities that may result in a spill. If the applicant agrees to the conditions listed on pages three through seven above, the Commission would be able to find that the third test of Coastal Act Section 30233(a) has been met and that the proposed project, as conditioned, would therefore be consistent with Coastal Act Section 30233(a).

F. 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.

Placement and operation of the proposed shellfish aquaculture facility has the potential to affect marine species, habitats, and biological productivity through disturbance, loss, and alteration of benthic habitat; deposition of organic materials; disturbance and entanglement of marine wildlife; release of marine debris; filtration of marine waters; attraction and growth of invasive fouling organisms; release of reproductive materials from non-native species; alteration of water column habitat; and collision of project vessels with marine mammals or sea turtles.

Benthic Habitat

The proposed shellfish cultivation facility would be installed near the edge of the San Pedro Shelf in approximately 160-feet of water. The San Pedro Shelf is an area of relatively shallow, gently sloping seafloor that extends roughly ten miles offshore in a southerly direction from Long Beach. This area is one of the broadest continental shelf segments between Monterey and the U.S.-Mexico border. Benthic habitat, bathymetric, and marine geological surveys carried out on the San Pedro Shelf over the past several decades by academic institutions and the U.S. Geological Survey, in partnership with the Sanitation Districts of Los Angeles County and the Orange County Sanitation District, provide detailed information about the physical and biological makeup of the seafloor at and around the project site (Wong et al. 2012). These studies indicate that the seafloor at the project site is composed of low-relief soft bottom habitat composed of nearly 80% sand. The seafloor geology and benthic habitat surveys carried out by Wong et al. (2012) also indicate that the benthic habitat present at the project site is the dominant habitat type in the larger San Pedro Shelf area, existing within nearly 75% of the 154-square mile area surveyed. During ROV video surveys of nearby habitat areas on the San Pedro Shelf with similar depth and sediment characteristics, the presence of only trace numbers of epifaunal (surface dwelling) organisms was observed (Wong et al. 2012). Organisms observed by Wong et al. were made up primarily of sand stars (*Luidia foliolata*), white urchins (*Lytechinus anamesus*),

and sea pens (pennatulids); species commonly found on soft substrate habitat within water depths of 100-200 feet offshore of California. Surveys of infaunal (sediment dwelling) organisms carried out by KZO at a nearby site with similar depths and habitat characteristics suggest that over 150 species of invertebrates are likely to be present in the soft substrate below the proposed aquaculture facility and that the infaunal community at the proposed site is likely consistent with and part of a larger scale community that is structured by ecological processes that act at larger local or regional scales (Mooney 2013).

Several aspects of the proposed project have the potential to affect benthic habitat below the aquaculture facility and in surrounding areas. These include the placement of the proposed anchoring devices for buoys and longlines, and the accumulation on the seafloor of biological material from the facility (such as shellfish, shells, and fouling organisms that may become dislodged during cultivation, harvest, or maintenance activities and shellfish feces, pseudofeces, and nutrients released by the cultivated shellfish).

Anchor Placement

Placement of anchoring devices on the seafloor would result in loss and disturbance of seafloor habitat and displacement of epifaunal and infaunal organisms from within the footprint of each anchor. KZO proposes to use two helical screw anchors to install each of the 40 proposed longlines to the seafloor as well as an additional helical screw anchor to secure each of the four corner marker buoys. The footprint of each of these 84 anchors would be roughly one square foot in size and they would be spread along the perimeter of the proposed 100-acre site.

Although all 84 of the proposed anchor installation sites would be within areas of soft substrate, adverse impacts to epifauna and infauna in these habitat areas would be minimal. The proposed anchors would have a very limited footprint – a two inch diameter shaft leading to a one square foot screw plate that would be buried approximately 12-feet into the seafloor – and would not require the use of large connecting tackle that could sink and further disturb adjacent seafloor habitat. While some adverse impacts to invertebrate species such as the sea pens, sand stars, and urchins that were shown in ROV surveys of the project area would occur if these organisms are present within an anchoring footprint at the time of anchor installation, the total soft-bottom habitat area to be disturbed by the proposed project would be small and regionally insignificant when compared to the geographical extent of this habitat type within the San Pedro Shelf. In addition, many soft substrate organisms are mobile and would re-colonize and recover quickly after the initial installation of the proposed anchoring units. In their post-installation survey and review of a submarine cable with similar diameter to the proposed anchor shafts, Kogan et al. (2006) found little variation in the abundance or diversity of soft substrate organisms between cable sites disturbed during installation activities and non-disturbed reference sites. Such research suggests that the proposed placement and presence of the anchoring units on approximately 84 square feet of seafloor would therefore not result in adverse impacts to soft bottom habitats or organisms.

Accumulation of Biological Materials

Extensive research has shown that over time, the seafloor below shellfish aquaculture facilities can accumulate large amounts of biological material that becomes dislodged or discharged from the facility above and sink through the water column. Such material typically includes feces and

pseudofeces² from the cultivated shellfish (collectively known as biodeposits); fouling organisms such as algae, barnacles, sponges, and other species of shellfish that settle on the artificial hard substrate of the facility and become dislodged due to natural processes or operational activities; and cultivated shellfish or shells that also become dislodged from the cultivation structure during growth, storm events, predation from marine wildlife, cleaning, and harvest activities. The accumulation of this material on the substrate below mussel aquaculture facilities is the most commonly discussed environmental impact in the international scientific literature. Research on mussel aquaculture farms in Maine, Sweden, Scotland, and New Zealand, several of the areas with large existing mussel aquaculture industries, suggest that up to four inches per year of biodeposits and shell material can accumulate in areas below active mussel farms (Mattsson and Linden 1983, Wilding and Nickell 2013). Overall, the total amount of organic enrichment of the substrate below an active aquaculture facility can be substantial and can lead to a variety of direct and indirect effects.

As shown by Wilding and Nickell (2013), Wilding (2012), and a wide variety of prior research, direct effects of organic enrichment include alteration of the physical structure and composition of seafloor sediment, alteration of the chemical makeup of sediments, and changes to the community structure of benthic organisms.

While the accumulation and subsequent decomposition of organic materials affects physical sediment characteristics such as grain size and composition, the largest impact on the physical structure of the seafloor sediment expected to occur beneath the proposed shellfish cultivation facility would be from the deposition of intact and broken shells (Tenore et al 1982; Kaspar et al 1985; Stenton-Dozey et al 2005). As these shells are fed upon and deteriorate further they are broken into a matrix of calcium carbonate fragments known as shell hash. Studies of mussel farms have consistently shown that high levels of shell hash can accumulate in soft sediments; the estimates of Mattsson and Linden (1983) that between 2,000 and 4,000 shells per square meter can be deposited per year below an active mussel farm have often been corroborated (recently, in Wilding and Nickell 2013). As the proportion of shell hash in the substrate increases, it may influence the type and abundance of invertebrate species that live on and in it, thus altering the structure and productivity of the ecological community in the affected area.

Changes to sediment chemistry that have been observed to result from the organic enrichment of sediments with biological material from overlying mussel farms typically consists of an increase in sediment oxygen demand (as this biological material decomposes) and an upward shift in the zone in which sulfides are formed (Pearson and Rosenberg 1978). Because many species typically found in soft substrates are not particularly tolerant of sulfides, this chemical shift often results in the loss of larger, more complex sediment dwelling organisms, and a shift towards a lower diversity assemblage of sulfide specialist species (Weston 1990; Tenore et al 1982).

² Filter feeding shellfish including mussels feed by pumping water through specially adapted gills that act as filters to trap particulate matter. Trapped particles are then wrapped in mucus and either ingested as food or ejected as pseudofeces. Typically many times larger than the particulate matter naturally found in the water column, this pseudofeces sinks to the bottom more readily.

At the most basic level, the deposition of organic material beneath a shellfish farm causes an influx of predatory and scavenging species that are able to exploit the organic material as a source of consistent food. Species such as polychaete worms and starfish have frequently been observed in particularly high density in these environments within a fairly short period ranging from weeks to months. As demonstrated in Wilding and Nickell (2013), the density of starfish below mussel farms off the Scottish coast was two to 27 times higher than at a distance of several hundred feet away. Fundamental ecological models of seafloor sediments subjected to organic enrichment indicate that as organic materials increase, trophic community structure shifts (Weston 1990), the abundance of organisms increases and the biomass and number of species declines (Pearson and Rosenberg 1978). However, as noted above, the effect of organic enrichment on sediment chemistry can often reduce the abundance of organisms as well as selective pressures promote a more limited suite of species adapted to low oxygen, high sulfide sediments.

For the most part, the direct effects noted above are limited in extent to the area immediately beneath a cultivation facility and its adjacent vicinity. However, some research has shown that indirect effects can also occur which can impact a larger area. For example, Inglis and Gust (2003) describe how the elevated density of predatory invertebrates such as starfish that can accumulate on the seafloor below an aquaculture facility as a result of the consistent and robust food source it provides can serve to boost reproductive rates and lead to augmented populations of predatory invertebrates on a scale that extends beyond the benthic footprint of the facility.

While site specific physical characteristics such as depth and current velocity typically do not have a large effect on the amount of biological material released from an aquaculture facility – this is typically determined by operational factors such as cultivation practices and quantities – such site characteristics are likely to play a large role in determining how concentrated discharged and dislodged biological materials become and how far they disperse, essentially, the size and severity of the facility’s “footprint” on benthic habitat. Based on Commission staff’s review of available research, the great majority of shellfish aquaculture operations carried out worldwide appear to be located in nearshore waters (less than one mile from land) and are therefore often in areas with shallower waters and more restricted water movement than the open ocean site selected by KZO. The applicability of evidence these operations provide regarding accumulation rates and dispersal distances for biological materials must therefore be considered carefully, with a close examination of physical site characteristics such as current speeds and depths.

With this in mind, research carried out on mussel farms located in narrow deep water inlets, sounds, and lochs (such as those of Scotland and New Zealand), that includes study sites with similar depths and current velocities as the proposed KZO site (described by KZO as having an average depth of 150-feet and current speeds of 0.25 to 1 knot) is useful to consider. An examination of Wilding and Nickell (2013) and Wilding (2012) suggests that an accumulation of substantial quantities of biological material can occur even at deep sites (over 100-foot depth) with currents several times higher than those expected at the proposed KZO site. This research further indicates that the effects of this accumulation in terms of physical, chemical, and ecological effects can extend up to several dozen feet beyond the boundaries of a shellfish cultivation facility. For the KZO facility, with proposed dimensions of 2060-feet by 2145-feet,

this suggests that an additional two acres around the periphery of the 100-acre facility is likely to be affected by the deposition and accumulation of organic material.

Research suggests, however, that the magnitude, exact extent, and even the nature (positive or negative) of these impacts is largely determined by a number of site specific factors such as the natural chemical makeup of sediments in the area and can be difficult to predict in advance. While the research literature contains many examples of mussel farms whose underlying sediment has suffered from extensive organic enrichment and has become oxygen limited and sulfide rich - with resulting adverse impacts to biological productivity and diversity - other examples are also available in which the deposition of similar amounts of biological material has not triggered the same effects and has instead lead to apparent increases in biodiversity and/or biological productivity. As suggested by Wildling (2012), at the heart of this difference may be the natural chemical nature of the sediments within the benthic footprint of the mussel farm:

Where farms are located over sediments with background redox values of 100 mV [millivolts], the farm footprint may manifest itself as a region of reduced biodiversity associated with anoxic sediments and high sulphide concentrations. Conversely, where sediments are naturally highly oxic, the farm footprint is more likely to be defined by increased biodiversity and/or benthic productivity.

Therefore, while a conservative approach suggests that the benthic footprint of the proposed facility (the area of seafloor it affects) is likely to be several acres in excess of its 100-acre physical dimensions, and that this area will experience direct physical, chemical, and biological changes as a result of organic enrichment, it remains uncertain how severe these changes may be or if the net result of these changes will substantially reduce the biological productivity of this habitat. The interaction of the particular physical, chemical, and biological variables is difficult to predict in advance, a situation that is heightened by the lack of directly applicable examples from the vicinity of the proposed project or similar open ocean waters. It is likely, however, that the deep waters, moderate currents, and high flushing rates of the project site would cause the deposition of some organic materials, such as the more particulate feces and pseudofeces, to be widely dispersed and poorly concentrated enough to have a limited impact on seafloor conditions.

In addition, to reduce the quantity of organic material that may accumulate on the seafloor below the facility, the Commission is adopting in [Condition 11](#), that KZO refrain from intentionally discharging any biological materials into the ocean. [Condition 12](#) would further limit discharges through implementation of a Debris Management Plan, reviewed and approved by the Executive Director, that includes a detailed description of the maintenance measures that would be taken to ensure that all structures and equipment are kept in working order, thus limiting the accidental breakage or release of cultivation gear and product. To address the remaining uncertainty regarding the impacts of organic enrichment, the Commission is adopting in [Condition 1](#) that KZO develop and submit for Executive Director review and approval, a comprehensive Offshore Mariculture Monitoring Program that includes a study of the seafloor below the aquaculture facility to determine the quantity and composition of materials that accumulate as well as what, if any, effects this accumulation is having on the benthic habitat and biological communities at this site. The Monitoring Program would also include reporting and adaptive management

components to ensure that the Commission remains informed as data and results are gathered and that opportunities for appropriate corrective actions are presented if adverse impacts do occur.

Marine Wildlife

The proposed location of the shellfish farm in the open coastal waters of the Southern California Bight is within an area known to be used on a year-round and/or seasonal basis by a variety of species of marine mammals, sea birds, and sea turtles. Marine mammal species likely to be present at the project site include the California gray whale, blue whale, humpback whale, fin whale, minke whale, California sea lion, harbor seal, Dall's porpoise, Risso's dolphin, Pacific white-sided dolphin, common dolphin, northern right whale dolphin, bottlenose dolphin, harbor seal, and California sea lion, all of which species are also known to spend significant periods of time within California state waters. Two species of sea turtle, the green sea turtle and leatherback sea turtle, also have the potential to be found within the project site, along with 195 species of birds known to occupy coastal and/or offshore aquatic habitats in the Southern California Bight. The November 2005, *Biogeographic Assessment of the Channel Islands National Marine Sanctuary* estimates sea bird diversity in the project area as the highest in the southern half of the state of California.

The proposed project has the potential to adversely affect these whales, sea turtles, and seabirds in the project area in several ways, including through entanglement with the facility, collision with project vessels, and disturbance from operational activities.

Entanglement

Entanglement with ropes, fishing gear and other lines in the ocean is increasingly acknowledged as a significant source of injury and mortality for some marine mammal populations (Kemper and Gibbs 2001; Wursig and Gailey 2002; Kemper et al. 2003; PCCS 2012). Reid et al. (2006) estimate that entanglement in fishing gear results in the death of some 300,000 marine mammals per year and research carried out by the Provincetown Center for Coastal Studies suggests that at least 72% of the right whales in the North Atlantic have encountered entangling ropes in the ocean, as determined through photographic studies of their scars and entangled gear. The majority of entangled ropes and lines observed on whales have small diameters – typically less than two inches. Gray whales off the coast of California are also frequently observed entangled in long lines, ropes, and other gear. In fact, gray whales have the highest reported number of entanglements and ship strikes of any large whale species along the west coast of the U.S. (DeAngelis et al. 2012). As a recent example, during the course of several weeks in the spring of 2012, two gray whales were observed to be entangled in long lines near the proposed project area. One of these whales was freed from a tangled mass of lines and buoys offshore of Redondo Beach in Los Angeles County on March 30, 2012, and another was found dead offshore of Long Beach several days after similar rescue attempts failed. The gear recovered in both cases was small diameter long line material but the origin of the material was not conclusively determined.

While Commission staff is aware of no quantitative research that has been carried out in California on the entanglement risk to marine wildlife specifically associated with shellfish aquaculture infrastructure in open coastal waters – likely because of the general lack of aquaculture facilities in California's offshore waters - studies and evaluations from other

locations can be examined for guidance. A variety of these studies suggest that nearshore and open ocean aquaculture facilities – especially those containing large numbers of ropes and lines – can present a risk to marine wildlife due to entanglement. For example, based on recorded marine mammal entanglement in aquaculture gear, the *Stellwagen Bank National Marine Sanctuary Marine Mammal Entanglement Working Group Action Plan*, approved in October of 2004, calls for a complete prohibition on aquaculture activities within the Sanctuary.

In addition, NOAA Technical Memorandum NMFS-OPR-16 (produced from the Marine Aquaculture, Marine Mammals, and Marine Turtles Interactions Workshop held by NOAA in January of 1999) notes that entanglement is a key concern with marine aquaculture facilities, especially shellfish facilities with designs similar to the proposed shellfish farm, due to their reliance on underwater lines, many of which may be small diameter, looped and prone to slack. This Technical Memorandum describes several evaluations of proposed offshore and nearshore shellfish culture facilities in New England that have been carried out by the National Marine Fisheries Service (NMFS). Although the scale of these proposals is typically several orders of magnitude *smaller* than the current shellfish farm, consideration of entanglement risks to marine mammals and sea turtles features prominently. Among these evaluations is a Biological Opinion for a scallop farm in which NMFS concludes that the proposed configuration of aquaculture gear, amount of gear, and amount of water column occupied by gear poses such a high risk of entanglement to right whales that it would jeopardize the species. The scallop farm evaluated in that report was significantly smaller than the currently proposed shellfish farm and did not include as many linear feet of lines or ropes or such dense concentrations of gear. Several examples from overseas also suggest that aquaculture facilities that include lines and ropes held in the water column present an entanglement risk to marine mammals. These examples include the entanglement and death of two Bryde's whales in a mussel spat collection line (a buoyed line held in the water column to recruit naturally occurring mussel larvae) in New Zealand and the entanglement and subsequent rescue of a humpback whale calf in Western Australia that encountered a shellfish crop line (Keeley et al. 2009).

Adding somewhat to these evaluations of the entanglement risk to marine wildlife from open ocean aquaculture facilities are a variety of anecdotal reports of actual mussel cultivation facilities with designs similar to that of the proposed project that have been installed and operated for many years with few if any observed incidents of entanglement. In New Zealand, for example, the entanglement of the Bryde's whales noted above appears to be the only recorded incident despite the fact that over 900 mussel farms are currently in operation along the coast and have been for many years (Lloyd 2003). It must be noted, however, that the applicability of this evidence from New Zealand to the KZO facility is limited due to substantial differences in species assemblages and movement patterns, geographic factors, and the overall lack of mussel farms in New Zealand that are located in open ocean environments far from shore (like the proposed KZO site). The majority of mussel farms in New Zealand are located close to shore within protected bays and sounds, areas with densities and movement patterns of large whale species that are likely very different from those at the proposed KZO site.

Of the very limited number of marine mussel cultivation facilities sited in offshore open coastal waters that are available to consider with regard to entanglement risk, two in the United States warrant discussion. The first farm was developed as a demonstration project by researchers at

the University of New Hampshire and was installed at an open ocean location approximately five miles offshore of the mainland coast of New Hampshire. Although less than one-tenth of the size of KZO's project, this six-acre facility was sited in an area considered to be within the migratory corridor of five whale and sea turtle species (Langan 1998). Accordingly, entanglement risk was carefully evaluated during the permitting and review process and several measures were implemented to minimize potential impacts. During the years it was in operation, no entanglement incidents were recorded at this facility.

The second open ocean farm is a 26-acre facility located offshore of Santa Barbara and is the only open ocean mussel cultivation facility in California³. Although the site characteristics of this facility are very different from those of the proposed KZO site – it is much closer to shore, smaller, and in shallower waters - its design is similar. Anecdotal reports by the operator of this facility suggest that it is located within the migratory pathway of the California gray whale – whales have several times been observed passing in close proximity to it, and its distance from shore is consistent with the expected location of the migration route in this area (Bernard Friedman, personal communication). However, in the several years it has been operational, no recorded incidents of marine mammal entanglement have occurred at this facility. Whether this absence of impacts is due to a design feature of the facility that reduces its entanglement potential, represents a conscious ability of whales to recognize and avoid the facility, or is a sign that such impacts have simply not yet manifested, cannot be conclusively determined based on currently available information.

While the limited number and relevance of these examples from existing farms, as well as the overall lack of documented incidents of marine mammal entanglements in shellfish cultivation facilities, is insufficient to support a conclusion that the KZO facility does not pose a substantial risk of entanglement, these examples do suggest that the level of concern indicated by the growing number of observed marine mammal entanglement events in general may lead to an overestimation of that risk. Accordingly, an accurate assessment of the entanglement risk posed by this project must include an assessment of the size and design of the facility and marine mammal use patterns in the project area.

Lines with slack, open loops, small diameter lines, lines in areas of elevated marine mammal density, and lines that pass through large areas of the ocean surface or water column pose the greatest entanglement risk to marine wildlife. As noted by Keeley et al. (2009):

In general, it appears to be loose, thin lines that pose the greatest entanglement threat to whales and dolphins as evident by reports in both New Zealand and overseas. As such, potential entanglement risks at New Zealand mussel farms are likely to be low, since backbone lines are under considerable tension. Of secondary and more minor concern are long-line crop ropes hung in continuous loops. Although not documented, this looping configuration has the potential to entangle larger whale species using inshore waters (e.g. southern right, Bryde's and humpback whales) due to the animals' girth, long pectoral fins

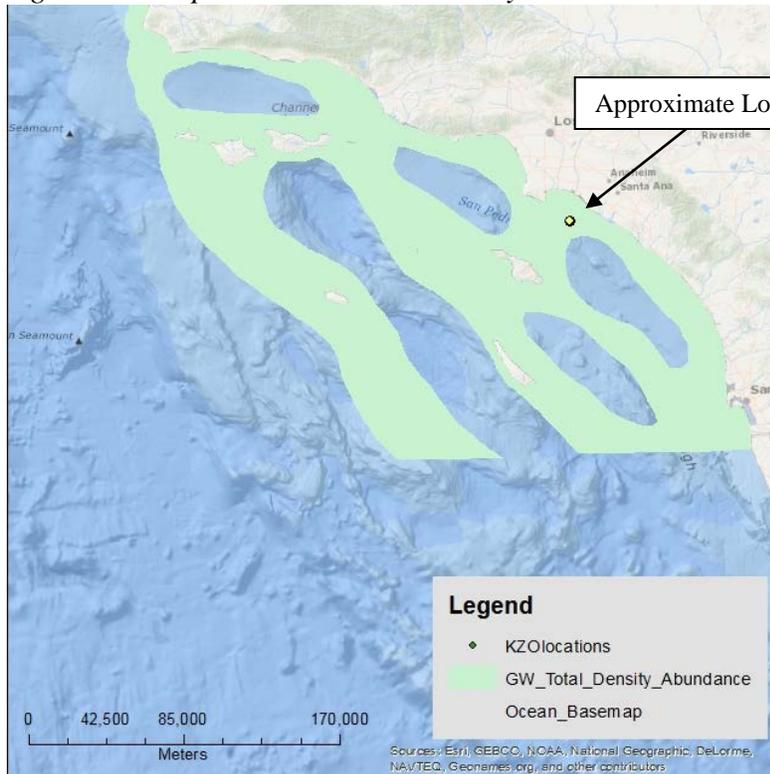
³ This existing facility is in the process of obtaining necessary state and federal authorizations, including an "after-the-fact" coastal development permit, and has undergone only limited environmental review or independent impacts analysis.

and horizontal orientation of their tail flukes (fluke width can be up to half of total body length; for an average right whale, fluke width would be 9 m). Only one incident of a humpback calf in western Australia becoming entangled in a crop line in its mouth has been reported (Coughran 2005). The calf, after having picked up the line in its mouth, panicked and rolled with the line and had to be cut free from its connection to the farm's anchor due to the strong tension on the 20 mm line. Potential entanglement risks in New Zealand mussel farms are likely to be low, based on the lack of loose lines. However, based on overseas evidence, the risk of this occurring would obviously increase if a farm were situated in a historical migratory path.

The proposed project would involve placing well over 40,000 linear feet of rope and cable within the water column (comprised of the 40 lateral longlines and nearly 2,000 attached hanging cultivation ropes and buoy lines). Some of these lines and ropes are proposed to be held taut at approximately 20-feet of depth and spread laterally but many more would radiate towards the seafloor and surface to maintain the “backbone” system in place and support the cultivated shellfish. In particular, approximately 1350 buoy lines would extend 20 to 30 feet from the submerged structure to the surface throughout the proposed 100-acre site and nearly 700 mussel seed ropes would hang approximately ten feet below the structure (before being replaced by the cultivation ropes with their loops that would extend 15 feet below the structure). Overall, the three dimensional footprint of the shellfish cultivation facility over the 100-acre project site would include nearly 2,000 ropes, loops, and lines within the top 30 to 45 feet of the ocean – nearly one third of the water column – as well as 80 anchor lines that would extend from the seafloor to within 20 feet of the surface and the 40 proposed horizontal longlines. The majority of these lines would be comprised of high strength, small diameter, flexible material and would represent an obstacle to the safe transit of marine wildlife – especially large whale species such as blue, fin, gray and humpback whales – through the project site.

Based on data collected by the National Marine Fisheries Service during ship-based and aerial marine mammal surveys of the California coast, the San Pedro Shelf area, including the project site, supports some of California's largest concentrations of humpback, blue, and fin whales. In addition, California gray whales pass through the San Pedro Shelf on both northerly and southerly migrations. Approximately 20,000 of these gray whales migrate through California waters each year between the Gulf of Alaska and breeding lagoons in Baja California. Along much of the west coast, the majority of southbound (November to January) gray whales migrate within two nautical miles of shore, while the northbound migration occurs much closer to shore, with mother and calves reported within kelp beds and sometimes only yards from the shoreline. Within the Southern California Bight (the area from Point Conception to San Diego), however, whales diverge into one of several routes, either remaining close to shore or traveling further offshore between and along the Channel Islands and Catalina – as shown in Figure 2 below (provided to Commission staff by NOAA Fisheries West Coast Region marine mammal biologist Monica DeAngelis). For those whales that remain close to the mainland coast, many move further offshore through the San Pedro Shelf area as they pass the Palos Verdes Peninsula and reconnect to nearshore waters along Orange County. The number of migrating gray whales recorded at long-term monitoring stations on the Palos Verdes Peninsula suggests that as many as several thousand gray whales may transit the San Pedro Shelf and pass near the project area during the southbound and northbound migrations.

Figure 2 – Proposed KZO Site and Gray Whale Presence During Migration



If the proposed project is installed as proposed, foraging behavior, travel, and/or migration of these species through the project site would carry a risk of entanglement in the many lines, ropes, and cables associated with the project. The anticipated number of these entanglement events and the species most likely to be affected are difficult to determine based on available research and the information about the project submitted by KZO. However, as currently proposed, the shellfish farm provides no contingency or protective measures to minimize the occurrence or consequences of such events. While KZO did consider the use of acoustic deterrent devices (underwater noise-makers) as a means of communicating the presence and location of the facility to marine mammals, this approach was abandoned due to the lack of information supporting the effectiveness of such an approach and the potential for such devices to result in further disturbance and displacement of marine mammals.

Based on available research and entanglement records of marine mammals with fishing gear and lines, any loose, hanging, slack, and disconnected lines on the facility would pose a particular risk. As such, the Commission is adopting in [Condition 2](#) that visual inspections of the facility's lines, ropes, anchors, and cultivation equipment are carried out on a monthly basis and that any observed maintenance issues or wear or fatigue of materials is remedied as soon as feasible. In addition, [Condition 2](#) also provides that all lines and equipment are maintained taut and in good working condition and that all observed or suspected entanglement events are recorded and reported to appropriate resource management agency staff for review and consideration. Further, [Condition 4](#) provides that KZO include a qualified marine mammal observer on the project construction/installation vessel and that this observer be authorized to halt operations if marine

wildlife is observed or anticipated to be near a work area and installation activities have the potential to result in injury or entanglement.

Minimization of entanglement risk would also be provided by the Commission in [Conditions 11](#) and [12](#), which prohibit the intentional discharge or release of materials or equipment from the facility, including ropes and lines, and provides for the submittal to the Executive Director for his review and approval, of a Marine Debris Management Plan that includes a description of the extent and frequency of maintenance operations, a description of search and clean-up protocols to be taken in the event of the loss or discharge of materials, and the marking of all project lines and materials with KZO's contact information to facilitate recovery and reporting. As an additional protective measure, the Commission is also providing in [Condition 1](#) that KZO include in its Offshore Mariculture Monitoring Program an evaluation of the response of fish, seabird, and marine mammal populations in the project area to the presence of the facility's infrastructure, biofouling organisms, and cultivated shellfish. This evaluation and the annual reporting of results for the first five years of facility operation will allow for adaptive management measures to be implemented based on the performance of the facility so that any unanticipated issues that arise with regard to marine wildlife entanglement may be appropriately addressed.

Indirect Entanglement

The presence of the shellfish cultivation facility in the project area may also cause indirect entanglement to occur if derelict fishing gear, ropes, lines, or other marine debris accumulates on the facility infrastructure. Both natural and artificial structures in the marine environment accumulate drifting marine debris over time and this material can pose a substantial threat to marine life if it is retained in the environment in such a way as to pose an entanglement risk. For example, abandoned fishing nets have been observed to snag on seafloor features and to remain in place, "fishing" for years afterwards. To address this additional potential source of entanglement, the Commission is providing in [Condition 2](#) that the KZO perform visual inspections of the facility at least once per month and that any derelict fishing gear or marine debris that collects on the facility be removed and disposed of at an appropriate onshore facility. Further, the Commission is also providing in [Condition 8](#) that KZO work with NOAA's Office of Coast Survey to update navigational charts to reflect the final as-built location and configuration of the facility. By ensuring that navigational charts are accurately updated with the project location, accidental interactions between fishermen and the facility will be less likely and the facility will be less likely to snag fishing gear, resulting in its damage and abandonment.

Disturbance from Operational Activities

Depending on the methods used to carry them out, several aspects of KZO's planting, maintenance, and harvest operations have the potential to result in disturbance to marine wildlife. For example, operations requiring the use of artificial night lighting may result in adverse impacts to marine wildlife such as seabirds. Several species of night foraging seabirds are particularly susceptible to attraction by artificial lights, especially in open ocean environments, and may suffer a variety of adverse impacts due to their attraction to and entrapment in the area of artificial illumination. These effects can include exhaustion, separation of parents and young, disorientation and collision with structures, and increased predation due to a loss of concealing darkness. To address this potential source of operational disturbance to marine wildlife and

resulting reductions in marine biological productivity that may result, [Condition 3](#) provides that KZO restrict operations to daylight hours and refrain from night operations and the use of artificial lighting.

Another potential source of disturbance to marine wildlife is the use of active deterrent devices to exclude or displace predatory species that may be attracted to the cultivated shellfish. For example, in many locations mussel farming operators have taken measures to control or eliminate predation by sea ducks, including the use of acoustic harassment devices, water cannons, and other hazing methods. KZO does not proposed to intentionally disturb or harass marine wildlife and would not use any such active deterrent methods.

Ship Strikes

Another potential impact to marine wildlife is collision with project vessels during construction and marine operations associated with the proposed project. KZO proposes to use two vessels to carry out planting, harvest, and maintenance operations - a 110-ton, 75-foot transport and operations vessel and a 14-foot outboard motor powered tender vessel. Both vessels are anticipated to be berthed at the Southern California Marine Institute on Terminal Island in Long Beach, and KZO estimates that each vessel would travel from there to the project site twice per week on average. Travel distance from vessel berth to the facility site is approximately 11.5 miles, which means that four total vessel trips per week would require over 4500 miles of travel through the San Pedro Shelf per year.

Some marine mammal species that have been observed in high numbers in the project area, such as the California gray whale, blue whale, and fin whale, have been shown in recent years to be particularly susceptible to injury and mortality due to collision with marine vessels. Although several of the more recent recorded mortality incidents involving these species and vessel collisions are known or suspected to have been caused by several hundred foot long container ships, smaller vessels similar in size to the project vessels (such as recreational craft, ferries, and whale watching vessels) are also known to have struck and killed or injured marine mammals (International Whaling Commission 2013).

To address this issue, KZO has proposed to train all project vessel operators to observe the following protocols: (a) maximum vessel speed of nine knots; (b) maintenance of a 150 yard separation distance and a prohibition on approaching marine mammals; (c) establishment and use of a designated travel route that transits inside the Long Beach breakwater rather than through the open ocean; (d) use of a designated observer to help spot marine mammals that may be in the vessel route; (e) reduction in vessel speed to five knots and change in course away from any marine mammal observed within a one-mile distance of the vessel; and (f) full stop if a marine mammal is sighted within 0.5 mile until a greater separation distance is observed.

Implementation of these protocols, in addition to the provision in [Condition 4](#) that a qualified marine wildlife observer may halt operations if marine wildlife is potentially at risk, would minimize the potential occurrence of ship strikes during project operations and construction.

Water Column Habitat

Comprised of lines, ropes, buoys, and cultivation equipment held at the ocean surface and within the upper third of the water column throughout the 100-acre project site, the proposed shellfish farm may function as a mid-water artificial reef. Artificial structures in the water column, such

as mussel farms, have been shown to provide foraging habitat, food sources, refuge from predators, and breeding habitat, thus altering the composition and abundance of wild fish assemblages and affecting fish aggregation behavior (Dealteris et al. 2004). Whether the proposed mussel farm is likely to actually contribute to the production of fish populations or simply aggregate fish in the same manner as fish attraction devices (Buckley et al. 1989; Relini et al. 2000; Dempster and Kingsford 2003) is difficult to determine in advance due to the lack of directly comparable facilities within the same region that can be used for reference.

In addition, although some research suggests that marine facilities like the proposed project have the propensity to enhance fish abundances (Dempster et al 2002; Dealteris et al 2004), other studies suggest that assumptions about the ability of artificial structures to constitute effective fish habitat should be made with caution. For example, research by Clynick et al (2008) compared macroinvertebrates and fish found at mussel aquaculture facilities to those in areas of bare sand and found no consistent differences in assemblages and diversity, a finding significantly at odds with previous work. Similarly, a study beneath mussel farms in New Zealand found that sampled farm structures did not support significant numbers of commercially or recreationally important fish (Morrisey et al. 2006 in Keeley et al. 2009) and instead appeared to support fish most commonly associated with areas of unstructured seafloor. As noted by Keeley et al (2009), the variation in these research findings raises an important point; any effects are likely to be site- and region-specific due to the different fish species that may be present, and each species may have unique responses to the type of artificial habitat (Morrisey et al. 2006 in Keeley et al. 2009). The precise effect on wild fish populations is therefore difficult to predict without reference to a comparable scale operation within the project area.

Because available research is ambiguous on the issue of what effect, if any, the proposed project is likely to have on fish and macroinvertebrate populations and communities and there are no comparable projects in the area to use for reference, [Condition 1](#)'s Revised Offshore Mariculture Monitoring Program includes an evaluation of the response of fish and macroinvertebrate populations in the project area to the presence of the facility's infrastructure, biofouling organisms, and cultivated shellfish.

Non-native Species

The proposed shellfish cultivation facility would produce an estimated total of nearly a half-million individual shellfish at harvest every 12 to 18 months. These shellfish, the Mediterranean mussel (*Mytilus galloprovincialis*) and Pacific oyster (*Crasostrea gigas*), are both non-native species believed to have been initially introduced to southern California many years ago. Both species are increasingly understood to have established naturalized, self-sustaining populations outside of cultivation in California. While evidence of the establishment of Pacific oysters outside of cultivation has more recently accumulated, the Mediterranean mussel is believed to have completely replaced and/or hybridized with the native blue mussel (*Mytilus trossulus*) in southern California since the 1900s (Geller 1999). The proposed cultivation of large numbers of these two species in the open ocean has the potential to affect marine resources in several ways: through the filtration and removal of phytoplankton from the water column; through the release of large amounts of potentially viable reproductive material; through the accumulation and release of potentially invasive species, parasites, and pathogens in imported seed materials; and

through the accumulation and growth of invasive fouling organisms on the submerged structure of the cultivation facility.

Filtration

While both mussels and oysters are filter feeders with similar feeding mechanisms, because the majority of the proposed aquaculture facility (38 of 40 proposed longlines) would be dedicated to the cultivation of Mediterranean mussels, this discussion will focus primarily on that species.

Mussel species, including the Mediterranean mussel proposed to be cultivated on the proposed facility, feed primarily on phytoplankton filtered from the water column. With each individual capable of filtering over 20-gallons of seawater per day (Okumus et al 2002), the large concentrations of mussels found in mussel farms can remove a significant proportion of available phytoplankton and particulate matter from the water column in an area, causing localized phytoplankton depletion (Lloyd 2003; Ogilvie et al. 2003). The magnitude and extent of depletion that can occur around mussel farms is not entirely understood but is likely to vary in relation to a variety of factors such as the size and stocking density of the farm as well as season and site characteristics such as water depth, current speed and direction. Research cited by Lloyd (2003) suggests that phytoplankton abundance can be reduced by up to 60% within the boundaries of a mussel farm and that a 123-acre farm is capable of removing more than 20% of the total phytoplankton that passes through it. These filtration effects may be exacerbated by the additional filtration capacity and food demands of filter feeding biofouling organisms that can colonize the submerged structures of an aquaculture facility shortly after its installation (Mazouni et al. 2001).

In addition to the effects that this filtration has on phytoplankton abundance and productivity, the removal of a substantial percentage of phytoplankton within an area may also affect the other species that consume phytoplankton. For example, zooplankton abundance and diversity may be adversely affected by a decrease in the availability of phytoplankton and the abundance of fish that rely on plankton for food may also decline. These declines at the lower levels of the marine food web may trigger shifts that continue into the higher levels as well, affecting the abundance of predatory species as well as the overall productivity of the marine system in the affected area.

Despite the large effects on phytoplankton abundance that mussel farms may have, the area in which these effects manifest has often been found to be relatively limited. For example, Grange and Cole (1997) demonstrated that phytoplankton abundance was unaffected several hundred feet away from an active mussel farm. In addition, some research has shown that the accumulation and release of nutrients such as ammonium into the water column by cultivated shellfish may promote and enhance phytoplankton growth and abundance, thus balancing or minimizing the filtration effects of the shellfish. Given this potential effect, as well as the proposed location of the shellfish farm in an open ocean area characterized by consistent and moderate velocity water movement, a substantial reduction in phytoplankton abundance in the area of the farm is unlikely.

This conclusion is supported by information submitted by KZO, including a report by the consulting firm Longline Environment titled *Application of the Farm Aquaculture Resource Management (FARM) model to offshore aquaculture in Southern California*. However, this

report is only a preliminary general analysis developed “solely to illustrate the approach that might be applied to a more detailed scoping study” and was not developed with input of specific information on the physical characteristics of the project site (current velocity, depth, sediment composition, water quality, plankton abundance, etc.). As such, its results cannot be relied on to form a conclusion about project impacts.

Due to the large number of shellfish proposed to be cultivated and because uncertainty exists around the likelihood and magnitude of this issue, the Commission is adopting [Condition 1](#), which would provide that the Revised Offshore Mariculture Monitoring Program include monitoring and assessment of the filtration effects of the cultivated shellfish on the plankton community at the project site.

Source of reproductive material

Cultivation of large numbers of reproductively viable non-native species in an open marine system may contribute to the proliferation, spread, and persistence of those species outside of cultivation if they are able to release viable eggs, larvae, or other reproductive material. Because both species of shellfish proposed to be grown on the proposed facility are non-native and because invasion of marine systems with non-native species can alter both benthic and pelagic communities of marine species (Carlton 1989; Carlton and Geller 1993; Geller 1996; Cohen and Carlton 1998), the potential for these species to become established and compete with native species should be carefully considered.

Research has shown that the Mediterranean mussel is able to outcompete and displace native mussels and become the dominant mussel species in certain localities. For example, in South Africa, the Mediterranean mussel was introduced in the 1980s and has since successfully invaded the southern coastline and become the dominant species on rocky intertidal shores of the west coast. Studies carried out there suggest that the success of this invasion may be due to the Mediterranean mussel’s ability to grow faster than native mussels, be more tolerant to air exposure, and have a reproductive output that is between 20% and 200% greater than that of native species (Van Erkom Schurink and Griffiths 1993, in Branch and Stephanni 2004).

In California, the Mediterranean mussel was introduced many decades ago and has since become well established. Surveys by Suchanek et al (1997) demonstrate that it is now the most abundant mussel between Tomales Bay in Marin County and San Diego. In addition, research by Geller (1999) suggests that the Mediterranean mussel may have completely replaced the native blue mussel (*Mytilus trossulus*) between Monterey Bay and San Diego. The Mediterranean mussel is therefore clearly capable of establishing and maintaining self-sustaining populations in California waters and has demonstrated several of the common characteristics of an invasive marine species (e.g. an ability to rapidly reproduce and spread outside of its point of origin and whose introduction has caused environmental harm, including the loss or displacement of native species). In fact, the Mediterranean mussel is classified as an invasive species by the California Invasive Species Advisory Council and is included in management efforts by the California Marine Invasive Species Program run by the California Department of Fish and Wildlife and Office of Spill Prevention and Response.

However, given the existing abundance of this species throughout both the project area and the wider southern California region, it is uncertain what effect, if any, the proposed intentional cultivation efforts associated with the project would have. Although the proposed location of the aquaculture facility in open coastal waters over seven miles from the nearest shoreline populations of Mediterranean mussels may introduce a source of reproductive material to current systems and larval transport pathways that are not currently available to the species, it appears that large populations of Mediterranean mussels are already present on the caissons of the offshore oil production platforms only a half mile away from the proposed project site (Los Angeles Times 1994). The water column at the project site is therefore likely to already contain Mediterranean mussel larvae from the oil platforms and the proposed project is therefore unlikely to result in the release of reproductive material for this species in an area in which none currently exists.

Nevertheless, due to the large numbers of this invasive species that are proposed to be grown, the Commission is adopting [Condition 1](#), which would provide that KZO's Revised Offshore Mariculture Monitoring Program include monitoring and evaluation of the production of eggs and larvae from the cultivated non-native species, the regional dispersion of this reproductive material, and its contribution to the regional presence, persistence, and expansion of populations of these non-native species outside of cultivation. KZO must submit the results of these efforts to the Commission on an annual basis for the first five years of the facility's operation, and if they indicate that the release of reproductive material from the Mediterranean mussels at the project site are having unanticipated effects, KZO shall be required to implement adaptive management strategies, project modifications, or operational changes, needed to address these effects.

Contaminated Seed

Historically, shellfish aquaculture operations in California have led to a variety of intentional and unintentional introductions of non-native and invasive marine species. As a recent example with potentially severe consequences, in the 1980s an abalone parasite (sabellid worm) was accidentally introduced to a single farm in California along with a shipment of South African abalone and escaped into the wild. Fortunately, the worm species infestation was discovered at the release point before extensive spread had occurred and a successful eradication was carried out (Culver and Kuris 2000) before it had been transmitted to populations of California abalone with resulting economic and ecological damage. Other previous examples are also available of cases where invasive species were introduced along with shellfish culture materials, including an oyster parasite (*Haplosporidium nelson*) and salt marsh snail (*Batillaria attramentaria*) (National Research Council 2009).

As a result of these introductions, California developed and adopted a variety of regulations to monitor and control the importation of shellfish and culture materials. These regulations limit the importation of biological material and the distribution and planting of shellfish from hatcheries and are primarily managed and implemented by the California Department of Fish and Wildlife. DFW requires that importations of aquaculture materials such as shellfish seed be carried out under an importation permit that assures the import comes from a hatchery or facility certified to be disease and parasite free. KZO has satisfied this requirement and has obtained a long term importation permit establishing that it would purchase and import shellfish seed from

Taylor Mariculture in Washington. KZO's adherence to DFW regulations regarding seed importation would minimize the potential for the project to cause accidental releases or introductions of invasive species, pathogens, or parasites.

Invasive Biofouling Species

Shellfish farms and other artificial structures in marine environments provide a three dimensional habitat for colonization by fouling organisms and associated biota (McKindsey et al. 2006; Costa- Pierce and Bridger 2002). Compared to rocky or soft-substrate benthic habitats, these structures can provide a much larger surface area available for the attachment of biofouling organisms (Keeley et al. 2009). A variety of studies indicate that the dominant organisms on submerged artificial structures includes algae and attached filter-feeding invertebrates such as sea squirts, bryozoans and mussels (Hughes et al. 2005; Braithwaite et al. 2007). These assemblages typically have a range of other non-sessile animals associated with them, such as polychaete worms and various small crustaceans. Based on overseas research, the assemblages that develop on artificial structures can be quite different from those in adjacent rocky areas (Glasby 1999; Connell 2000).

Based on surveys carried out on the submerged structures of the oil platforms located near the project site, a wide variety of invasive marine species are present at these sites, including numerous species known to present significant economic and ecological risk to marine areas along the west coast. Many of these species are known to be "fouling organisms," species of invertebrates and algae that are known to seek out and colonize artificial hard substrate in the marine environment. Maintenance activities for in-water structures and vessels that involve periodic removal of fouling organisms without proper collection and disposal protocols may result in increased dispersal and propagation opportunities for these species. Such opportunities for dispersion and spread pose a particular risk with some algal species and colonial species such as didemnum that may break apart into many pieces when disturbed, each of which may be capable of surviving, growing, and reproducing on its own.

Each of the 40 proposed longline cultivation structures includes roughly 4500 linear feet of lines and ropes as well as over 30 floats and buoys that would be partially or wholly submerged in the water column. These materials attract fouling organisms over time and are proposed to undergo periodic maintenance and cleaning by KZO. Such cleaning and maintenance activities may involve the use of a pressure washer and mechanical scrapers and are proposed to be carried out by divers on the submerged facility or on the surface from a project vessel, with wash water and removed fouling organisms discharged into the ocean. To address the potential risk that this activity would have with regard to the spread and dispersion of invasive marine species, the Commission is adopting [Condition 11](#) which would provide that KZO not intentionally dispose of any equipment or waste, including living or dead shellfish, shells, or non-native fouling organisms into the marine environment. Further, [Condition 11](#) provides that all maintenance cleaning operations of the cultivation facility, including its buoys, ropes, lines, cables, and anchors, be carried out onshore or in a contained manner sufficient to capture all dislodged biological materials. In addition, [Condition 11](#) provides that all non-native fouling organisms and biological materials from non-native organisms removed during cleaning operations be collected and disposed at an appropriate upland facility and that no discharge of untreated wash water or non-native fouling materials occur during maintenance cleaning operations.

Conclusion

With the implementation of the conditions described above, the Commission could find that the proposed project, as conditioned, would be consistent with Coastal Act Sections 30230 and 30231.

G. COMMERCIAL AND RECREATIONAL FISHING

In addition to the commercial fishing protection afforded under Section 30230 of the Coastal Act (quoted above on page 16), Section 30234 and 30234.5 of the Coastal Act state:

Section 30234 of the Coastal Act states:

Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.

Section 30234.5 of the Coastal Act states:

The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

While the design and configuration of the proposed project, especially its location at a depth of between 20 and 30 feet, means that some limited commercial and recreational fishing could be carried out at project site - namely, fishing which makes use of gear capable of remaining near the surface or that would be unlikely to contact or entangle with project lines and ropes - based on input from the fisheries community, Commission staff anticipates that most fishermen would avoid fishing within the 100-acre project site. In letters to Commission staff, both the California Wetfish Producers Association (a commercial fishing industry group largely made up of operators in the squid and sardine fisheries) and the Sportfishing Association of California (a recreational fishing group made up primarily of passenger carrying sportfishing vessel operators) indicated that the installation and operation of the proposed facility would restrict commercial and recreational fishing activities at and around the project site due to the risk of loss and damage to fishing gear and/or catch that would result from contact with the aquaculture structure. These letters are included in **Exhibit 6**. Potential project impacts to commercial and recreational fishing noted in these letters and discussed below include the displacement of fishing activity from fishing grounds and the loss/damage of fishing gear due to accidental contact with the facility.

Displacement from Fishing Grounds

The California Department of Fish and Wildlife has developed a numbered block system to aid in managing fisheries. California's offshore waters are divided into roughly 800 individual 100-square mile blocks used to report where fishing catch and effort occurs. The proposed project

site is within Catch Block 739. Records kept by the California Department of Fish and Wildlife (DFW) over the past five years (2008-2012) for this catch block indicate that it is of particular local, regional, and statewide importance in terms of quantity and value of fisheries. Because the surface and submerged gear associated with the proposed project would interfere with fishing activity, Commission staff expects commercial and recreational fishing activity to be displaced from the project site. The following analysis includes an examination of the amount and likely impact of this displacement on the economic, commercial, and recreational importance of fishing activities.

Commercial Fisheries

Commercial fisheries landings in California have declined dramatically since the 1970s (Hahn and Layne-Farrar 2003), with metric tonnage (mt) falling from 552,559 mt in 1975 to 142,946 mt in 2008 (NOAA Annual Commercial Landing Statistics). Trends in landings in southern California have followed a similar pattern of decline. In addition, in recent years, area closures, marine protection initiatives, discussion of Marine Spatial Planning, and increased interest in renewable energy development (e.g., offshore wind farms, wave energy projects) have heightened the potential for competition for access to commercial fishing grounds. In this context, many commercial fisheries sectors consider any loss or displacement from productive fishing grounds to be a significant adverse impact.

While Catch Block 739 supports several dozen different commercial fisheries, it appears to be of especially key importance to the Pacific sardine and market squid fisheries – two of California’s most economically significant commercial fisheries. The five year average value of Pacific sardine catch from block 739 represents over 17% of the total statewide value of this fishery (with a range of 7% to 35%) and over 30% of the value landed at ports in the Los Angeles area. The market squid fishery in this block represents the largest dollar value – a five year average of over \$2 million – and nearly 4% of the total statewide value of the fishery. Considering that these values are associated with only one of the 800 fisheries management blocks established by DFW, the regional and statewide importance of Catch Block 739 and the San Pedro Shelf area to commercial fisheries is clearly substantial. Although there are numerous commercial fisheries that occur on the San Pedro Shelf, given the economic significance of the squid and sardine fisheries in this area over recent years, as well as the availability of spatial data regarding catch locations and amounts, the following analysis will focus primarily on these fisheries. It is important to note, however, that focusing on potential impacts to fisheries of regional and statewide significance may not adequately capture potential impacts to individual operators of fisheries of more limited economic value.

Despite the importance of Catch Block 739 to commercial fisheries, not all areas within this catch block are of equal importance and value. Fishing is an activity defined by a high degree of variability, and the location in which catch occurs in one year may not be as productive in subsequent years. While it is not possible to accurately predict the precise areas that will yield the most productive fisheries in future years, a spatial examination of fisheries activities averaged over several recent years can provide a general indication of the relative likelihood that a particular area will be important in the future. This approach is typically most accurate on a regional scale and using it here suggests that Catch Block 739 will continue to be an important contributor to the squid and sardine fisheries throughout the San Pedro Shelf region - a fact that

is further supported by the proximity of this Catch Block to several major ports⁴. As shown in the figures included in **Exhibit 7**, the regional importance of Catch Block 739 has remained consistent over the past several years (2010-2012). These figures were provided to Commission staff by the California Department of Fish and Wildlife and represent data collected by DFW on the total weight of catch and reported catch location for the commercial market squid fishery. In the most recent years for which data is available (2010-2012), the catch block that includes the project site consistently provides the highest catch values of the seven catch blocks in the region, between 5,000 and 10,000 short tons (10-20 million pounds). In addition to these figures, DFW directed Commission staff to squid and sardine landing and logbook data products available on its website:

<http://www.dfg.ca.gov/marine/cpshms/pacificsardinelanding.asp>;
<http://www.dfg.ca.gov/marine/cpshms/marketsquidlanding.asp>;
<http://www.dfg.ca.gov/marine/cpshms/logbookdata.asp>

These maps provide information on the relative importance of catch blocks throughout the state, summarized on a monthly or annual basis, for the past 12 to 17 years. This squid and sardine catch data further establishes the importance of the San Pedro Shelf area and Catch Block 739 to these commercial fisheries.

On a smaller scale - within Catch Block 739 – an assessment of the locations in which catch has occurred in recent years also provides an indication of the generally defined areas that may continue to support the most productive fishing activity in the future. This assessment suggests that the proposed 100-acre project site may be less likely to play a key role in commercial fishing activities within Catch Block 739 in the future when compared to other areas. Further, it suggests that the relatively small size of the proposed facility when considered in terms of the overall size of the San Pedro Shelf would further reduce the likelihood and magnitude of the project's impacts to fishing activities. To help demonstrate this concept and aid in Commission staff's analysis, DFW staff contributed a variety of data, including the following table, Table 1.

⁴ While the proximity of the San Pedro Shelf to fishing ports is not responsible for its productivity or value to fisheries, it appears to be a contributing factor, especially for overall quota limited fisheries such as market squid in which operators have an incentive to minimize travel time and distance.

Table 1 - Catch of market squid logbook and CFIS data South of Point Conception (34°30'0"N) and in the San Pedro Channel (Fishing Blocks 718, 719, 739, 740) from the 2000-2001 fishing season to the 2011-2012 fishing season. Logbook catch inside the proposed shellfish farm from the 2000-2001 fishing season to the 2011-2012 fishing season. Closest point column denotes the catch record closest to the proposed shellfish farm for that season in miles (mi). Note: Most of the vessel logbooks have been entered for 2011 and some for 2012.

Fishing Season	Catch South of Pt. Conception		Catch in the San Pedro Channel		Logbook catch inside proposed KZO shellfish farm (Short Tons)	Closest Point (mi)
	Logbook Data	CFIS Data	Logbook Data within blocks 718,719,739,740	CFIS Data Blocks 718,719,739,740		
2000-2001	79,335	113,121	1,147	2,162	0	0.68
2001-2002	75,737	91,081	1,382	1,152	0	1.94
2002-2003	14,265	18,990	380	274	0	4.15
2003-2004	32,826	40,336	514	892	0	1.71
2004-2005	39,686	47,595	0	175	0	22.45
2005-2006	61,669	78,972	6,120	6,224	0	0.72
2006-2007	33,055	37,606	1,430	1,770	0	4.70
2007-2008	46,924	50,347	4,704	4,094	0	1.22
2008-2009	32,956	39,182	284	729	0	2.22
2009-2010	51,473	92,433	522	992	0	2.54
2010-2011	54,709	109,786	4,909	11,185	0	2.02
2011-2012	57,512	117,102	3,805	9,816	0	1.03
Average	48,346	69,713	2,100	3,289	Ave Distance from KZO	3.78

As shown in Table 1, the proposed 100-acre project site is over a half mile away from the nearest location in which commercial squid catch has been reported since 2000 and an average of between two and four miles away⁵.

While this information indicates that the proposed site would be well outside of areas of past fishing activity within Catch Block 739, certain caveats should be considered. At finer scales, there is a high degree of spatial variability inherent in fishing, especially squid fishing which is tied to spawning locations which vary both within seasons and year to year – as shown by the range of proximity values shown in Table 1. This means that even if there is consistency in fishing location between years on a regional level, the location of past fishing activity may not be as useful a predictor of future activity on a local level. In addition, the dataset itself has certain limitations. The data is derived from self-reported logbook and landing information submitted to DFW by fishermen and purchasers. As such, this information cannot be guaranteed to be either 100% comprehensive or accurate. Human error, failures to meet reporting requirement and data quality standards and other factors may contribute to a small number of oversights or errors in the data.

⁵ While the table notes that the average distance is 3.78 miles, this number is strongly influenced by catch data from 2004-2005 that appears to be an outlier. Rejection of this data point yields an average of 2.08 miles.

Despite these caveats, the Commission believes that the data discussed above provide the most robust, quantitative, objective information upon which to base a decision. In particular, the dataset compiled by DFW provides a comprehensive accounting of the market squid commercial fisheries activities in the project area over the past 12 years. The lack of any recorded catch of market squid at the proposed project site (or within a half mile of it) suggests that for this fishery the site has played a limited role in recent years and that it is unlikely to have contributed significantly to overall catch.

Unfortunately, the commercial sardine fishery and others lack the same spatially explicit reporting requirements as the market squid fishery, limiting the ability of Commission staff to carry out the same level of detailed analysis for these other fisheries. To address this, Commission staff drew on the available regional scale data as well as the expertise of the fishing community, as expressed in the letters included in **Exhibit 6**. As noted above, regional data establishes Catch Block 739 as consistently important to commercial fisheries. While information submitted from the commercial fishing community suggests that commercial fishing activity has occurred at the project site in the past, this information lacks the spatial and quantitative detail necessary to determine the relative importance that the site has had to these fisheries in recent years. In addition, no specific observations were provided about the occurrence of commercial sardine fishing at the project site. As such, while the project site may have contributed to commercial fisheries in past years, this contribution appears to have been limited.

However, before reaching a conclusion regarding the proposed project's potential to adversely affect the market squid and sardine/coastal pelagic species fisheries, it is important to understand some basic characteristics of their operations. Both of these commercial fisheries often make use of similar techniques, equipment, and gear – primarily large nets or seines deployed and retracted by skiffs operated in partnership with larger vessels. Once a school of fish or squid has been located and targeted, a seine fishing operation proceeds by deploying a small skiff to encircle the targeted area with the seine. Once encircled, the larger seine vessel hauls in the seine to concentrate the catch (which can weigh in excess of 100 tons and extend several dozen feet into the water column) and then begins to pump the catch from the seine to the vessel.

Due to their size and weight, the process of setting and recovering these nets once full can be time consuming and technically difficult and can often require vessel operators to dedicate complete attention to the task and to have a limited ability to effectively navigate until the full catch is secured safely onboard the vessel. As described in the letter to Commission staff from the California Wetfish Producers Association, attached to this report as **Exhibit 6**, it is common for a seine vessel to drift with the currents during these net recovery operations, sometimes traveling up to three miles with its partially deployed/recovered net extending well below it before regaining full navigational control. As noted in the letter from the California Wetfish Producers Association:

...the 100 acres proposed is the tip of the iceberg. Boundaries of the proposed site must be expanded by at least 2-3 miles on each side to minimize potential impacts from purse seiners drifting into aquaculture long lines during the process of pumping fish from net to boat, with resultant "big mess". The proposed location also interferes with other fisheries,

as fishermen stated at the meeting. Thus actual area off limits to fishing could range as high as 9 square miles.

This means that as a precautionary measure to ensure that a vessel would not drift into the shellfish facility with its catch unsecured and susceptible to damage or loss, commercial seine vessels would not engage in fishing activities within two to three miles of the aquaculture site. Therefore, as noted above, the area in which the squid and sardine fisheries would be restricted from occurring would extend well beyond the boundaries of the proposed facility. Rather than precluding fishing activities within just the 100-acre aquaculture site, these fisheries would instead be precluded from fishing within an area of up to 9-square miles – a much more substantial portion of Catch Block 739.

Although KZO did not take into consideration the location and importance of commercial and recreational fishing activities on the San Pedro Shelf when it initially selected the site of its proposed aquaculture facility, once the issue of fisheries impacts was raised, KZO met with members of the commercial and recreational fishing communities to try to understand their concerns. During the course of this meeting, the fishing community reportedly suggested to KZO's representatives that they pursue a different project site located adjacent to the existing oil platforms on the edge of the San Pedro Shelf. This suggestion was made because seine fishing is already limited in this area due to the presence of the platforms and the risk they may pose to a vessel during catch recovery activities. At the conclusion of this meeting, KZO began to investigate the possibility of installing and operating the proposed facility adjacent to one of the existing platforms. However, it soon learned that U.S. Coast Guard regulations prohibit the passage of any unauthorized vessel within 500 meters of all three oil platforms. In addition, KZO determined that the areas in close proximity to the oil platforms exceeded the target depth range for installation and operation of the facility. KZO therefore selected a new proposed project site located closer to the oil platforms but outside of the 500 meter restricted zone and within its targeted depth range. On December 13, 2013, KZO modified its federal permit and consistency certification to formalize this change.

Although not adjacent to the oil platforms as suggested by the fishing community, the revised project site is located at a distance of roughly a half mile from the nearest platform, Platform Edith. At this location, a nine-square mile area centered at the project site (the maximum potential size of the seine fishing exclusion zone described by the commercial fishing community) would substantially overlap the similarly sized exclusion zone presumed to exist around Platform Edith⁶. Therefore, rather than potentially precluding seine fishing within a 9-square mile area, the revised project site would create a seine fishing exclusion zone of a much more limited 1.2-square miles (in addition to the exclusion areas that already exist around the oil platforms).

This more limited exclusion zone is substantially smaller than the exclusion area that would have been created by the project had it remained in the initially proposed location several miles away from the oil platforms. Additionally and as discussed above, the area around the proposed

⁶ This assumes that the risk to seine boats of drifting into an oil platform precludes them from fishing within a nine-square mile area centered on the platforms as well.

project site, including this new exclusion zone, does not appear to have contributed substantially to commercial fisheries in Catch Block 739 in recent years. The Commission therefore finds that the proposed project would minimize adverse economic impacts to coastal fisheries.

However, in recognition of the spatial variability of fisheries activities and the uncertainty that exists about the likelihood and magnitude of potential impacts to those commercial fisheries about which little data is available, the Commission adopts [Condition 1](#). This condition provides for the evaluation of fisheries activities at and around the project site for the first five years of operation to determine the amount of fisheries activity that is displaced due to the presence of the aquaculture farm and to address any impacts that may occur beyond those anticipated by KZO and discussed in its consistency certification.

Recreational Fisheries

The smaller, lighter, cheaper, and more targeted gear typically used in the recreational fishery, such as hook and line gear, is likely to result in some recreational fishermen continuing to fish at the project site despite the potential risks to their catch and equipment. This is supported by anecdotal reports from New Zealand that suggest that recreational hook and line fishing within and adjacent to mussel farms regularly occurs. In fact, due to the potential of the aquaculture facility to aggregate fish from surrounding areas, there is a possibility that it may enhance catch rates for some species and provide a positive effect for some sectors of the recreational fishing community. However, it is uncertain if these potential benefits would outweigh the potential costs to the recreational fishery of those individuals that avoid the project site or lose/damage gear while fishing on it.

In addition, some sectors of the recreational fishery, such as commercial passenger carrying sportfishing vessel operations that can include larger amounts of equipment and more significant consequences for catch and gear loss and/or damage, are likely to avoid the project site as a precautionary measure. This is supported by input provided to Commission staff from the Sportfishing Association of California (SAC) which notes that the proposed project site is used by operators that would be forced to relocate to other areas if the aquaculture facility were installed. However, the SAC was not able to provide Commission staff with quantitative information regarding the number of operators expected to be affected in this way or the relative importance of the project site to these and other operators in comparison with other sites.

To further understand and evaluate this issue, Commission staff coordinated closely with DFW staff. DFW staff developed and provided a variety of data products to Commission staff to aid its evaluation, including spatial representations of private recreational fishing data and commercial passenger carrying sportfishing vessel (CPFV) data from the project area. Several of these maps are included as **Exhibit 7**, and they demonstrate that in the past eight to ten years, the proposed project site has experienced some of the lowest levels of recreational fishing in the San Pedro Shelf area and Catch Block 739. Robust recreational fishing activities appear to have occurred within several miles of the proposed site – in particular around the existing oil platforms on the edge of the San Pedro Shelf - but much less fishing has been reported from the project site. While this data is informative, it is important to note that it only represents *reported* recreational fishing activity and not *all* recreational fishing activity carried out over this time period. In the professional judgment of DFW staff, the private recreational vessel data represents

approximately 5-10% of the total fishing activity of this sector and the CPFV data represents 2-5%. The result of these low sample values is that while the data can be confidently used to establish locations in which fishing activity has occurred, it cannot so readily be used to determine locations in which fishing activity has been absent.

Recognizing this limitation of the available quantitative recreational fisheries data, Commission staff also considered direct input from the recreational fisheries community itself, primarily through the outreach efforts of the Sportfishing Association of California.

Input provided to Commission staff regarding the project's potential impacts to recreational fishing focused on several of the most popular targeted species, including barred sand bass. Several comments provided to Commission staff noted that the project would adversely affect this sector of the recreational fishery in the area because the proposed site is consistently known to support spawning aggregations of barred sand bass, a sought after resource for fishermen. In addition to concerns that fishing activity would be limited due to the presence of the aquaculture structure and its potential to entangle and damage gear, concerns were also raised about the potential for the placement of an artificial structure in the water column to cause barred sand bass to alter their aggregating behavior and/or abandon the area.

Commission staff reviewed research on the biology of barred sand bass, fisheries management efforts for this species by DFW (including recent and historic surveys and recordings of the location of spawning aggregation sites), and records maintained by DFW on the recorded location of recreational barred sand bass fishing activity. This review did not provide additional support for the concerns raised about this issue. Records of barred sand bass catch and effort, though not 100% complete, did not provide any evidence that the proposed project site has supported barred sand bass aggregations or fishing effort in recent years. In addition, information on the habitat preferences and biology of barred sand bass, including comments provided by Dr. Larry Allen, an experienced biologist and expert on the marine fish of southern California, indicate that this species prefers structured habitat over the relatively homogenous soft substrate habitat that currently exists at the proposed project site. As such, it appears that the concerns raised about potential impacts to the barred sand bass recreational fishery may not be relevant and may have been directed towards the previously proposed site, historic conditions that may have changed, or based on an incomplete understanding of the project site and configuration.

Overall, Commission staff's review of available information regarding recreational fishing in the project area and analysis of project impacts to this fishery suggest that such impacts would be unlikely to occur and/or be limited in nature. However, recognizing the limitations of existing data sources and the spatial variability of recreational fishing, the Commission adopts [Condition 1](#) which provides that KZO, as part of its Revised Offshore Mariculture Monitoring Program, carry out an evaluation of fisheries activities at and around the project site for the first five years of operation to determine the amount of fisheries activity that may be displaced due to the presence of the aquaculture farm and to address any impacts that may occur beyond those anticipated by KZO and discussed in its consistency certification.

Loss/Damage to Gear

Potential adverse impacts to commercial and recreational fishing could also occur due to entanglement of fishing gear with the proposed aquaculture facility. Comprised of ropes, lines, buoys, and cultivation equipment throughout the upper one-third of the water column within the 100-acre project site, the proposed aquaculture facility could snag, catch, damage, or entangle a variety of types of fishing gear, including hook and line gear, trawl gear, nets, and traps. Such gear could come into contact with the facility through intentional deployment, by drifting from surrounding areas, or getting towed or dragged (either from a boat or targeted animal) onto the site during fishing activity. Depending on the nature and duration of this contact, the fishing gear could be lost or recovered in a damaged condition. These gear losses or damages would result in potentially substantial financial losses to the affected fishing operation and potentially lead to the release of marine debris – the unrecovered fishing gear and/or lines or ropes from the facility.

To reduce the potential for accidental loss or damage of fishing gear due to contact with the proposed facility, the Commission is providing in **Condition 8** that KZO facilitate the update of NOAA nautical charts with the accurate location and configuration of the facility. In addition, the Commission adopts [Condition 2](#) to ensure that KZO carry out routine maintenance inspection and repair activities to minimize the number of loose cables, ropes, or materials on the facility that could pose an increased entanglement or snagging risk. Further, [Condition 4](#) provides for the use of a dedicated monitor during construction and installation activities to minimize the potential occurrence of fishing gear and marine mammal entanglement during installation. The Commission also adopts [Condition 12](#) to ensure that a marine debris management and response plan is developed and implemented, thus reducing the potential for project equipment and materials to be released and abandoned into the marine environment where they could adversely impact fishing gear and activities. [Condition 10](#) also provides for the establishment of a removal plan to be implemented if operations or maintenance on the facility ceases, so that it does not become abandoned and derelict. [Condition 9](#) further provides for the creation of a financial instrument to help guarantee that proper site abandonment is carried out. Finally, the Commission also adopts [Condition 7](#) to provide for the development and implementation of a lost/damaged fishing gear compensation program that would allow fishermen to recover costs for any gear damage or loss that occurs.

Conclusion

With the implementation of the conditions described above, the Commission could find that the proposed project, as conditioned, would minimize adverse effects on commercial and recreational fishing and be consistent with Coastal Act Sections 30230, 30234, and 30234.5.

H. ACCESS AND RECREATION

Section 30210 of the Coastal Act states:

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30211 of the Coastal Act states:

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30220 of the Coastal Act states:

Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Water-oriented or ocean-based recreation activities in and around the project area include whale watching, fishing (discussed above in the previous section of this report), sailing, boating, and other similar water sports. The proposed project has the potential to adversely affect coastal access and recreation by restricting water-oriented recreational activities from occurring within the footprint of the facility due to the presence of surface and submerged gear and the risk of possible collision or entanglement.

Preclusion of Vessel Activity

The proposed shellfish cultivation facility would have a surface footprint limited to the approximately 1350 floats and buoys proposed to be used to maintain the cultivation structure at a submerged depth of between 20 and 30 feet. KZO does not propose to restrict the passage of vessel traffic through the project site and anticipates that recreational vessels would be able to pass freely above the proposed structure with little risk of collision or entanglement. The 40 proposed longlines would be installed with a separation distance of approximately 100-feet, allowing passage between lines of buoys. Despite the fact that vessel transit through the proposed site would not be restricted, and that safe passage of all but the largest deep-draft commercial vessels would be accommodated by the project design, some recreational ocean users may avoid the area due to a desire for additional caution. To help ensure that those who may wish to take this approach are not precluded from a larger area than may be necessary, [Condition 8](#) provides for the final location and configuration of the facility to be marked on navigational charts. In addition, KZO would work closely with the U.S. Coast Guard to install marker buoys of proper size and design on the corners of the proposed facility to further demarcate its location to boaters.

While the presence of the facility may redirect some boaters and traffic, the proposed offshore location of the facility – outside of more heavily used nearshore waters – as well as its limited size when compared to the abundance of open water in the project area, would limit any adverse impact on recreational boating that the facility may have.

Conclusion

With the implementation of the conditions described above, the Commission could find that the proposed project, as conditioned, would not restrict or close open ocean waters to recreational boating activities or vessel transit and would be consistent with Coastal Act Sections 30210, 30211, and 30220.

I. OIL SPILLS

Section 30232 of the Coastal Act states:

Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

The proposed project includes the operation of two ocean vessels that could potentially increase the chance of a vessel collision and a release of fuel oil into marine waters during project construction/installation and operational activities. In addition, installation and operational activities also require the use of equipment such as hydraulically powered winches and drilling machines that could fail and discharge oils and hydraulic fluids into marine waters.

The first test of Coastal Act Section 30232 requires an applicant to “protect against the spillage of crude oil, gas, petroleum products, or hazardous substances...” In this case, KZO has incorporated into its project a number of measures that reduce the risk of an oil spill. To avoid the potential for a vessel collision, KZO has sited the proposed facility outside of all known vessel transit routes to and from the ports of Long Beach and Los Angeles and has established a vessel route for its operational vessels between the facility and its home port that avoids other known vessel transit lanes and routes. In addition, [Condition 6](#) provides that KZO will submit, for Executive Director review and approval, a Spill Prevention and Response plan that includes measures to minimize the likelihood of a hazardous material spill. Such measures include the use of vegetable based hydraulic fluid in project equipment in place of more hazardous fluids; the use a dedicated support boat during facility installation/construction activities to help direct non-project vessels away from areas of active construction; and a prohibition on at-sea vessel or equipment fueling/refueling activities.

With the implementation of [Condition 6](#), the Commission finds that KZO would be undertaking appropriate measures to prevent a spill from occurring and therefore the project is consistent with the first test of Coastal Act Section 30232.

Notwithstanding implementation of the above-described prevention measures, accidental spills can and do occur. The second test of Section 30232 requires that effective containment and cleanup facilities and procedures be provided for accidental spills that do occur. To meet this test the Commission typically requires an applicant to submit an oil spill contingency plan that demonstrates that the applicant has sufficient oil spill response equipment and trained personnel to contain and recover a reasonable worst case oil spill, and to restore the coastal and marine resources at risk from a potential oil spill.

Because neither of these requirements have been met, [Condition 6](#) would also provide that KZO submit, for Executive Director review and approval, a Spill Prevention and Response Plan that includes identification of potential spill sources and quantity estimates of a project specific reasonable worst case spill; identification of prevention and response equipment and measures/procedures that will be taken to prevent potential spills and to protect marine and

shoreline resources in the event of a spill; the provision of spill prevention and response equipment onboard project vessels at all times; and emergency response and notification procedures, including a list of contacts to call in the event of a spill.

With implementation of [Condition 6](#), the Commission finds that KZO would be undertaking appropriate measures to effectively contain and respond to accidental spills that may occur and therefore the project is consistent with the second test of Coastal Act Section 30232.

Appendix A
Substantive File Documents

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Adopted Findings for Coastal Development Permit E-11-017

Letter to Commission staff from the California Wetfish Producers Association dated December 16, 2013.

Letter to Commission staff from the California Wetfish Producers Association dated September 24, 2013.

Letter to Commission staff from the Sportfishing Association of California dated April 24, 2013.

Letter to Commission staff from Dr. Larry G. Allen dated November 7, 2013.

Consistency Certification and supplementary letters, reports, and materials submitted by KZO, included in file no. CC-035-12.

EXHIBIT 1 – Project Location

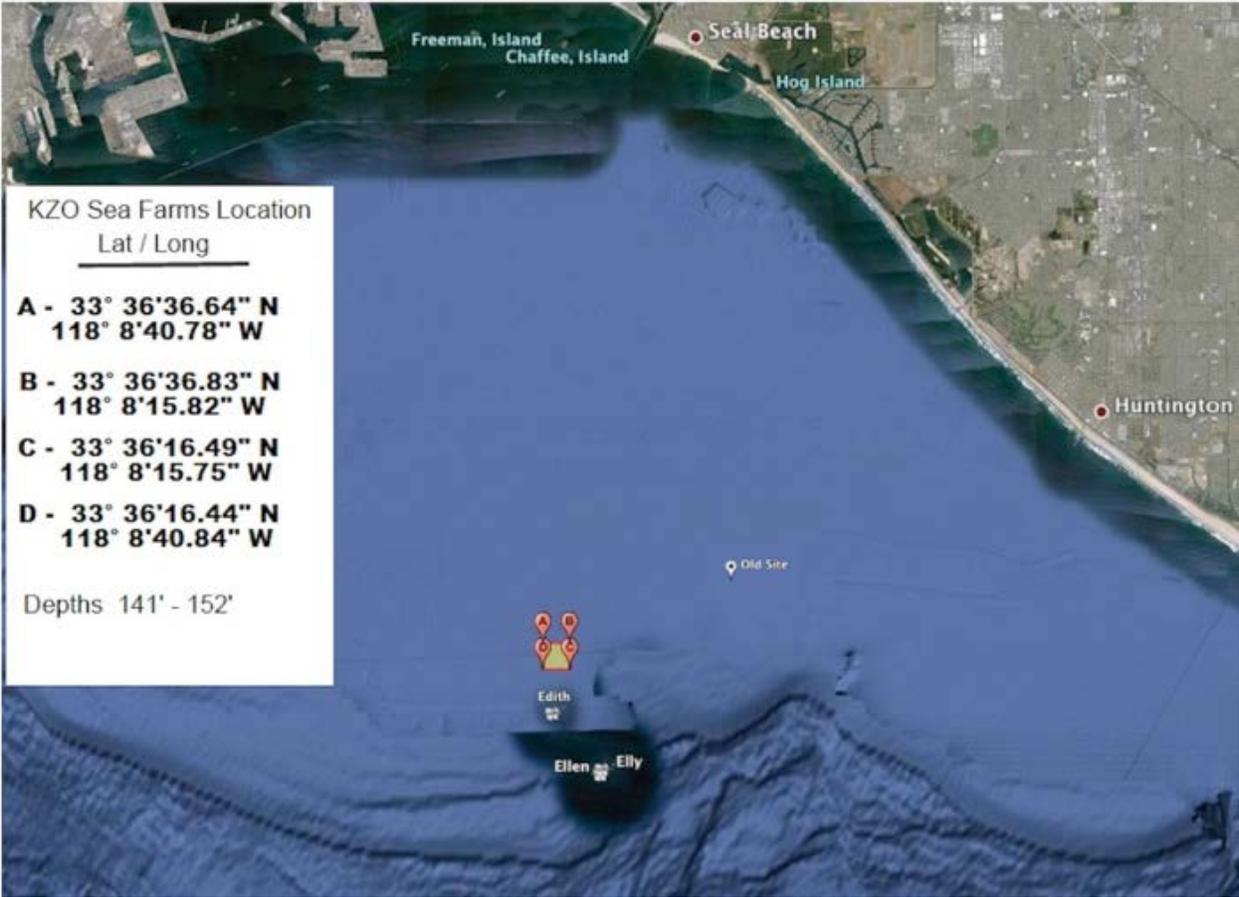
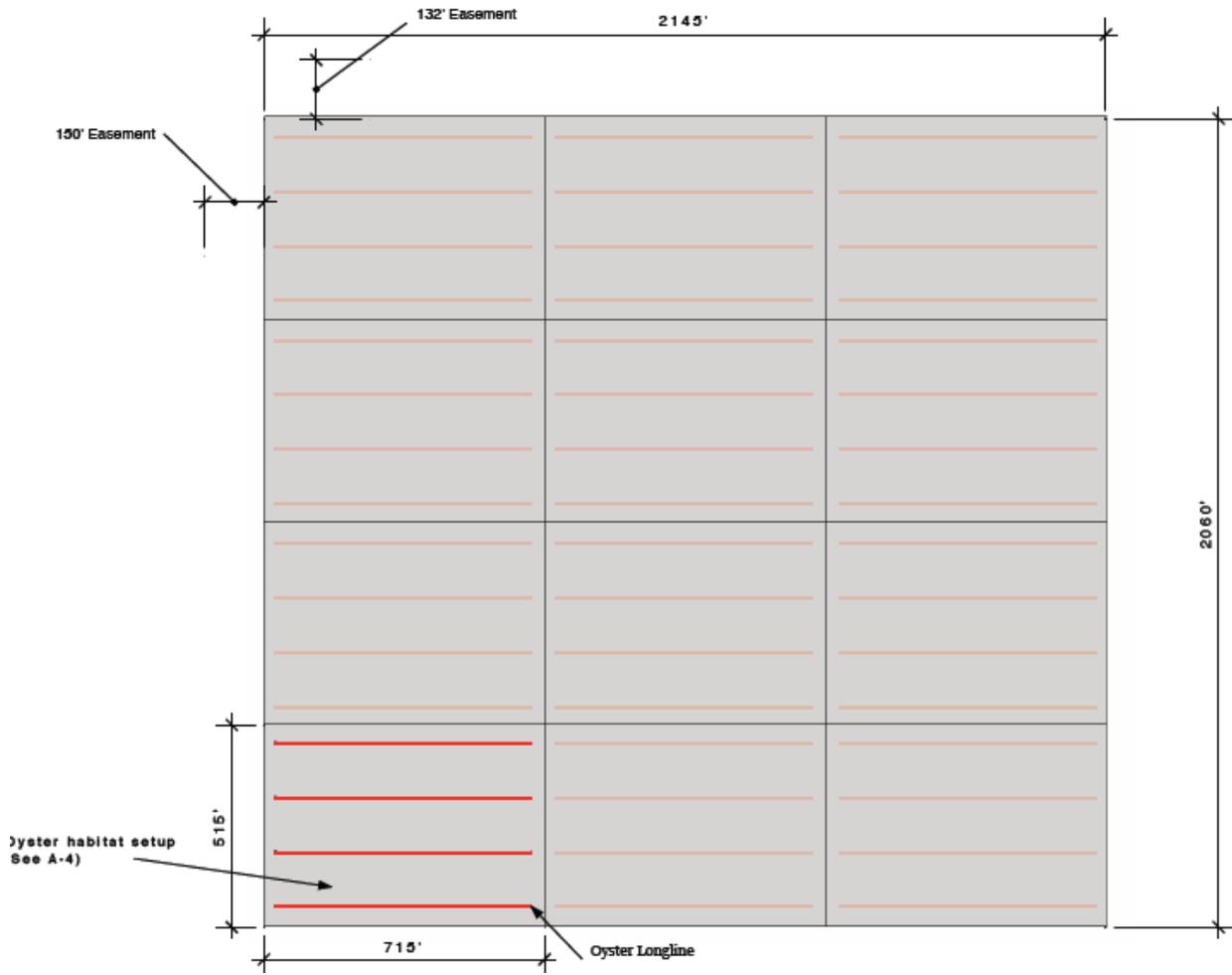


EXHIBIT 2 - Schematic Diagrams of Proposed Facility



Perspective Section of
1 acre pad



EXHIBIT 3 – Diagram of Oyster Cultivation Trays

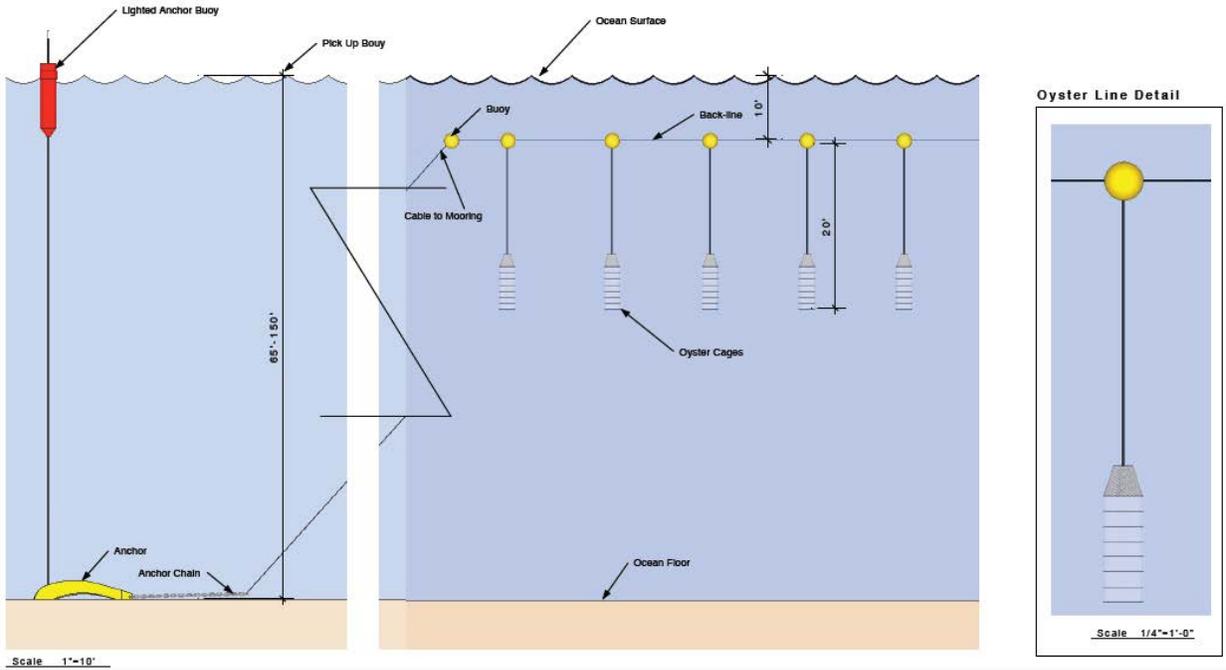


EXHIBIT 4 – Diagram of Mussel Cultivation Ropes

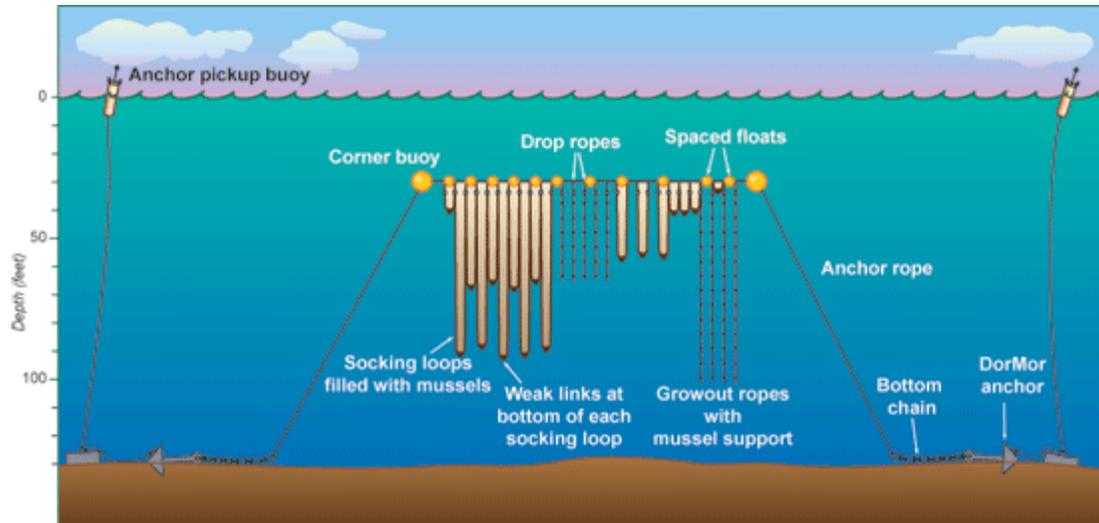


EXHIBIT 5 -National Marine Fisheries Comment Letter



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

MAY = 3 2012

Colonel Mark Toy
U.S. Army Corps of Engineers
Los Angeles District
Attn: Daniel P. Swenson
P.O. Box 532711
Los Angeles, California 90053-2325

Dear Colonel Toy:

NOAA's National Marine Fisheries Service (NMFS) has reviewed the U.S. Army Corps of Engineers' (Corps) Public Notice (PN) (SPL-2012-00042-DPS) regarding KZO Sea Farms' proposed mariculture project off the San Pedro shelf of California. In addition, we have reviewed the Essential Fish Habitat Assessment provided via email on March 16, 2012, by the project proponent.

Proposed Project

KZO Sea Farms (KZO) plans to develop an open ocean shellfish farm in federally regulated waters of the United States. The project area will be developed with 45 longlines on 100 acres located approximately 7 miles from the shoreline in the San Pedro Basin, offshore Long Beach, California and 3.1 miles northeast of oil platform Edith. The longlines are 500 feet in length spaced 100 feet apart and anchored on each side to the ocean floor in depths of approximately 110 to 150 feet. Buoys will suspend the backbone longline about 20 feet under the water surface which will have a series of hanging nets containing shellfish and ropes with attached mussels and kelp. Each longline will be marked with Coast Guard approved lighted anchor buoys.

The longline components include 750 feet of 1-inch poly-blue steel rope and 28 16-inch polyethylene floats. The oyster longlines will suspend 60 5-level lantern nets and the mussel longlines will consist of 1,800 feet of looped fuzzy rope. There will be four species of shellfish and one species of kelp cultivated: Olympia oyster (*Ostrea lurida*), Pacific oyster (*Crassostrea gigas*), Mediterranean mussel (*Mytilus galloprovincialis*), rock scallop (*Hinnites multirugosus*) and giant kelp (*Macrocystis pyrifera*). Olympia oyster, rock scallop, and giant kelp are native species. The Mediterranean mussel is non-native, but is now a prolific component of hard substrate along the Southern California coastline. The Pacific oyster is also non-native and is becoming increasingly more common to Southern California's bays and estuaries.

General Comments

The proposed project has the potential to meet many of NOAA's aquaculture goals and objectives as outlined in both the Department of Commerce and NOAA's National Marine Aquaculture policies issued in June 2011. These policies encourage and foster development of sustainable marine aquaculture in the context of NOAA's multiple stewardship missions, and social and economic goals, reaffirming that aquaculture is a key component of NOAA's efforts to maintain and protect healthy and productive marine ecosystems, as well as balance competing uses of the marine environment. NOAA's goals include developing sustainable marine aquaculture that provides domestic jobs, increases safe and domestically



produced seafood products, and that is in harmony with other sustainable uses of the ocean. Approximately 84 percent of seafood consumed in the United States is imported, half of which comes from aquaculture operations outside the United States. Seafood demand is continually increasing, owing to the multiple health benefits provided from seafood consumption. Current domestic aquaculture production only provides about 5 percent of seafood consumed in the United States and does not meet current product demand. Also in June 2011, NOAA issued a National Shellfish Initiative, which recognizes the ecosystem benefits of shellfish production and restoration, and seeks to stimulate coastal economies through increasing sustainable commercial shellfish production while improving ecosystem health in our nation's waters. The National Shellfish Initiative focuses on, in collaboration with public and private partners, spatial planning and efficient permitting, research on environmental and habitat effects, technologies and methods for shellfish restoration and farming, and coordinated and innovative financing. The proposed project is responsive to these policy and initiative goals, potentially increasing availability of domestically produced safe shellfish products in a manner that may provide beneficial ecosystem services associated with shellfish farming, generate new jobs, and further research regarding offshore aquaculture by serving as a unique demonstration project that, with appropriate monitoring, can provide data regarding offshore shellfish operations. Our comments below address a procedural issue and the potential effects of the proposed action. They are provided pursuant to our responsibilities under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), Endangered Species Act (ESA), Marine Mammal and Protection Act (MMPA), and the Fish and Wildlife Coordination Act (FWCA).

Procedural Comment

According to the PN, a permit will be issued, issued with special conditions, or denied under Section 10 of the Rivers and Harbors Act of 1899 (RHA). No reference is made to Section 404 of the Clean Water Act (CWA). Few shellfish culture permits have been issued by the Corps in California. The Corps San Francisco District processed an individual permit for the Coast Seafoods project in Humboldt Bay pursuant to the provisions of Section 10 of the RHA and Section 404 of the CWA. NMFS requests an explanation as to why Section 404 of the CWA was invoked for the Humboldt Bay project, but is not being invoked for the proposed KZO Sea Farms project.

Magnuson-Stevens Fishery Conservation and Management Act Comments

Comments Regarding Potential Impacts To Federal Fisheries

The project site is located within an area where commercial and recreational (both private and charter boats) fishing occurs on species managed under federal fishery management plans (FMPs).

Coastal Pelagic Species FMP: Market squid, sardine, and anchovies are commercially harvested by purse seiners in the project area.

Pacific Groundfish FMP: Recreational fishing for Pacific sand dab occurs in the project area.

If the project is permitted, fishing access would be restricted in full or part in the project area and could possibly displace fishing activity to other areas. It is recommended that these local fishing stakeholders be engaged to find out how the project could economically impact their activities and to identify any concerns they may have, including concerns about new fishing areas they would utilize to compensate for the lost area and impacts to those areas. Additionally, potential actions should be explored to address issues identified.

Essential Fish Habitat Comments

Action Area

The proposed project occurs within essential fish habitat (EFH) for various federally managed fish species within Coastal Pelagic Species, Highly Migratory Species, and Pacific Coast Groundfish FMPs. In addition, the project occurs within the vicinity of rocky reef habitat, which is designated as a habitat area of particular concern (HAPC) for various federally managed fish species within the Pacific Groundfish FMP. HAPC are described in the regulations as subsets of EFH which are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under MSA; however, federal projects with potential adverse impacts to HAPC will be more carefully scrutinized during the consultation process.

As described in the EFH Assessment, the project area is located on the outer edge of the San Pedro Shelf in habitat described as uniform silty sand or sandy silt with occasional rocky outcrops. Using United States Geologic Survey multibeam data, the EFH Assessment concluded that the primary bottom type of the project area is approximately 70% sand and 30% mud. The analysis concluded that the nearest potential rock occurs over 1,000 feet to the east of Platform Edith. Although NMFS believes the geophysical survey data is instrumental in guiding the siting of the project to avoid significant and obvious rocky reef features, limitations of the data may preclude conclusive determinations regarding the presence of localized rock outcrops or the development of biogenic habitat. For these reasons, visual surveys should accompany the geophysical survey to determine whether sensitive habitats may exist in the project area - a practice often used for actions related to oil development activities.

Effects of the Action

Effects to EFH from the proposed project include: 1) mechanical disturbance to benthic habitat, 2) biodeposition, 3) provision of structural habitat, and 4) filtration. NMFS does not concur with the EFH Assessment's introductory statement that bivalve shellfish aquaculture has no environmental impact, but recognizes that properly sited shellfish operations utilizing native species generally have the least negative impacts of marine aquaculture practices and may also provide positive ecosystem functions.

Soft bottom habitat will be adversely affected by direct, mechanical disturbance of sediment by the anchor units. Each anchor is approximately 300 pounds, comprised of a 3-foot fluke, and a 4 foot long shank that is attached to a 5 foot steel chain. Based upon these dimensions, the six square foot estimate provided in the EFH Assessment is likely an underestimate. NMFS expects the anchor chain to move in response to load stress, which will disturb a larger footprint. As a rough calculation, NMFS assumes a circular impact with a radius of five feet (the length of the anchor chain) which amounts to a 78.5 square foot impact. Accounting for 90 anchor units, the project would impact approximately 0.016 acres of soft bottom habitat. Given the ubiquitous nature of this habitat type in the offshore environment and the relatively low risk of cumulative impact from coastal development, NMFS believes this would be a minimal adverse effect to EFH.

The cultured shellfish will transform pelagic production into benthic production through the removal of water column nutrients and subsequent deposition of feces and pseudofeces to the sediment. This biodeposition has the potential to enrich the benthic habitat with additional nutrients beyond what would naturally occur. In low to moderate amounts, this has the potential to have a positive impact as mild enrichment may increase the abundance and diversity of benthic invertebrates. However, excessive nutrient enrichment may degrade the quality of benthic habitat. The EFH Assessment includes the results of a modelling effort that analyzed the loading of feces and pseudofeces to the sediment. Based upon the

EXHIBIT 5 -National Marine Fisheries Comment Letter

results, it appears that benthic loading will be minimal and is, thus, not expected to have a substantial impact to EFH. Subsequent monitoring would inform the degree of impact.

NMFS recognizes that the structure provided by the cultured species and associated apparatus may provide some degree of structural habitat value. The EFH Assessment suggests that this project will also provide ecological performance for encouraging the recovery of fish populations. Given that the proposed structures will not be permanent and will be subject to a repeated cycle of planting and harvest, NMFS believes that the function provided by the introduced structure may likely be limited to fish attraction, rather than fishery production. However, this is difficult to determine with any certainty based upon available information.

Although hard structure is often seen as a positive habitat component, the novel structures and/or the cultured species themselves may serve to facilitate establishment and/or proliferation of non-native species. The Pacific oyster is a non-native species that appears to have established a self-sustaining population in various embayments in Southern California. The risk of further proliferation of this species is yet to be determined. Ruesink *et al.* (2005, 2006) provide some perspectives on the ecological implications of introducing non-native oysters. Hilbish *et al.* (2010) suggest that *M. galloprovincialis* is both ecologically invasive and a source of 'genetic pollution' that may threaten the genetic integrity of a native mussel species over much of its geographic range. At this time, NMFS is unaware of formal risk and/or impact assessments that have been conducted for these non-native species and does not have sufficient information to make a conclusive determination regarding the potential risk these species have to the local ecosystem. In addition, other non-native species may be attracted to the novel hard substratum provided by the proposed project. For example, the invasive clonal tunicate, *Didemnum vexillum*, is known to colonize oyster culture structures in California embayments (*e.g.*, Drakes Bay). However, NMFS expects that the offshore nature of the project likely poses a low risk for proliferation of non-native species as much of the scientific evidence linking non-native species associations to novel hard substrate occurs within embayments rather than the offshore environment (Glasby *et al.* 2007, Wasson *et al.* 2005, Tyrell and Byers, 2007). Subsequent monitoring of non-native fouling organisms may inform the degree to which this poses an environmental threat.

The EFH Assessment indicates that the proposed project will have a beneficial impact via the filtration function provided by the shellfish. NMFS concurs that this may have a beneficial impact, but only to the extent the project area suffers from eutrophication and/or harmful algal blooms. In this case, the primary nutrient source is likely to be from upwelling rather than land discharges. NMFS notes that the nutrients provided by coastal upwelling are critical to the California Current ecosystem and support a large number of federally managed fish species. The EFH Assessment includes a modelling effort that indicates very minor food depletion in the central section of the farm. Given this and the relatively small size of the proposed project area within the San Pedro shelf environment, NMFS does not expect substantial reductions in habitat quality from the proposed action. However, NMFS believes a more rigorous examination of the filtration effects should be conducted if this operation were to seek expansion.

The EFH Assessment indicated that the project will be rigorously monitored and quarterly reports will be available for regulatory agencies and the public. Specifically, the monitoring will consist of a threefold program conducted by highly qualified scientists and environmental firms. However, two of three components of the monitoring effort involve modeling efforts. The third component relies upon monitoring conducted by NOAA NMFS Milford Laboratory. NMFS has interest in partnering on the monitoring effort and this monitoring project is a top priority for the Milford Laboratory, but one that is subject to fiscal uncertainty. Therefore, the applicant is ultimately responsible for implementation of an adequate monitoring program for this project. That being said, NMFS will continue to explore partnering opportunities.

EFH Adverse Effect Determination

NMFS has determined that the proposed project would adversely affect EFH for various federally managed fish species under the Coastal Pelagic Species, Highly Migratory Species, and Pacific Groundfish Fishery Management Plans. The anchoring mechanisms would adversely affect benthic habitat via direct, physical disturbance. Given the relatively small footprint and the apparent lack of sensitive habitat, NMFS believes this to be a minimal impact. The proposed project has the potential to cause localized nutrient enrichment via deposition of shellfish feces and pseudofeces. However, based upon preliminary modeling, NMFS expects such benthic impacts would be minimal. The proposed project may result in the localized reduction of plankton communities. Based upon the information provided, NMFS does not expect this to have a substantial impact on foraging. Lastly, the proposed project has the potential to facilitate additional proliferation of non-native species in coastal habitats. However, due to the offshore nature of this project and the species involved, NMFS believes the risk posed by this project to native diversity in coastal habitats is likely low.

EFH Conservation Recommendations

As described in the above effects analysis, NMFS has determined that the proposed action would adversely affect EFH for various federally managed fish species within the Coastal Pelagic Species, Highly Migratory Species, and Pacific Coast Groundfish FMPs. Therefore, pursuant to section 305(b)(4)(A) of the MSA, NMFS offers the following EFH conservation recommendations to avoid, minimize, mitigate, or otherwise offset the adverse effects to EFH.

1. NMFS' determination that the proposed project would have only minimal adverse impacts is based upon a number of assumptions that should be evaluated with project-specific monitoring. Therefore, prior to construction, the applicant should provide the Corps and NMFS a detailed monitoring plan that outlines the methodologies used to assess the above effects. Construction should not begin until the Corps has approved, in consultation with NMFS, the monitoring plan. Upon approval, the monitoring plan should then be implemented to demonstrate the degree of impact associated with the proposed project. Results from the monitoring may then inform whether adaptive management actions are necessary.
2. The EFH Assessment indicates the applicant will employ deployment methods for anchors and chains to avoid hard bottom substrate and/or biogenic habitat. However, these methods are not described in the EFH Assessment. Prior to construction, the applicant should provide the Corps and NMFS a hard bottom avoidance plan. Construction should not begin until the Corps has approved, in consultation with NMFS, the hard bottom avoidance plan. Upon approval, the plan should be implemented to avoid any adverse impacts to hard bottom communities.

Statutory Response Requirement

Please be advised that regulations at section 305(b)(4)(B) of the MSA and 50 CFR 600.920(k) of the MSA require your office to provide a written response to this letter within 30 days of its receipt and at least 10 days prior to final approval of the action. A preliminary response is acceptable if final action cannot be completed within 30 days. Your final response must include a description of measures to be required to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH conservation recommendations, you must provide an explanation of the reasons for not implementing those recommendations. The reasons must include the scientific justification for any disagreements over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects.

Supplemental Consultation

Pursuant to 50 CFR 600.920(l), the Corps must reinitiate EFH consultation with NMFS if the proposed action is substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for NMFS' EFH conservation recommendations.

Fish and Wildlife Coordination Act Comments

The purpose of the FWCA is to ensure that wildlife conservation receives equal consideration, and is coordinated with other aspects of water resources development [16 U.S.C. 661]. The FWCA establishes a consultation requirement for Federal departments and agencies that undertake any action that proposes to modify any stream or other body of water for any purpose, including navigation and drainage [16 U.S.C 662(a)]. Consistent with this consultation requirement, NMFS provides recommendations and comments to Federal action agencies for the purpose of conserving fish and wildlife resources. The FWCA allows the opportunity to offer recommendations for the conservation of species and habitats beyond those currently managed under the MSA. NMFS has determined that coastal habitat may be negatively impacted by proposed project activities. As such, the EFH Conservation Recommendations provided above also serve as a FWCA recommendations to address these negative impacts.

Endangered Species Act Comments

Section 7 of the Endangered Species Act (ESA; see 16 U.S.C. § 1536(a)(2)) requires Federal agencies to consult with the Secretary of Commerce to insure that "any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species . . ." See also 50 C.F.R. part 400. On page 3 of the PN, the Corps makes a determination that the proposed project would have not affect federally-listed endangered or threatened species, or their critical habitat. Please note that the Corps should formally request concurrence from NMFS regarding any effects determination of possible impacts to those ESA-listed species under NMFS' jurisdiction.

ESA-listed marine mammal species likely to be present at the project site include: the blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), and fin whale (*B. physalus*). The sperm whale (*Physeter macrocephalus*) and Guadalupe fur seal (*Arctocephalus townsendii*) may also be present, but occurrences would be rare. Although there is little research on the specific entanglement risk to marine mammals from shellfish infrastructure in open coastal waters, evaluations from other areas (Stellwagen Bank National Marine Sanctuary Marine Mammal Entanglement Working Group Action Plan, October 2004; NOAA Technical Memorandum NMFS-OPR-16, January 1999) suggest that nearshore and open ocean aquaculture facilities, particularly those containing ropes and lines, could present a risk to marine mammals due to entanglement. For detailed information about marine mammals, please see the MMPA comments section below.

In addition to ESA-listed and protected marine mammals that may be in the project area and may be at risk of entanglement, leatherback sea turtles (*Dermochelys coriacea*), while rare south of Point Conception, have been documented entangled in fixed gear (sablefish pot gear off central California) and in kelp, off Point Loma in San Diego County. Similar to humpback whales, leatherbacks have front flippers that are proportionately larger when compared to similar species, which may make them more vulnerable. While the interaction with the fixed fishing gear resulted in a mortality, the animal entangled in kelp was successfully disentangled by a nearby diver/fisherman.

Marine Mammal Protection Act Comments

NMFS Southwest Regional Office staff met with Phil Cruver on March 27, 2012, to discuss the project, clarify some inconsistencies in the project description and processes, discuss the analyses, and understand the proposed structure of the aquaculture farm. Staff from the Protected Resources Division discussed the potential risk of the project with marine mammals and offered to share information regarding historical entanglements and past studies.

All marine mammals are protected under the MMPA. Under the MMPA, it is illegal to "take" a marine mammal without prior authorization from NMFS. "Take" is defined as harassing, hunting, capturing, or killing, or attempting to harass, hunt, capture, or kill any marine mammal. "Harassment" is defined as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. If this project is permitted, this will be considered an active commercial fishery and will be subject to the requirements under section 118 of the MMPA. Please see the following link for the List of Fisheries: <http://www.nmfs.noaa.gov/pr/interactions/lof/>.

In addition to the ESA-listed marine mammal species identified under the ESA section above, non-ESA-listed marine mammal species likely to be in the project area are: the gray whale (*Eschrichtius robustus*), minke whale (*B. acutorostrata*), California sea lion (*Zalophus californianus*), Pacific harbor seal (*Phoca vitulina richardii*), Dall's porpoise (*Phocoenoides dalli*), Risso's dolphin (*Grampus griseus*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), common dolphin (*Delphinus delphis*; more than likely the long-beaked common dolphin would be in the project area, but there is a possibility that the short-beaked common dolphin (*D. capensis*) could also transit this area), northern right whale dolphin (*Lissodelphis borealis*), and bottlenose dolphin (*Tursiops truncatus*).

For over 20 years, NMFS has been receiving reports of entangled large whales in gear, but with limited ability to identify the origin of the entangling gear. Often, the animals have been seriously injured or killed due to the interaction. These reports come from other government agencies, researchers, volunteers working for stranding networks, fishermen, and the general public.

In California, Oregon, and Washington, humpback and gray whales were the most frequently entangled cetaceans: forty-two humpback whales and thirty-seven gray whales, from 2000 to 2010. During this time period, 27% of entanglements were classified as net gear, 43% as pot/trap gear, and 30% is unknown gear. In unknown cases where only line was noted on the whale, it was difficult to determine whether the line belonged to a trap, net, other commercial fishing source, or non-commercial fishing source without further physical description of that line.

There are many factors that preclude identification of the gear on an entangled large whale both in and out of the water: 1) location, attachment point, of the gear on the animal; 2) weather and sea state; 3) entanglements consisting of generic gear (i.e., 3/4" polypropylene line) used for multiple purposes including fishing, preventing identification to a specific fishery; 4) lack of information regarding the kind of fishing gear that is used by a particular fishery; 5) lack of familiarity of the reporting party with how to document the entanglement and not recording the correct information; and, 6) lack of appropriate documentation (photos or video) of the entangled whale for assessment by experienced personnel.

Vertical lines present in the ocean can entangle large whales. This was explored on the U.S. east coast in Johnson *et. al.* (2005) who reviewed 61 entanglement cases involving right whales and humpback whales and reported: "Fifty-six percent of the entanglements for both species involved buoy line, providing evidence that buoy lines present entanglement risk regardless of line type. Sinking (all or part) buoy line

was found on more entangled animals than floating buoy line, which may indicate that sinking buoy line creates more entanglement risk than floating buoy line. However, it is possible that the gear observed on or removed from an animal may not accurately reflect the entire history of an entanglement, since some or all gear can be shed by the whale, lost during disentanglement, or change position over time.”

The entanglement risk of line material (i.e. floating/sinking line, nylon vs. polypropylene), thickness of line, and line orientation (vertical versus ground line) is under investigation. The Consortium for Wildlife Bycatch Reduction program (<http://bycatch.org>) states that one reason for the increase in U.S. east coast large whale serious injury from entanglements may be the increase in breaking strength of the ropes used by the fisheries. Amy Knowlton’s study (New England Aquarium) found that today’s ropes are at least 30% stronger and three times more abrasion resistant than older lines. Therefore, the addition of high breaking strength vertical lines for an aquaculture facility in an area where whales are present, represents an elevated entanglement risk.

Co-occurrence of aquaculture project, large whales, and commercial fishing

The proposed aquaculture project overlaps with both large whale and commercial fishing presence (see attached maps).

Whales (Maps 1-10)

The primary concern would be for blue whales from July to November and for gray whales from January to May. Gray whales migrate annually from their Arctic summer feeding ground to winter breeding grounds in Baja California, Mexico using a migration corridor within 10 km of most of the U.S. west coast with some variation around the offshore islands of southern California. There has never been a documented report of a blue whale entanglement along the U.S. west coast despite their dense seasonal presence at their summer feeding grounds off southern California. However, just because an entanglement has not been observed, does not mean that they do not occur. The proposed project also overlaps with summer presence of fin and humpback whales.

Data sources: Becker et al., in prep and DeAngelis et al., in prep.

Commercial fishing (Maps 11-16)

The aquaculture facility falls within the fishing area of six fixed gear fisheries: the California nearshore live finfish trap fishery, California halibut/white seabass set gillnet fishery, hagfish trap fishery, rock crab trap fishery, spiny lobster trap fishery, and spot prawn trap fishery. All of these fisheries have made landings into the Los Angeles/Long Beach Ports, according to state landings records. Fishing areas are defined by common operational fishing depths for each fishery.

Data source: Pacific Fisheries Information Network (PacFIN) and input from California Department of Fish and Game fishery managers

Also, the aquaculture facility location was compared with catch location data from California. California Department of Fish and Game (CDFG) uses 10x10 nautical mile longitude blocks for reporting catch location on fish landing records. The results of this comparison were similar for the California nearshore live finfish trap fishery, hagfish trap fishery, rock crab trap fishery, spiny lobster trap fishery, and spot prawn trap fishery.

The California halibut/white seabass set gillnet fishery is observed by NMFS federal observers. The observed set locations from 2010 and 2011 were included on the attached map. The observed set locations are very close but do not overlap with the aquaculture facility. Observer coverage in this fishery is low.

EXHIBIT 5 -National Marine Fisheries Comment Letter

9

Thank you for consideration of our comments. If in the unlikely event a project vessel collides with a marine mammal or sea turtle or an animal is observed entangled, the applicant or the Corps should immediately notify the Regional Stranding Coordinator, Sarah Wilkin (562) 980-3230, as soon as possible. Depending on the species, this event may trigger formal consultation under the ESA.

Please contact Diane Windham at 916-930-3619 or Diane.Windham@noaa.gov for overarching questions related to our aquaculture goals and initiatives. If you have any questions related to impacts to federal fisheries, please contact Jennifer Ise at 562-980-4046 or Jennifer.Ise@noaa.gov. For questions related to our EFH and FWCA comments, please contact Bryant Chesney at 562-980-4037 or Bryant.Chesney@noaa.gov. Lastly, for questions related to marine mammals contact Monica DeAngelis at 562-980-3232 or Monica.DeAngelis@noaa.gov and Christina Fahy at 562-980-4023 or Christina.Fahy@noaa.gov for questions on sea turtles.

Sincerely,


for Rodney R. McInnis
Regional Administrator

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CALIFORNIA WETFISH PRODUCERS ASSOCIATION

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December 16, 2013

Cassidy Teufel, Environmental Scientist
Energy, Ocean Resources and Federal Consistency Division
California Coastal Commission
45 Fremont, Suite 2000
San Francisco, CA 94105

**Re: Consistency Certification No. CC--035--12 Alternate Location – OPPOSE
Catalina Sea Ranch / KZO Proposal for 100-acre shellfish farm**

Dear Mr. Teufel,

I'm submitting this supplemental letter on behalf of the California Wetfish Producers Association (CWPA), representing California's historic fishery complex. "Wetfish," coastal pelagic species including sardine, anchovy, mackerels and market squid, constitute more than 80 percent of the volume of all seafood landed commercially in the Golden State and close to 40 percent of dockside value. These species also contribute more than 80 percent of volume and close to 50 percent of the value of all California seafood exports. The wetfish industry is the virtual backbone of California's seafood economy, an essential asset to the State overall, as well as to fishing communities such as Monterey, Ventura, Port Hueneme and San Pedro / Terminal Island, where this industry supports both fishing infrastructure and significant regional employment, including fishing and processing sectors as well as allied industries.

CWPA joins with other commercial and recreational fisheries, notably the Sportfishing Association of California (SAC), in expressing continued serious concerns regarding the proposal to locate an aquaculture farm, KZO / Catalina Sea Ranch, amid important spawning habitat and highly utilized fishing grounds on the San Pedro shelf, without first addressing critical issues such as liability and cumulative impacts posed both by operations and potential future expansion.

In our initial letter of opposition, we noted that project applicants did not consult with fishery representatives before or during development of their proposal. No communications with the fisheries occurred until CWPA volunteered to coordinate a meeting, which was held in San Pedro on August 9. A synopsis of that meeting is appended to this letter for reference.

Following that meeting, project applicants submitted an alternate location, and the new proposed site attempted to heed at least some of the fishermen's suggestions, which we appreciate. However, after reviewing the position of the alternate site, which is only about two miles away from the first site proposed but a bit closer to the shelf break (see attached map), fishermen continued to voice their concerns.

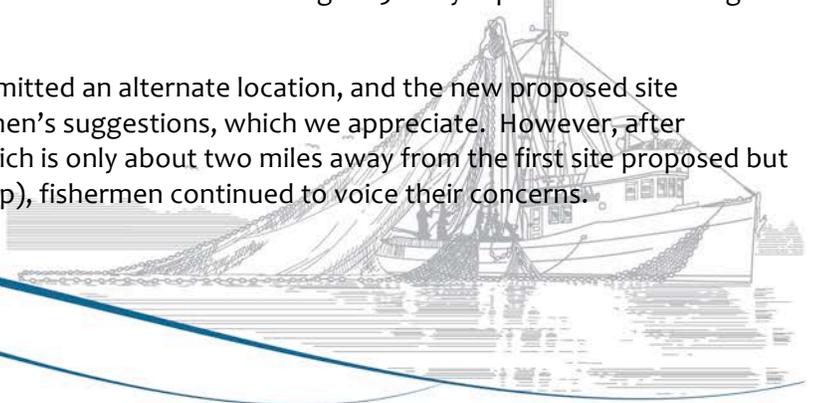


EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 2

Consistency Certification No. CC--035--12 – OPPOSE

Examples of fishermen's comments received :

"This is still in the sand bass and barracuda spawning grounds, and I would worry also about projected expansion of the project. It just seems to me that there would be a better place to put this thing than in a high traffic area."

"The new site is no better. The gill net boats fish there, the trawlers fish there and I would say the round haul boats also fish there, so do crab trappers. This is an area that has good clear bottom, which is what the fishermen that fish that area look for. I can't speak for the sport boats but in the past have seen them in this area. I can say I've seen plenty of whales around there also."

"Southern CA Trawlers Association can not support this so-called new site.

The thing to remember is when a storm comes this site will be all over the bottom-in a very large area- and the fishermen will suffer and the leaseholder will not be liable or able to clean any of it up. This has been experienced many times in the Santa Barbara Channel, a lot of it is still there after many years and the only people cleaning it up are the members of SCTA ... "

On October 23, 2013, I communicated these concerns to project applicants:

"Fishermen that I spoke with expressed appreciation that you were considering moving the location closer to the shelf break and closer to the rigs as they suggested, but the fishermen's recommendations that I recorded at the meeting noted support for exploring partnership opportunities with the oil rigs so the new aquaculture development could align with the existing footprint, which fishermen already need to avoid.

As I explained on the phone, coastal pelagic species, as well as other fish, frequent the entire San Pedro shelf area - so although your proposed new site is a bit deeper than the original, it is still only about 2 miles away and suffers many/most of the same impacts that the first location did. CPS frequent the entire San Pedro basin, and squid spawn in that area in different places year to year. I've also learned since our meeting that the oil companies are not interested in partnering, and also have concerns about siting your project too close to their operations and pipe lines. That leaves virtually no good area in San Pedro Bay that isn't free from conflict, that I can see."

In light of the fact that this proposal is moving forward for consistency review, I will reiterate core issues highlighted at the August 9 meeting between fishermen and KZO project applicants.

Both SAC and CWPA remain opposed to locating the shellfish farm at the proposed alternate location for numerous reasons:

- The site is proximate to the largest spawning area for barred sand bass in southern California, a critically important recreational resource.
 - Although proponents claim no ecological harm, there is no evidence to prove the allegation that a shellfish farm would not negatively impact the ecosystem, disrupt a major spawning area located in close proximity, or alter the flow of fish on the shelf
- Socio-economic harm to commercial and recreational fisheries
 - Proponents claim their 100-acre site is a miniscule fraction of San Pedro Bay. However, as reported at the meeting on August 9, the 100 acres proposed is the tip of the iceberg. Boundaries of the proposed site must be expanded by at least 2-3 miles on each side to minimize potential impacts from purse seiners drifting into aquaculture long lines during the process of pumping fish from net to boat, with resultant "big mess". The proposed location also interferes with other fisheries, as fishermen stated at the meeting. Thus actual area off limits to fishing could range as high as 9 square miles.

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 3

Consistency Certification No. CC--035--12 – OPPOSE

- Alternate site is in Block 739: Most important wetfish (squid, sardine) fishing block in San Pedro Bay
 - According to Department of Fish and Wildlife statistics, Block 739 produces as much as 47 percent of sardine landings into Los Angeles area ports (2009) and 11 percent of market squid landings (2010).
 - The LA ports of San Pedro and Terminal Island represent an average 60 percent of sardine and 44 percent of squid landings statewide. The five-year average ex-vessel value of these two wetfish species landed in Block 739 is close to \$3 million.
 - Single year commercial landings in recent years have exceeded \$5 million (2010, with more than \$3 million from squid)
 - Market squid is California's largest, most valuable fishery, and squid landed in Block 739 contribute to the fishery's importance. Squid fishing activity has been recorded within 0.12 miles of the proposed site. At the August 9 meeting, fishermen explained that squid spawning locations vary both within seasons and year to year. In fact, in 2013 squid fishing in Block 739 may be occurring within the 100-acre site proposed for the shellfish farm.
- Liability is a burning issue that needs to be resolved in writing as a condition of project approval
 - Fishermen expressed grave concern over the issue of liability – who pays for the damage caused if a fishing boat drifts into the farm and entangles aquaculture long lines, or destroys fishing gear?
 - Further, who cleans up debris from the aquaculture site if damaged or destroyed by massive storm, or abandoned if the project fails?

Regarding liability for lost or damaged fishing gear, if the Commission approves this proposal, we recommend that the permit include a condition that details explicitly how liability will be addressed. For example, Application E-11-017, filed by Pacific Gas and Electric Company on March 5, 2012, included as Special Condition No. 10:

Lost/Damaged Fishing Gear Compensation Plan. PRIOR TO ISSUANCE OF THIS PERMIT, PG&E shall submit for Executive Director review and approval a Lost/Damaged Fishing Gear Compensation Plan that outlines the steps that would be taken by PG&E to address any adverse impacts to commercial fishing operations that may result from the loss and/or damage of fishing gear due to contact or entanglement with the proposed seismic monitoring array.

In addition to this language, we recommend adding explicit language indemnifying fishermen and/or fishing vessels from liability in the event of contact or interaction with the aquaculture operation, i.e. “hold harmless and indemnify the vessel, fishermen, successors and assigns from any claims, demands, costs, expenses and liabilities for any damage to the aquaculture structure, personnel or operation, or public or private properties or personal injury that may result directly or indirectly from interaction with the project.”

Regarding liability of KZO and assigns for lost equipment or abandonment of the site in event of project failure, the Southern California Trawlers Association has had long experience with project abandonment in the Santa Barbara Channel. We are appending to this letter some recommendations that SCTA submitted to the California Department of Fish and Wildlife and Fish and Game Commission in 2005, which pertained to aquaculture development in state waters, but the recommendations are also germane and applicable to this project, should the Coastal Commission decide to approve it. Please refer to the letter for specific recommendations, including posting of a \$100,000 bond to assist in clean-up efforts if needed.

- Expansion is a real threat, in light of current lack of Marine Spatial Planning goals and policy direction
 - At the August 9 meeting, discussion ensued on the lack of marine spatial planning policies to govern future multiple uses of productive fishing grounds. It was noted that early public relations efforts advanced by Catalina Sea Ranch promoted expansion to 10,000 acres or more – the largest offshore shellfish farm in California. The initial proposal, in fact, encompassed 1,000 acres of the San Pedro shelf, and a slide embedded in the CSR website depicted an area encompassing 26,300 acres, a significant portion of San Pedro Channel (see attached chart). When questioned about future expansion plans, a CSR principal acknowledged that expansion “... is possible.”

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 4

Consistency Certification No. CC--035--12 – OPPOSE

- o Expansion poses increased future impacts on fisheries.
 - Fishermen attending the August 9 meeting warned that in the absence of MSP policies, any aquaculture site established now would likely be grandfathered into an eventual marine spatial planning exercise, and that fishing zone would be lost to current commercial and recreational fisheries.
 - Fishermen pointed out that more than 20 percent of valuable fishing area was recently closed to recreational and commercial fishing in Southern California in the Marine Life Protection Initiative, and the fisheries could not afford to lose more productive fishing turf.

At the conclusion of the August 9 meeting, the fishermen in attendance stated that their opposition to the shellfish farm did not signify opposition to aquaculture as a whole. They simply objected to the proposed location at the time, and after reviewing the alternate site proposed by project applicants, only two miles away, they continue to voice concern.

Fishermen suggested an alternate site aligned with existing oil platforms, which already have an established footprint that must be avoided by the fishing fleet. Juxtaposing the farm with an existing platform might also alleviate the need to drill additional anchors into the substrate, possibly harming both sand bass and market squid spawning areas. Shellfish aquaculture affiliated with oil platforms has already demonstrated substantial success. However, as I noted earlier in this letter, we learned after our meeting that the oil companies are no longer interested in partnering, and also have concerns about locating any project too close to their operations and pipe lines. That leaves virtually no good area in San Pedro Bay that is not free from conflict.

I have also recommended the need for an aquaculture/fisheries liaison committee and marine spatial planning (MSP) process to identify appropriate sites for offshore development that do not impinge on important fishing grounds. I continue to explore options to convene a liaison committee to engage in discussion regarding MSP. It is clear that fishermen bring deep knowledge to the table, not only of marine resources and habitat, but also of operations that can facilitate real cooperation among seafood harvesting and aquaculture (and potentially other development) interests.

Thank you very much for your consideration of our continuing concerns and opposition to the proposed alternate site of this project. We greatly appreciate your analysis of Coastal Act policy Section 30234.5: “The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.”

We recommend the California Coastal Commission deny this project, or at the very least, mandate conditions addressing liability issues, as well as objective long-term monitoring to document the impact of this project on resources and fisheries.

Please also consider, the best intentioned and responsible mitigation measures addressing liability and calling for full abandonment and seafloor restoration do not ensure that a project will fully address burdens on other users, be removed in its entirety, or that the seafloor will return to its pre-project state. On the California OCS, many such mitigated projects built and operated by responsible, well-financed project proponents are either abandoned in place or converted to other uses, with the knowledge and support of regulatory agencies. The cited reasons tend to be socio-economic (users want to repurpose the structures), financial, and/or environmental (complete removal may do more harm than leaving the seafloor as is).

One overarching reason for the fishermen’s continuing opposition to this project is the knowledge that once this area is lost to fisheries, it will be gone permanently.

Best regards,



Diane Pleschner-Steele
Executive Director

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Consistency Certification No. CC--035--12 – OPPOSE

Relationship of alternate site to original proposal:

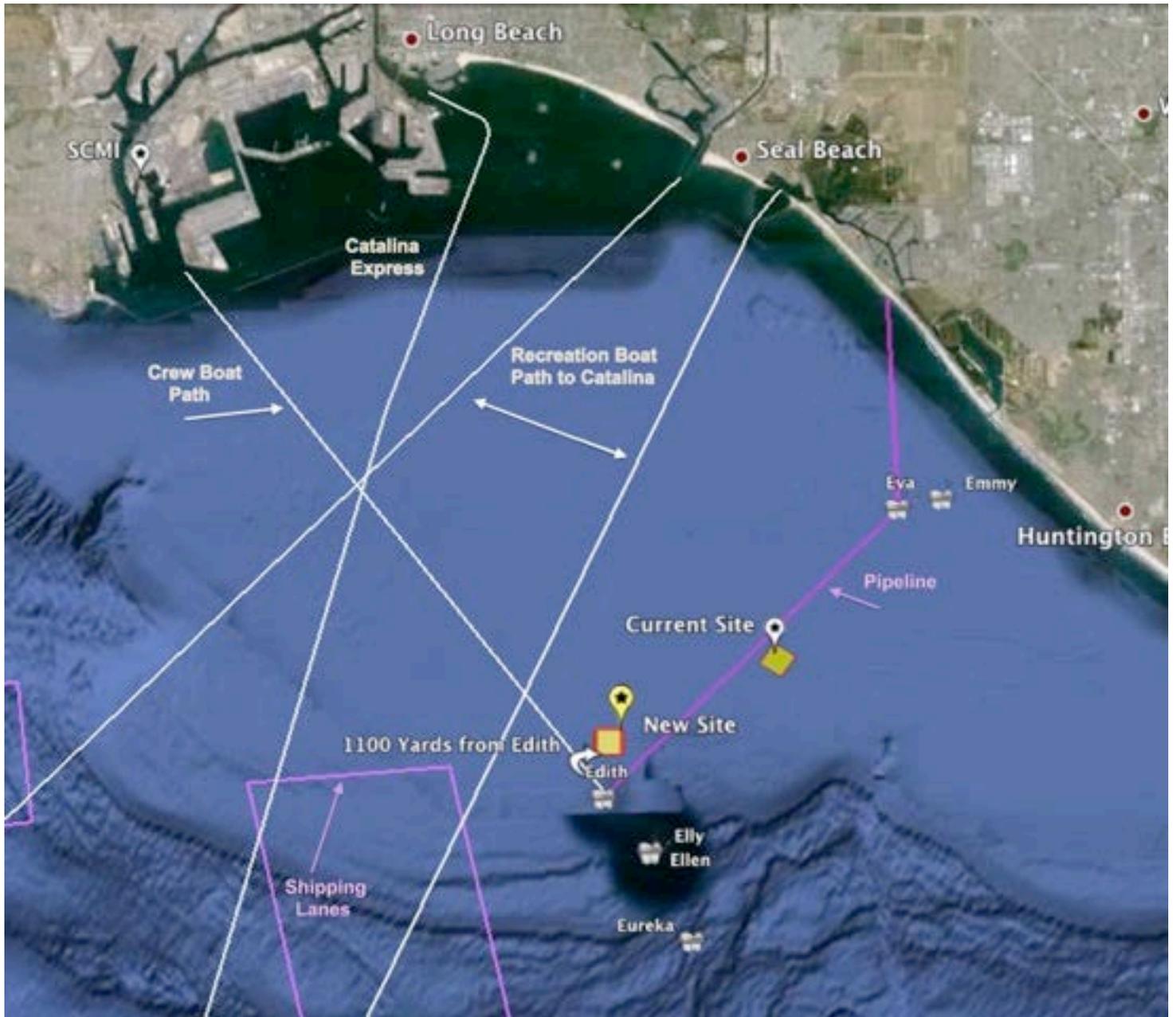


EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Consistency Certification No. CC-035-12 - OPPOSE

Area identified as potential for expansion from KZO original site proposal

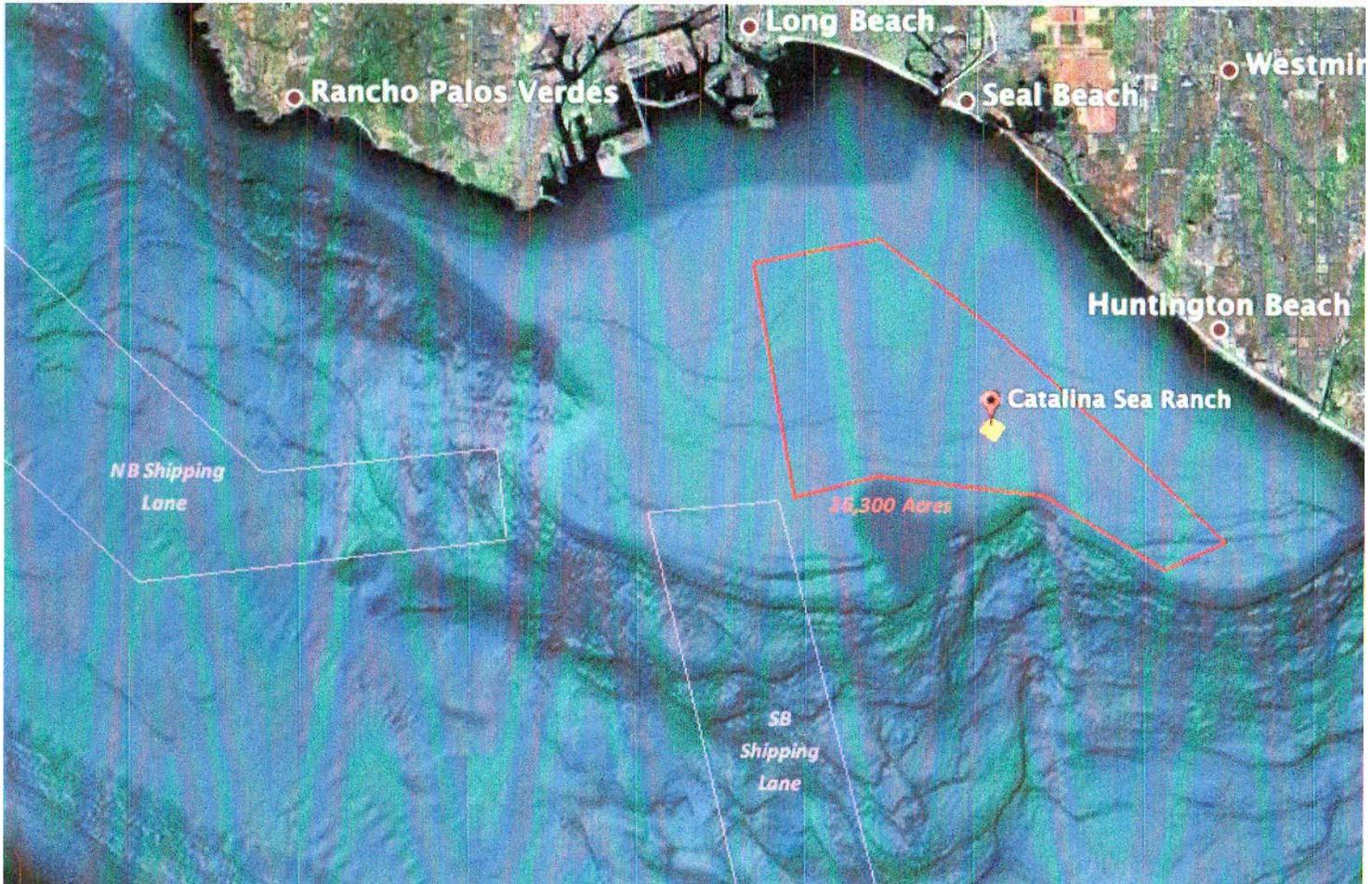


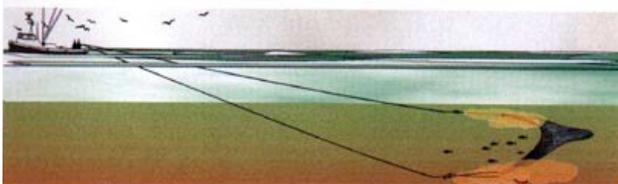
EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Consistency Certification No. CC--035--12 – OPPOSE

Page 7

Copy of SCTA Letter to Department of Fish and Game et al re: State Mariculture Lease Program



Southern California Trawlers Association

July 7, 2005

Mr. Ryan Broddrick, Director
California Department of Fish and Game
1416 Ninth Street
Sacramento, CA 95814

RE: STATE MARICULTURE LEASE PROGRAM

Dear Director Broddrick:

As you know, our organization is composed of a group of small trawl boats home-ported along the coast from Morro Bay to Ventura. We write you today to express concerns regarding the condition of the State's mariculture lease program, codified in Division 12 of the California Fish and Game Code. Specifically, we have had long experience with a number of leases in the Santa Barbara Channel, including some that have been habitually derelict in maintenance, lawful marking, and other aspects of lease tenure. Our trawl nets end up bearing the brunt of such derelict equipment and supplies on the seafloor, either by tearing up our nets, ruining catch, or prohibiting trawling in improperly abandoned leases. The question of liability for such damages is also a natural consequence of such interactions with fishing gear.

As a result, we have a number of what we hope are constructive suggestions to improve the mariculture lease program, and respectfully request the Department to give due consideration to a number of potential improvements to the regulations governing future mariculture leases. Before providing these suggestions, however, we would like to provide some historic context for our concerns, and for why we believe our suggestions for improving the leasing program should be given all due consideration.

The history of the state's marine tidelands aquaculture leasing program began nearly 40 years ago, when the state decided that seafloor leases could be granted within the marine sanctuary created in front of the City of Santa Barbara after the 1969 oil spill. The state believed this sanctuary would be a good place to lease for aquaculture purposes. At first, there were very few regulations, and few requirements for lessees. A number of leases were granted, but one potential lessee, Ecomar, did not want to be that close to the Santa Barbara City municipal wastewater outfall, and was granted a lease outside the sanctuary. There was no bonding provision, no marking requirements for lease boundaries or equipment. Coincidentally, in that first year of lease establishment, we recall that salmon fishing was quite good in the Channel, and salmon trollers lost quite a bit of gear, particularly on the one lease outside the sanctuary area, which happens to have been in a good area for both salmon and halibut fishing.

We met with then-director of the State's aquaculture program, Mr. Emil Smith, and discussed the utility of marking requirements for lessees. The outcome of this was the establishment of marking requirements, and a provision that the lessee had 2 weeks to replace lost lease corner markers, or face a fine. Unfortunately, no fines were actually specified in the Fish and Game Code, so this was an ambiguous and unenforceable proviso of the aquaculture regulations at the time.

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 8

Consistency Certification No. CC--035--12 – OPPOSE

Another regulation enacted at that time was that, upon lease termination, the lease area was to be put back in its original condition by the lessee, and there was to be a post-site-clearance inspection by either the Department or an independent inspector. Unfortunately, these provisions were also not backed up with concomitant penalties for non-compliance, and have also not been heeded by lessees. Some leases off Goleta were terminated and abandoned with large anchors made up of used car engine blocks, railroad rail or wheel iron, concrete blocks, and other miscellanea, all of which are still littering the seafloor there.

When Mr. Mezey's leasehold barge broke free from its moorings and hit Stearns Wharf in Santa Barbara 15 or 20 years ago, it became clear to the Department that some kind of performance bond was necessary to make sure that leases were maintained and terminated correctly. Unfortunately, the existing \$5,000 bond proviso in the Code does absolutely nothing to either deter lessees so inclined to simply walk away from the leases, or to provide sufficient funds for the Department to go out and inspect and clear away seafloor debris left behind either accidentally or intentionally.

During this period, our members have written letters to the Department or Commission, or spoken before the Fish and Game Commission, at least a half-dozen times about the deplorable state of enforcement for the aquaculture lease program, to little or no effect. The mess surrounding the ambiguously-located and poorly-if-ever-correctly marked Ecomar lease, in particular, has been noted repeatedly to the Department and Commission. There are currently two debris piles associated with that lease; the newer one, farther offshore, including 3,000 pound concrete blocks. When the company went out last year to re-mark the area, even *they* didn't have the correct location for the lease, and consequently marked the wrong location.

Now, the original owner of the lease has passed away due to an industrial accident; the company is insolvent, perhaps bankrupt, the subject of employee lawsuits, and the like. But the junk is still on the seafloor. We remark about this particular lease not to single out Ecomar, but to point out to the Department and Commission that the entire aquaculture lease program regulations are in dire need of a 21st century update. A \$5,000 bond is laughably inadequate for any marine salvage or site clearance operations by either the Department or private contractors; the ambiguous lease stipulations and agreement leave open any interpretation of termination or abandonment whatever; and the penalties for noncompliance are either missing or woefully inconsequential as incentives for due diligence.

A different model can be seen by taking a look at the State Lands Commission's oil and gas decommissioning and abandonment regulations, as well as those of their federal counterpart, the Minerals Management Service. In these regulations, specific duties are imposed on lessees of seafloor areas, including marking equipment with lessee name in the event of loss at sea, site clearance protocols, and significant bond requirements and penalties for non-compliance that make such lessees much less prone to negligent abandonment of leases.

Our recommendations

To create a 21st-century sustainable model for the State's aquaculture lease program, we have a number of specific suggestions for improving the regulations governing the leasing of state tidelands for aquaculture purposes, outlined below.

1. Fee structure

The fee structure for leasing state tidelands should accurately reflect the State's costs, some or which, but probably not all, are

- permitting and licensing paperwork
- monitoring performance of the lessee
- periodic physical inspection of state tidelands aquaculture leases
- receiving and reviewing annual lessee fiscal and operations reports
- inspection and site clearance, as necessary, upon termination and abandonment of lease
- enforcement of lease terms and conditions

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 9

Consistency Certification No. CC--035--12 – OPPOSE

2. Lease stipulations

▪ Bonding requirements

A State tidelands lessee should be required to post bond in the amount believed necessary for the State to clean up the site in the event of derelict lease site abandonment.

For ocean monitoring, inspection and salvage work lasting anywhere from 2 to 5 days, a \$100,000 bond would not be incommensurate with the real costs of doing this work.

Failure to set the bond at an appropriate level leaves the State “holding the bag”

for site clearance and/or the liability that goes along with permitting a leaseholder to litter the seafloor with potentially life-threatening or other marine user-damaging debris.

▪ Clear lessee performance requirements

- + a threshold of annual investment for lease maintenance and improvements, perhaps on the order of \$5,000 to \$10,000 of proven (receipts) of annual investment
- + a minimum economic return on investment after three or five years of lease development, perhaps on the order of \$10,000 to \$15,000 in minimum annual product sales after 3 to 5 years of lease development.

▪ Unambiguous lease marking requirements

- + Lighted, radar-reflected buoys to be maintained at each of the four corners of the leased submerged tidelands.
- + Monthly inspection and maintenance of the buoys, and/or as needed upon report of missing or non-operational buoys.

3. Penalties for non-compliance with lease terms and conditions, including, but not limited to

- proper lease marking conditions
- adequate economic investment and/or performance terms
- proper lease termination and decommissioning/abandonment

Penalties should be of a size and/or nature to provide sufficient incentive for leaseholders to perform according to lease terms and conditions. Examples of these might be

- after 30 days notice of lease improperly marked, \$2,000 fine
- after 60 days notice of lease improperly marked, termination of lease.
- after two years of noncompliance with lease maintenance/improvement terms and conditions, termination of lease.
- for inadequate abandonment and/or post-abandonment site clearance, forfeiture of \$100,000 bond over to the State, so the Department can adequately restore State tidelands to pre-lease conditions.

The purpose of these suggested reforms of the State’s aquaculture leasing regulations is not to penalize the aquaculture industry, but to instill a minimum level of professionalism and citizen/corporate responsibility in others who would use public trust resources (state tidelands, in this case) for profit. Also, these regulations would ensure that aquaculture on state tidelands is done with a minimum of interference with other marine users, be they recreational or other commercial uses, and with the same kinds of resource protection standards and regulations to which members of our Association are held.

Our Association members take pride in the fact that we have been at the forefront of developments in the trawl industry to minimize bycatch as we seek fresh seafood for California seafood consumers. We have taken a wide variety of technical and regulatory steps to minimize our impacts to habitats and habitat-forming organisms such as deepwater corals and sponges of such recent concern to the ocean conservation community. As you know, we recently worked with ocean conservation organizations to re-craft the California Halibut Trawl Grounds regulations to avoid damage to deepwater habitats and habitat-forming organisms while minimizing bycatch. We do not take halibut in the Grounds during spawning season (others do). We have also collaborated with Department and University researchers to minimize bycatch of finfish in our ridgeback prawn trawl fishery, through a collaborative research grant from the Pacific States Marine Fisheries Commission. We just finished working with ocean conservation organizations recently to craft protections for essential fish habitat under the Federal Magnuson Act that

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 10

Consistency Certification No. CC--035--12 – OPPOSE

allow sustainable trawling to continue in California while minimizing impacts to habitat and bycatch species of concern like stock-rebuilding rockfish, governed by the Pacific Fisheries Management Council and the State together. This resulted in the complete protection from trawling of over 200,000 square miles of the Exclusive Economic Zone, much of which is off California and in California State waters.

What we are suggesting, with these updates to the State's aquaculture leasing program, is a similar level of responsibility and attention to the details of citizen and/or corporate environmental conduct, as our Association's members have repeatedly demonstrated. This fine-tuning of the State's aquaculture leasing program should put the State at the forefront of environmental responsibility with respect to aquaculture well into this new century.

The other consequence of a more clearly defined aquaculture leasing program in California is the resolution of responsibility or liability for consequent damages to other marine users and their equipment or facilities due to any seafloor debris left as a result of improperly abandoned lease operations. The State Lands Commission certainly has taken their liability issues seriously with respect to the "attractive nuisance" conditions of remnant oil industry debris in state tidelands. The Department should be no less interested and attentive to this potential liability issue emerging from aquaculture leasing.

These suggestions are entirely consistent with the California Ocean Protection and Management Program currently being refined under the aegis of the California Resources Agency. As a leader in this ocean resource management area, the State would then be in an ideal position to comment on the emerging Federal initiative to put the U.S. on an equal footing with other countries with respect to aquaculture production. There is currently on the table a proposal from Chevron, Inc. and Hubbs Sea World to place large open-ocean aquaculture facilities just outside State jurisdiction in Federal waters, about which we are certain the State will be commenting, if it has not already, to the Federal government. There are, no doubt, other federal aquaculture programs waiting in the wings. Having the State's own house in order with respect to its aquaculture program puts the State's comments in a much stronger position of credibility than the current, unfortunate, condition of the State's aquaculture leasing program in its own tidelands.

Thank you for taking the time to consider our suggestions for improving aquaculture practice in California's ocean. All of our members, and all of the state's citizens, will be the better for an improved aquaculture program in California. Please do not hesitate to contact our representative, Mr. Mike McCorkle, to discuss any of the above information or suggestions. He can be reached at (805) 566-1400 or via email at mccorkle@cox.net.

Sincerely,

Mike McCorkle,
President

c: Mr. Jim Kellogg, Fish and Game Commission
Mr. Michael Flores, Fish and Game Commission
Mr. Robert Hattoy, Fish and Game Commission
Mr. Richard Rogers, Fish and Game Commission
Ms. Cindy Gustafson, Fish and Game Commission
Mr. Bob Treanor, E.D., Fish and Game Commission
Mr. Gary Stacey, Marine Region Director
Mr. Mike Chrisman, Resources Secretary
Mr. Brian Baird, Assistant Resources Secretary for Oceans
Hon. Pedro Nava, California State Assembly
Hon. Tom McClintock, California State Senate
Hon. Lois Capps, House of Representatives
Hon. Barbara Boxer, U.S. Senate
Hon. Diane Feinstein, U.S. Senate

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Consistency Certification No. CC--035--12 - OPPOSE

Map prepared by Department of Fish & Wildlife illustrating location of first site proposed relative to squid fishing impacts. Alternate site is only two miles away to the southwest.

Market Squid CFIS Data by Fishing Season San Pedro Channel

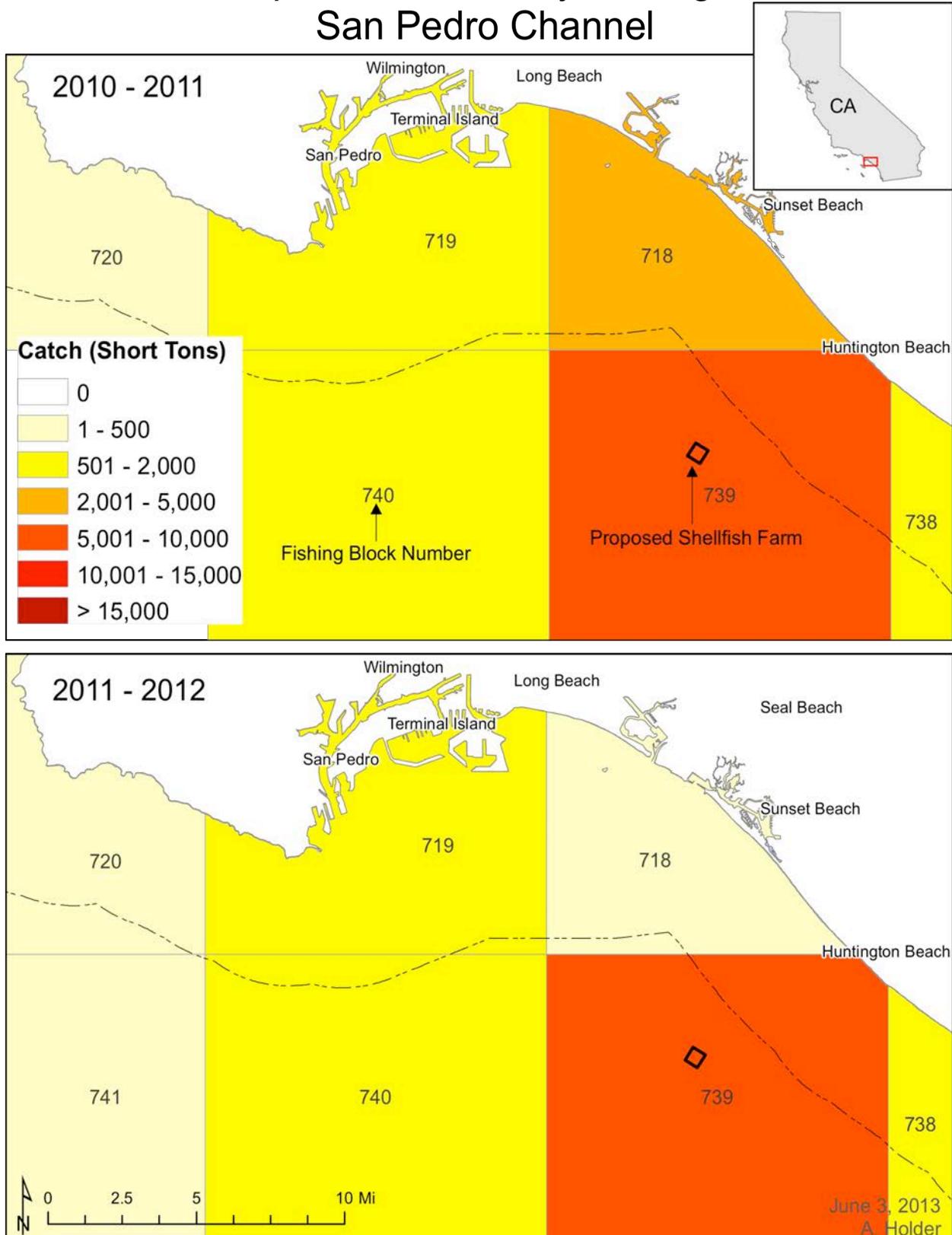


EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Consistency Certification No. CC--035--12 – OPPOSE

Page 12

BLOCK 739 SHELLFISH FARM VS. SAN PEDRO FISHERIES MEETING SYNOPSIS

RAFAELLO'S RISTORANTE

AUGUST 9, 2013

The California Wetfish Producers Association (CWPA) coordinated a meeting between fishermen and markets and Catalina Sea Ranch (CSR) proponents to discuss concerns related to the shellfish farm proposed by KZO / CSR in Block 739 of San Pedro Bay.

In attendance:

Fishermen

Name	Affiliation	Phone / Email
Bruce Steele	FV Halcyon	805-686-9312
Mike Kucura	FV Tom & Gerry	mkucura@cox.net
Joel Harrison	FV Loren	
Mike McCorkle	Southern CA Trawlers Association	mccorkle@cox.net
Ken Franke	Sportfishing Association of CA	Kfranke2@san.rr.com
Steve Crooke	SAC scientific advisor	sjcrooke97@aol.com
Rich Ashley	Long Beach Bait Co. / FV Provider	562-307-4468
Corby Jackson	San Pedro Bait Co. / FV Pamela Rose	714-791-0143
Mike Conroy	West Coast Fisheries	562-761-7176
Don Brockman	Davey's Locker / FV Donzrig	949-279-9369
Diane Pleschner-Steele	California Wetfish Producers Assoc.	805-693-5430

Markets

Vanessa DeLuca	State Fish Company	310-832-2633
John Car	Tomich Bros. Seafood	jcar@tomichbros.com
Robert Weiner	Star-Box Company	562-283-3500
Nathan Weiner	Star-Box Company	562-283-3500

Catalina Sea Ranch

Phil Cruver	Catalina Sea Ranch CEO	562-544-7410
Debbie Johnson	Catalina Sea Ranch Co-owner	562-216-0359
Dale Kiefer	USC – scientific advisor	310-678-5081
Craig Freels	Seafood industry	210-332-7784
Jerry Freels	Retired	210-332-7858
Zai Catanzaro	Modern Energy	512-902-4005

Fishermen in attendance represented a range of fisheries with direct experience fishing in block 739, including commercial squid, sardine, driftnet and trawl fisheries and the recreational CPFV fleet. The two processors in attendance are large-scale wetfish processors located in San Pedro, who employ approximately 525 processing crew in aggregate (excluding allied jobs such as trucking, packaging etc.).

Note: Overall, the S.CA. sardine/wetfish industry consists of 7 to 9 processors, employs between 1,400 and 1,500 workers, including seasonal employees, and the maximum packing capacity is estimated between 1,900 and 2,000 tons per 24 hour day, in aggregate. (Pleschner-Steele, SOUTHERN CALIFORNIA CPS PROCESSOR COST-EARNINGS REPORT, 2004)

Of the 63 federally permitted CPS limited-entry vessels, 37 (59 percent) are home-ported in S.CA. (NMFS).

According to DFW landings statistics, Block 739 represented the highest catch block for market squid in both the 2010-11 and 2011-12 seasons, and as high as 47 percent (5-year average 30 percent) of Pacific sardine landings into San Pedro / Terminal Island.

The CPFV fleet in S.CA. accounts for 165 commercial passenger fishing vessels, transporting one million passengers per year in marine recreational activities. The CPFV fleet represents \$2.2 billion in direct and indirect economic impacts in California and SAC is substantial portion of that impact.

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 13

Consistency Certification No. CC--035--12 – OPPOSE

The meeting opened with round-table introductions, then Catalina Sea Ranch CEO Phil Cruver gave a short 10-slide presentation on the shellfish farm proposed for Block 739 in San Pedro Bay.

Highlights:

- Area proposed is only 100 acres, a very small fraction of available habitat
- Initial project consists of 40 long lines submerged 30 feet underwater
- Hope there would be no conflict with fishing with hulls under 30 ft.
- Ecology – no problems with bivalve culture
- San Pedro shelf is unique for cultivating shellfish (sand bottom, anchors in sand – no hard substrate)
- Area was identified by US Coast Guard
- No negative ecological impact
- Socio-economic impact?? (acknowledged there may be some, but couldn't quantify impact from 100-acre location)
- \$33 million annual revenue lost in Imported mussels from Prince Edward Island
- Shellfish farm represents positive economic impact
- Can offset trade imbalance
- Represents new jobs (in discussion, acknowledged only 10 jobs per 100 acre farm)
- CA shellfish initiative – promoting aquaculture in CA, also NOAA is promoting aquaculture
- CA Coastal Commission can review project but final decision is made by Secretary of Commerce (Interior?)
- Authority for operation by US Army Corps of Engineers

Diane Pleschner-Steele distributed a series of handouts, the first map ^[1] illustrating the location of the proposed shellfish farm in San Pedro Bay; the second ^[2] extracted from a CSR powerpoint presentation depicting the 26,300 acres of federal waters of the San Pedro Shelf surrounding CSR's initial 100-acre shellfish ranch, ostensibly available for expansion; and the third ^[3] a chart entitled "Market Squid CFIS Data by Fishing Season, San Pedro Channel," showing that Block 739 had the highest squid landings in San Pedro Bay in the 2010-11 and 2011-12 fishing seasons.

Roundtable discussion ensued; highlights of Q&A follow:

Don Brockman – President of Davey's Locker Sportfishing and owner of squid light boats, fishing for around 30 years:

- Important to recognize that S.CA. fisheries recently lost about 30% of productive fishing grounds in state waters during the Marine Life Protection Act process, and fishermen can't afford to lose more good fishing turf.
- The proposed shellfish farm is sited in the middle of the most productive squid fishing grounds in San Pedro Bay. Squid move around in that area, spawn in different places near or in the proposed site year to year.
- Also a very important spawning area for sandbass
- Not opposed to shellfish farming, but can't the farm be located in deeper water at the edge of the shelf, someplace that doesn't interfere with fisheries?
- Asked if shellfish longlines would be set east to west. Noted that fishermen could work better around the farm if the shellfish longlines were set in east-west configuration.

Rich Ashley – Long Beach Bait Company, FV Provider fishes for sardine and squid in block 739:

- Voiced concern over liability / impacts to both fishing gear and shellfish farm long lines from fishing boats drifting into the farm's operation. Described the procedure of drying up a purse seine net with 80 tons of squid or sardine in high wind and swell conditions, noting that the fishing vessel could not control drift in weather conditions, which could amount to 2 or 3 miles while pumping or brailing the catch into the hold. The resulting impact of contact: a big mess!
- Noted 120 feet, 20 fathoms, is an important depth for many fisheries. He opposed any aquaculture development in 20 fathoms in the middle of productive fishing grounds.

Mike Kucura – FV Tom & Gerry, gillnets for halibut, seabass etc. and brails for squid, fishes in block 739:

- Gillnetters were restricted to fish outside 3 miles and the Huntington Flats, San Pedro Bay are one of few remaining fishing areas for halibut, seabass and other fish in S.CA.
- Shellfish farm impedes ability to set drift or set nets.

John Car – VP Operations for Tomich Bros. Seafood and Qualy/Pak Specialty Foods, large processors located in San Pedro: Noted that the proposed 100-acre site in reality will consume at least triple the area or more, when fishing operations are considered. Purse seine fishermen will not be able to fish closer than 2 or 3 miles away from the boundary of the proposed site due to drift problems in the haul-back procedure.

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 14

Consistency Certification No. CC--035--12 – OPPOSE

Ken Franke – President of Sportfishing Association of California, representing 165 commercial passenger fishing vessels in S.CA.:

- o Asked two key questions:
- o Regarding liability – who pays if a fisherman drifts into the shellfish farm and damages operations or infrastructure?
- o What are CSR's expansion plans?
- o Noted that recreational fleets look at this proposed aquaculture development as another closure.
- o The company made no effort to contact the fishermen, talk to the CPFV landings or commercial interests before this, and this meeting was organized by fisheries reps.
- o Recommended that CSR consider partnering with oil lease holders and develop shellfish farms in association with oil platforms, example: Hubbs Sea World partnership with Chevron.
- o Oil platforms have existing footprint in area where fishermen are restricted --
- o Partnership would be win-win: good PR for oil industry and cost savings on infrastructure for shellfish farm, plus avoid negative impacts to fishing areas

Mike McCorkle – President of Southern California Trawlers Association, owner of FV Pie Face, a trawler operating in S.CA from Santa Barbara to San Pedro for more than 50 years:

- o Noted his experience with aquaculture ventures in other areas; the company goes bankrupt and leaves debris on the bottom of the ocean
- o Commented that fishermen are liable for the cost of their gear and catch if they lose gear on an aquaculture setup

Bruce Steele – sea urchin diver for 40 years in Santa Barbara area:

- o Noted that the federal government is pushing Marine Spatial Planning initiative, but this project precedes any formal discussion
- o Any aquaculture sites (or other development) approved before MSP policies are developed are likely to be grandfathered in
- o This 100-acre site is just the beginning. In reality, if this site is approved, expansion will follow.

Comments from Phil Cruver:

- o Company searched for potential sites from Santa Barbara to San Diego for more than a year and found San Pedro Shelf to be best location -- anything over 200 ft. is too deep (for proposed longline setup). He noted the proposed site was suggested by USCG (but without communicating with any fishing interests)
- o Acknowledged that discussions with fishermen early in the process would have been helpful. Fishermen made good suggestions, i.e. setting gear east/west, and using visible marker buoys with radar reflector and light
- o Re: liability, Cruver promised CSR would not hold fishermen liable for damage to anchor or longline structure or shellfish in event of contact
- o Re: expansion, “expansion depends on operations in the next few years... If no conflicts, expansion is possible”
- o Re: authority, Cruver noted that the sole authority for shellfish farm operation is the Army Corp. of Engineers, with CA Coastal Commission review. CCC disapproval would lead to negotiated settlement by Secretary of Commerce
- o Re: fishermen's proposal to relocate the shellfish farm in conjunction with oil platform(s), Cruver and scientific advisor Dale Kiefer from USC both expressed interest - thought it a good idea, and Cruver said he would follow up with his contacts in the oil industry to explore possibilities.

Summary of meeting discussion by Diane Pleschner-Steele, CWPA, and Ken Franke, SAC:

Both SAC and CWPA remain opposed to locating the shellfish farm at the proposed location in Block 739 for numerous reasons:

- o Major spawning area for sandbass, a critically important recreational resource
- o Socio-economic harm to commercial and recreational fisheries
- o Most important wetfish (squid, sardine) fishing block in San Pedro Bay
- o 100 acres proposed is the tip of the iceberg -- must expand the area by at least 3 miles on each side to minimize potential impacts from fisheries drifting into site, with resultant “big mess”
- o Liability is a burning issue that needs to be resolved in writing
- o Expansion is a real threat, in light of MSP goals coupled with current lack of policy direction
- o Expansion = increased future impacts on fisheries

Both SAC and CWPA offered political support to help the shellfish farm relocate to an area adjoining or adjacent to an existing oil platform, which has an established footprint and does not usurp the remaining valuable fishing grounds.

EXHIBIT 6 - Commercial Fisheries Organization Comment Letter

California Coastal Commission

Page 15

Consistency Certification No. CC--035--12 – OPPOSE

Pleschner-Steele also recommended the need for an aquaculture/fisheries liaison committee, similar to the oil/fisheries liaison committee established at the beginning of oil development in S.CA.

She volunteered to help coordinate continuing efforts to communicate with aquaculture interests, as it was apparent from this meeting that fishermen bring deep knowledge to the table, not only of marine resources and habitat, but also of operations that can facilitate real cooperation among seafood harvesting and growing interests.

EXHIBIT 6 - Recreational Fishing Organization Comment Letter



www.californiasportfishing.org

April 24, 2013

Cassidy Teufel
California Coastal Commission
Energy, Ocean Resources and
Federal Consistency Division
45 Fremont St., Suite 2000
San Francisco, Ca 94105

Dear Mr. Cassidy,

We have reviewed the notice regarding placement of the aquaculture farm between the oil rigs off Long Beach. The Sportfishing Association of California has members who operate vessels in that specific area. These are commercial passenger carrying sportfishing vessels that take customers out for recreational fishing opportunities. Those opportunities are dwindling as more and more area is closed to access.

After consultation with the owners and Captains in that area we have concluded there would be negative impact if this aqua farm were installed. That location is the spawning grounds for sand bass. The area is also where the bait company and commercial squid haulers operate. The loss of 100 acres of prime fishing area is not acceptable.

We therefore strongly oppose installing the aqua farm in the proposed location.

Sincerely,

A handwritten signature in dark ink, appearing to read "Ken Franke". The signature is fluid and cursive, with the first name "Ken" and the last name "Franke" clearly distinguishable.

Ken Franke
President

EXHIBIT 7 - Commercial and Recreational Fishing Data from CDFW

Catch of market squid logbook and CFIS data South of Point Conception (34°30'0"N) and in the San Pedro Channel (Fishing Blocks 718, 719, 739, 740) from the 2000-2001 fishing season to the 2011-2012 fishing season. Logbook catch inside the proposed shellfish farm from the 2000-2001 fishing season to the 2011-2012 fishing season. Closest point column denotes the catch record closest to the proposed shellfish farm for that season in miles (mi). Note: Most of the vessel logbooks have been entered for 2011 and some for 2012.

Original Location

Fishing Season	Catch South of Pt. Conception		Catch in the San Pedro Channel		Logbook catch inside proposed KZO shellfish farm (Short Tons)	Closest Point (mi)
	Logbook Data	CFIS Data	Logbook Data within blocks 718,719,739,740	CFIS Data Blocks 718,719,739,740		
2000-2001	79,335	113,121	1,147	2,162	0	0.12
2001-2002	75,737	91,081	1,382	1,152	0	0.39
2002-2003	14,265	18,990	380	274	0	1.05
2003-2004	32,826	40,336	514	892	0	4.39
2004-2005	39,686	47,595	0	175	0	25.02
2005-2006	61,669	78,972	6,120	6,224	0	0.39
2006-2007	33,055	37,606	1,430	1,770	0	2.63
2007-2008	46,924	50,347	4,704	4,094	0	0.29
2008-2009	32,956	39,182	284	729	0	2.18
2009-2010	51,473	92,433	522	992	0	1.29
2010-2011	54,709	109,786	4,909	11,185	0	0.24
2011-2012	57,512	117,102	3,805	9,816	0	0.67
Average	48,346	69,713	2,100	3,289	Ave Distance from KZO	3.22

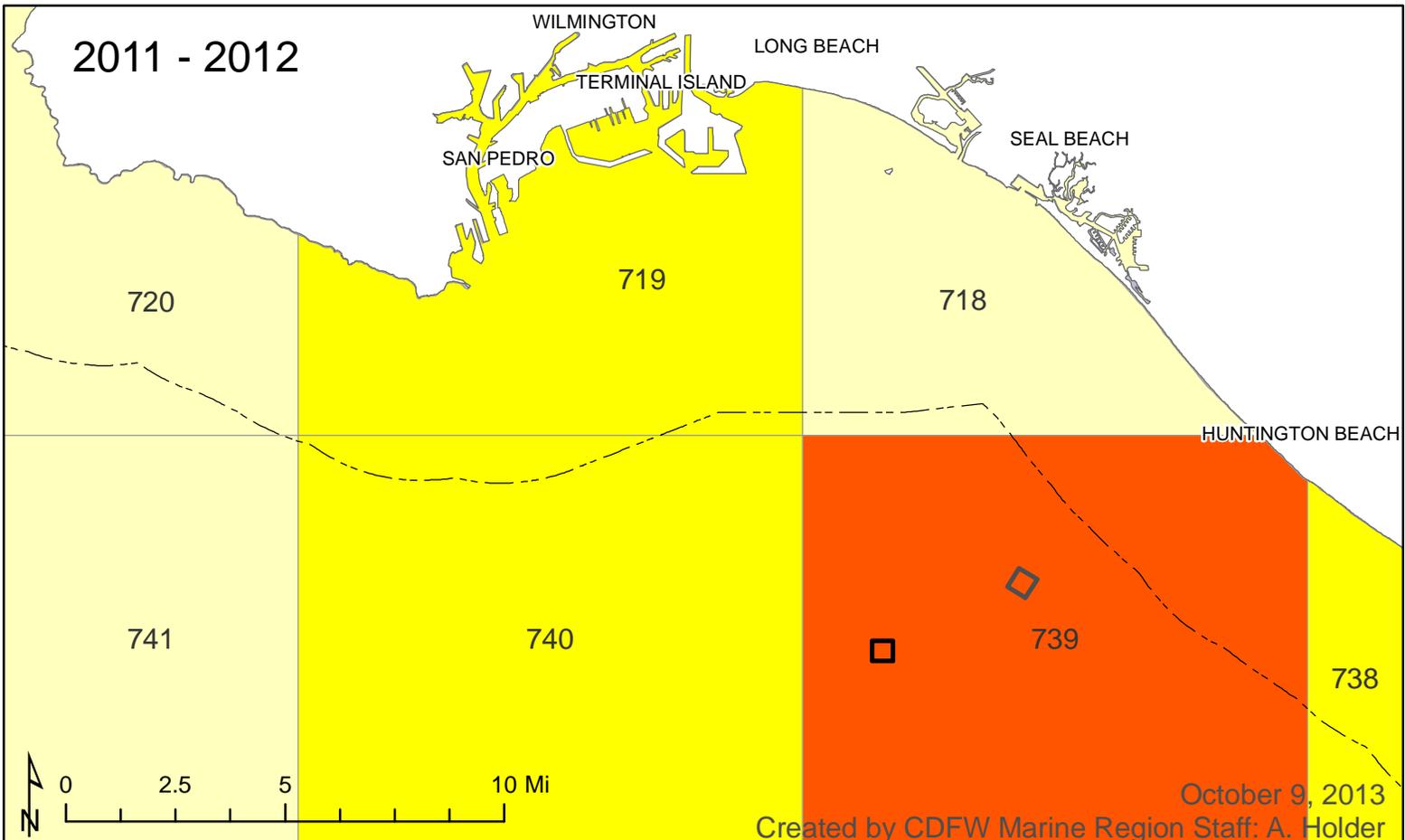
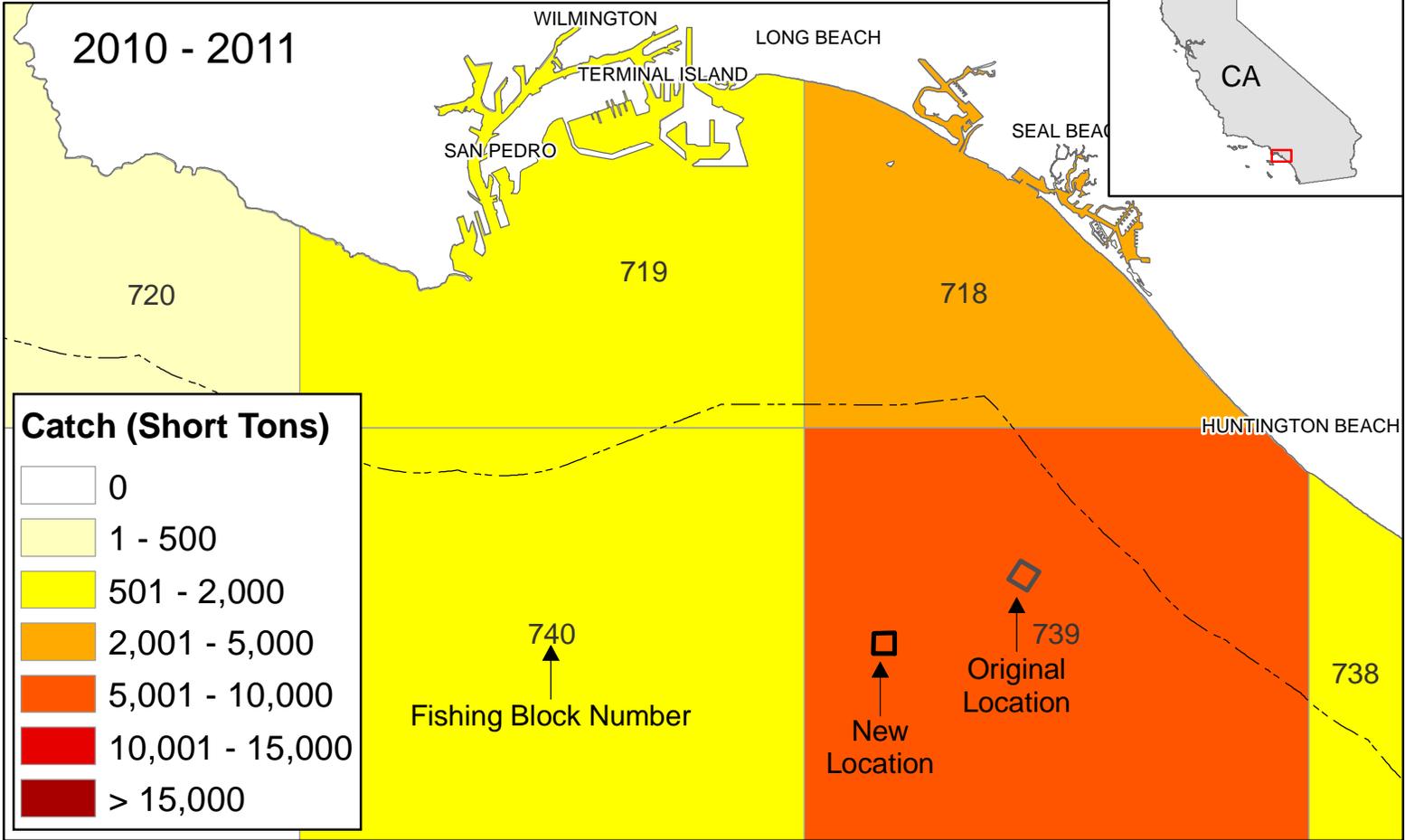
New Location

Fishing Season	Catch South of Pt. Conception		Catch in the San Pedro Channel		Logbook catch inside proposed KZO shellfish farm (Short Tons)	Closest Point (mi)
	Logbook Data	CFIS Data	Logbook Data within blocks 718,719,739,740	CFIS Data Blocks 718,719,739,740		
2000-2001	79,335	113,121	1,147	2,162	0	0.68
2001-2002	75,737	91,081	1,382	1,152	0	1.94
2002-2003	14,265	18,990	380	274	0	4.15
2003-2004	32,826	40,336	514	892	0	1.71
2004-2005	39,686	47,595	0	175	0	22.45
2005-2006	61,669	78,972	6,120	6,224	0	0.72
2006-2007	33,055	37,606	1,430	1,770	0	4.70
2007-2008	46,924	50,347	4,704	4,094	0	1.22
2008-2009	32,956	39,182	284	729	0	2.22
2009-2010	51,473	92,433	522	992	0	2.54
2010-2011	54,709	109,786	4,909	11,185	0	2.02
2011-2012	57,512	117,102	3,805	9,816	0	1.03
Average	48,346	69,713	2,100	3,289	Ave Distance from KZO	3.78

Market Squid CFIS Data by Fishing Season

San Pedro Channel

Commercial and Recreational Fishing Data from CDFW



October 9, 2013

Created by CDFW Marine Region Staff: A. Holder



Commercial and Recreational Fishing Data from CDFW

CPFV Block-Box Locations KZO Farms New Proposed Site

Jul 2004 - Aug 2011
Total record of block box
fishing locations- CPFV

-  Oil Platform
-  1 - 24
-  25 - 49
-  50 - 99
-  100 or more
-  KZO Farms Site 2
-  State Water Line

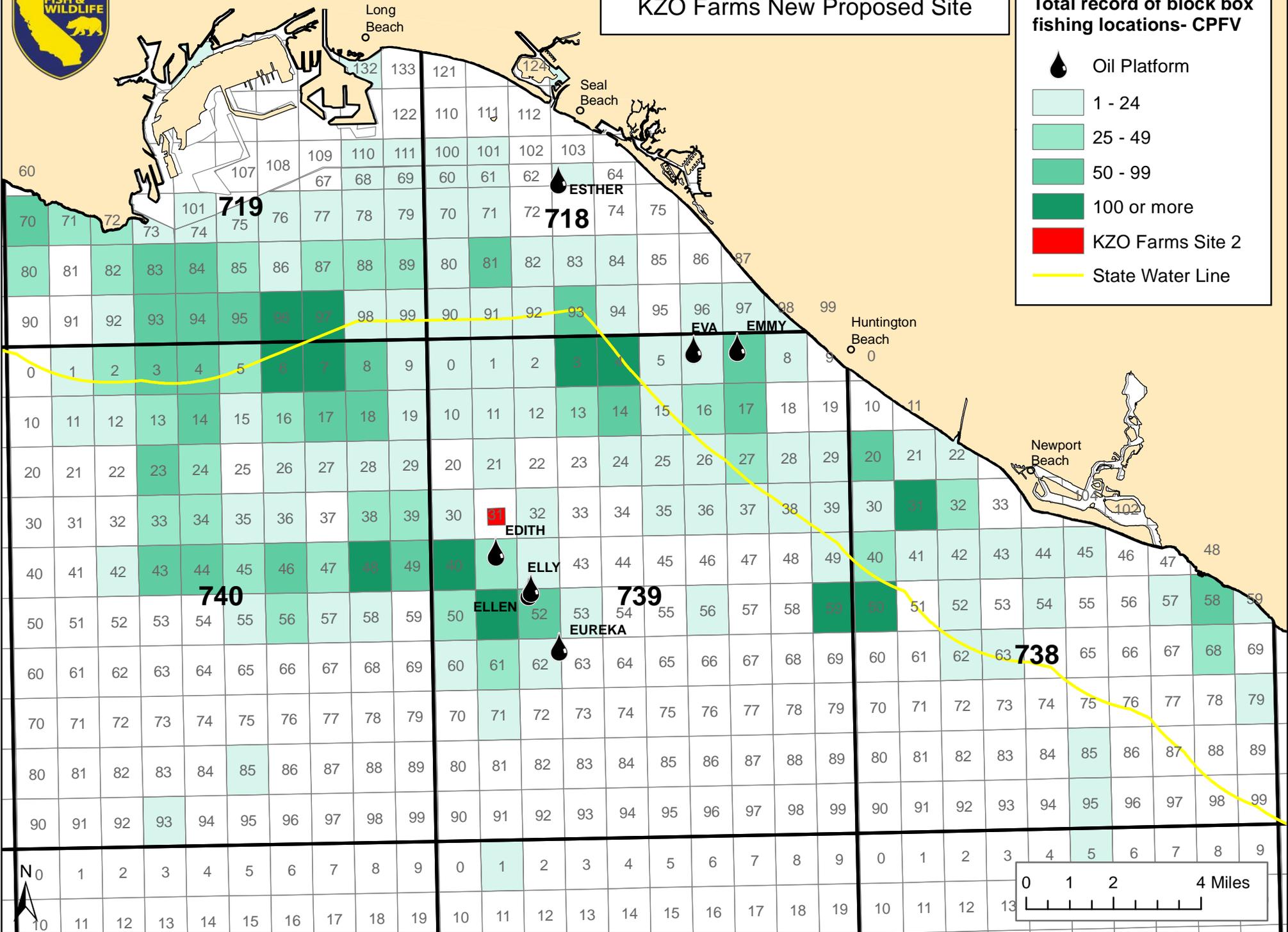




Figure 7 - Commercial and Recreational Fishing Data from CDFW

PR1 & PR2 Block-Box Locations KZO Farms New Proposed Site

Jan 2004 - Apr 2013
Total reports of block box fishing locations- PR1/PR2

- Oil Platform
- 1 - 24
- 25 - 49
- 50 - 99
- 100 - 249
- 250 - 499
- 500 or more
- KZO Farms Site 2
- State Water Line

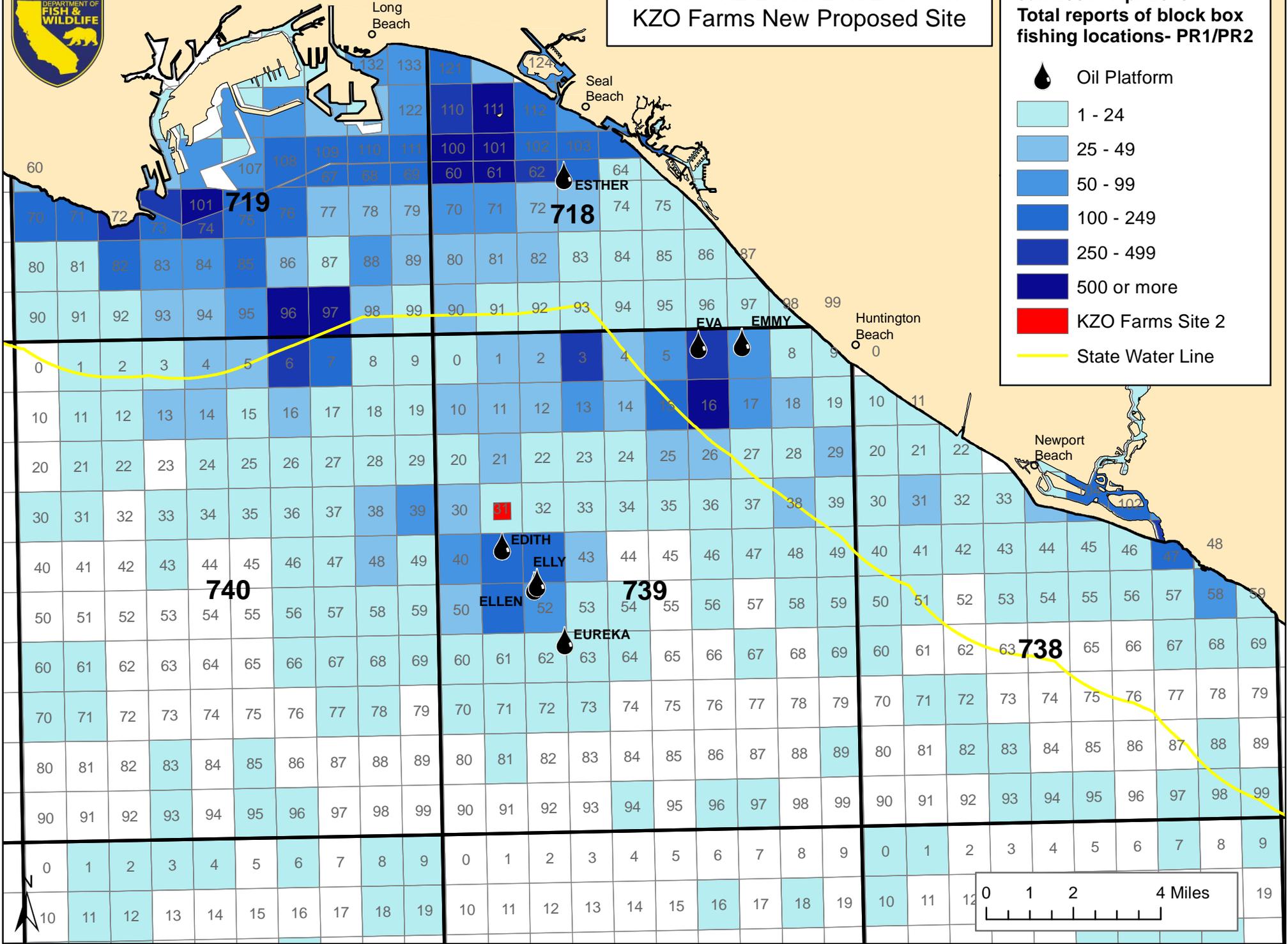


EXHIBIT 7 - Commercial and Recreational Fishing Data from CDFW

