Environmental Assessment

Proposed Issuance of a Permit to Authorize the Culture and Harvest of a Managed Coral Reef Fish Species (*Seriola rivoliana*) in Federal Waters West of the Island of Hawaii, State of Hawaii

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Abstract:

The National Oceanic Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is proposing to issue a Special Coral Reef Ecosystem Fishing Permit (SCREFP) to Kona Blue Water Farms (KBWF) for one year in accordance with the Hawaii Fishery Ecosystem Plan and consistent with implementing federal regulations (50 CFR §665.224) pertaining to management of coral reef ecosystem fisheries. The permit would authorize the culture and harvest of a Hawaii coral reef ecosystem Management Unit Species (MUS) using one 132m^3 (4,662 ft^3) untethered brass-link mesh cage (CuPod) deployed in Federal waters (generally from 3-150 nautical miles (nm) offshore) west of the Island of Hawaii. The proposed activity would allow the applicant to test the feasibility of raising marine fish species using a new gear-type (towed, floating pen) in the U.S. Exclusive Economic Zone (U.S. EEZ).

The applicant proposes to culture 2,000 fingerlings/juveniles obtained from a local fish hatchery that are the first generation offspring of the native Hawaii coral reef MUS, *Seriola rivoliana* (marketed as "Kona Kampachi®"). The CuPod would be deployed using a U.S. Coast Guard approved tender vessel that would maintain a controlled drift in the surface waters of the EEZ and in waters that are between 10,000 and 12,000 feet deep.

NMFS developed this environmental assessment (EA) to evaluate the potential environmental impacts of the proposed activity. The applicant has successfully cultured the fish species within a land-based hatchery and in net pens in State waters around Hawaii for the last decade. Permitting processes and public concerns relevant to the applicant's existing operations helped to inform this evaluation. The low stocking and rearing density of fishes, established procedures for application of feed, passive flushing and near constant movement in eddies in offshore waters area expected to reduce impacts on water quality and eliminate the need to use chemical treatments against diseases or biofouling. The metal mesh net pen design is designed to prevent fish escapes. In addition to the permittee monitoring the pod and vicinity, NMFS permit conditions would provide for reporting any protected resources interactions, fish mortality or escapes and transshipment reports. These operational features together with the limited scale and duration of the project result in the agency's analysis revealing no large and adverse environmental impacts to native fishes, marine mammals, seabirds, sea turtles, other marine species, or habitats.

In March 2011, a draft EA was developed and the public had an opportunity to comment. Comments from the public, along with project revisions submitted by the applicant following sea trials of the initially proposed two towed CuPod array were considered in the development of the environmental assessment. A copy of this environmental assessment and the decision document can be obtained by contacting the official above.

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List of Acronyms

EA	Environmental Assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FAD	Fish Aggregation Device
FCR	Feed Conversion Ratio
Hawaii FEP	Fishery Ecosystem Plan for the Hawaiian Archipelago
HAPC	Habitat Area of Particular Concern
HF	Hukilau Foods
HOT	Hawaii Oceanic Technology
IPCC	Intergovernmental Panel on Climate Change
KBWF	Kona Blue Water Farms (Kona Blue)
KPH	Keahole Point Hatcheries, LLC
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act/Magnuson-Stevens Act
MUS	Management Unit Species
NELHA	Natural Energy Laboratory of Hawaii Authority
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
PHCRT	Potentially Harvested Coral Reef Taxa
PIRO	Pacific Islands Regional Office
PMUS	Pelagic Management Unit Species
SCREFP	Special Coral Reef Ecosystem Fishing Permit
WPFMC	Western Pacific Regional Fishery Management Council (Council)
U.S. DOC	United States Department of Commerce
U.S. EEZ	United States Exclusive Economic Zone

1 Introduction

The National Oceanic Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) is proposing to issue a Special Coral Reef Ecosystem Fishing Permit (SCREFP) to Kona Blue Water Farms (KBWF) for one year in accordance with the Hawaii Fishery Ecosystem Plan and consistent with implementing federal regulations (50 CFR §665.224) pertaining to management of coral reef ecosystem fisheries. The permit would authorize the culture and harvest of a Hawaii coral reef ecosystem Management Unit Species (MUS) using one 132m^3 (4,662 ft^3) untethered brass-link mesh cage (CuPod) deployed in Federal waters (generally from 3-150 nautical miles (nm) offshore) west of the Island of Hawaii. The proposed activity would allow the applicant to test the feasibility of raising native marine fish species using a new gear-type (towed, floating pen) in the U.S. Exclusive Economic Zone (U.S. EEZ).

This EA was prepared to fulfill the requirements of the National Environmental Policy Act (NEPA) and in accordance with NOAA Administrative Order 216-6 and other agency NEPA policy. It will be used to evaluate the potential environmental impacts of the proposed activity and to inform the Regional Administrator in making a decision regarding permit issuance. Public comments on a draft EA were considered and this EA was revised to incorporate suggestions, address concerns, and clarify the proposed activity and scope of the action.

1.1 Purpose and Need

The issuance of a Federal permit would allow the applicant to demonstrate the feasibility of conducting fish culture in cages in Federal waters around Hawaii. The main objective of the proposed activity is to raise marine finfish to harvest size inside a specially designed cage while maintaining a controlled drift in the U.S. Exclusive Economic Zone (EEZ). The proposed activity is consistent with NOAA's aquaculture policy and priorities, which, among other priorities, support the development of innovative technologies and encourage the advancement of scientific knowledge about open ocean aquaculture in the U.S. (NOAA 2011).

In the fall of 2010, NMFS Pacific Islands Regional Office (PIRO) received an application from Kona Blue Water Farms, Inc. (KBWF or Kona Blue) for a Special Coral Reef Ecosystem Fishing Permit (SCREFP) to demonstrate the culture and harvest of a Hawaii coral reef ecosystem Management Unit Species (MUS) using offshore cages in Federal waters around Hawaii. A SCREFP is required if a vessel is to be used to harvest any Hawaii coral reef ecosystem MUS with gear not already identified in the governing regulations (50 CRF 665.224). Appendix A contains correspondence related to the permit application and Appendix B contains the governing regulations.

The Magnuson-Stevens Fishery Conservation and Management Act of 1976 (MSA) (16 U.S.C. 1801-1882) as amended, serves as the chief authority for fisheries management in the U.S. EEZ. NMFS is the agency within NOAA to which NOAA has delegated authority and stewardship duties of fisheries management under the MSA. Under MSA, "fishing" is defined as "the catching, taking or harvesting of fish;" "any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish;" and "any operations at sea in support of, or in preparation for, any activity described in" 16 U.S.C. 1802(16). NMFS' authority to regulate fishing in the US EEZ includes the taking, catching, and harvesting of cultured fish stocks in aquaculture, as well as other operations at sea that support those activities.

Several Regional Fishery Management Councils (RMCs) have approved FMPs for aquaculture, including scallops in the Northeast, live rock in the Gulf of Mexico and South Atlantic and finfish in the Gulf of Mexico. The Fisheries Ecosystem Plan for the Hawaiian Archipelago (Hawaii FEP) identifies the species being proposed for culture, *Seriola rivoliana*, as a coral reef ecosystem MUS. Since the proposed gear to harvest an MUS is not currently regulated as a listed gear under the Hawaii FEP for coral reef fisheries, a special permit (SCREFP) is required.

1.2 Comments and Revisions

1.2.1 Public Comments on the Draft EA

Public comment on the DEA was solicited for a 10-day period from March 17-27, 2011. A number of comments were received relating to the proposed activity, the application process, and potential impacts of open ocean aquaculture in general. Comments about the potential impacts of the proposed action, as well as about the process, were considered by NMFS as it finalized the EA. Public comments and NMFS' response to these comments are summarized in section 7.1.3.

1.2.2 Modifications to the Proposed Activity

As part of Kona Blue's research and development, sea trials were conducted to test the initially proposed gear (2 pods as described in the DEA) in March 2011, prior to stocking with fish. The initial proposal incorporated an innovative "hub" bridle design to tow the pod array. However, gale force winds and rough seas caused this untested design to fail near attachment points due to chaffing. Upon failure of part of the bridle system, both pods were extensively damaged by waves slamming them together, and one pod was subsequently scuttled for safety concerns. .

Following this unsuccessful attempt to deploy two pods as initially proposed, Kona Blue notified PIRO of modifications to the original plan. Because the loss was attributed to an engineering problem with the towing bridle that caused the pods to collide, the proposal was modified to reduce or eliminate the risk of another separation of the CuPod from the towing vessel. The revised plan, covered by this EA, would use the same overall concept as initially proposed, but incorporates the following changes:

1. A single, smaller CuPod would be deployed (Figure 3: one pen of 132 m^3 vs. the first sea trial which tested two pens of 212 m^3). This will reduce drag under tow, render the towing array less complex, and allow ready repositioning of the CuPod as needed.
2. The single, smaller pen will be stocked with fewer fish –2,000 fish at stocking, instead of the original plans for 6,000 fish. Feed would also therefore be reduced by about a third, and any other potential environmental impacts would be similarly reduced.
3. A hardened, multiple-attachment point tow bridle would be used (the proven system used extensively with similar pods elsewhere, vs. the innovative 'hubs' that were tested in the first sea trial and found wanting). This simplified mooring design would further minimize any potential for marine mammal entanglement (Figure 1).
4. Chafe point protection (chain or hose) would be installed on all lines near the CuPod and *Machias*.
5. The CuPod would be negatively buoyant without the floatation, so that it can be sunk if necessary (once the external float lines are removed).
6. The brass mesh would be chain-link, rather than woven, but is approximately the same size (Figure 5: the size is 1 inch square, vs. 1¼" square in the first sea trial).

7. The pen would be either (a) lifted mostly out of the water to reduce tow drag (using lift bags or ballast tanks), and/or (b) additional tow power shall be provided to ensure that the array can be readily towed to the desired station before being fully deployed.
8. Ballast weights would not to be added to the array until the Velella is on station. Ballast weights shall also be more hydro-dynamically designed, to reduce drag (i.e. use chain, not steel plate).
9. Float lines would be better secured on launch (canvas bags), to prevent tangling. Strobe-lights, radar reflectors and GPS transmitters shall be installed prior to launch, and will be separated from float-lines. Feed lines shall be added to the tow array only after deployment on station.
10. GPS-tracking of drogue buoy deployments shall be conducted for the two weeks prior to launch, to provide better real-time information on actual current movements.

This EA evaluates the offshore cage culture demonstration project proposed by Kona Blue which is reduced in scope from that which was described in the draft EA reviewed by the public. Most of the terms of the initially proposed permit remain the same, and while there were no significant changes to conclusions of the potential environmental impacts as a result of public comments, additional information and analyses were included to further analyze the potential effects of the proposed activity on the environment.

1.3 Proposed Federal Action

The federal action considered in this EA is the issuance of a SCREFP to KBWF for one year in accordance with the Hawaii FEP and implementing federal regulations (50 CFR §665.224) pertaining to management of Hawaii's coral reef ecosystem. The permit would authorize the culture and harvest of a Hawaii coral reef ecosystem MUS, Seriola rivoliana, which is classified within the Hawaii FEP as a Potentially Harvested Coral Reef Taxa (PHCRT).

The permit would allow the permittee, Kona Blue, to demonstrate the application of the *Velella Concept* (Fig. 1) in Federal waters. According to the permit applicant, the *Velella Concept* is named after a genus of free floating hydrozoans that live on the surface of the open ocean, and would involve culturing 2,000 hatchery-sourced fish in a drifting cage that would be towed behind a tender vessel. The tender vessel and pod are collectively referred to as the "velella array." The tender vessel that would be chartered to help control the drift of the CuPod is an 80-foot ocean going Staysail Schooner, the *SV Machias,* a U.S. Coast Guard documented sailing vessel with a commercial fishing endorsement. The CuPod would be stocked with *Seriola rivoliana* (Almaco jack) from Kona Blue's land-based hatchery using a support vessel capable of transshipping the fish to and from the shore and the velella array which would be located in EEZ waters. Additional supply vessels, such as charter, fishing or recreational vessels would be used intermittently to transport crew, provisions and feed for the fish during the course of the demonstration project as needed.

The scope of the permit would be to authorize the use of the 132m^3 (4,662 ft^3) CuPod and tender vessel to culture fish, as well as authorize the harvest and transshipment of the fish to and from the CuPod using a U.S. Coast Guard registered support vessel. The use or chartering of additional supply vessels to access the velella array for general purposes (e.g., safety reasons or crew transport), along with land based activities (hatcheries, harbors) associated with licensed aquaculture businesses are beyond the scope of the permitted activity and are not analyzed here.

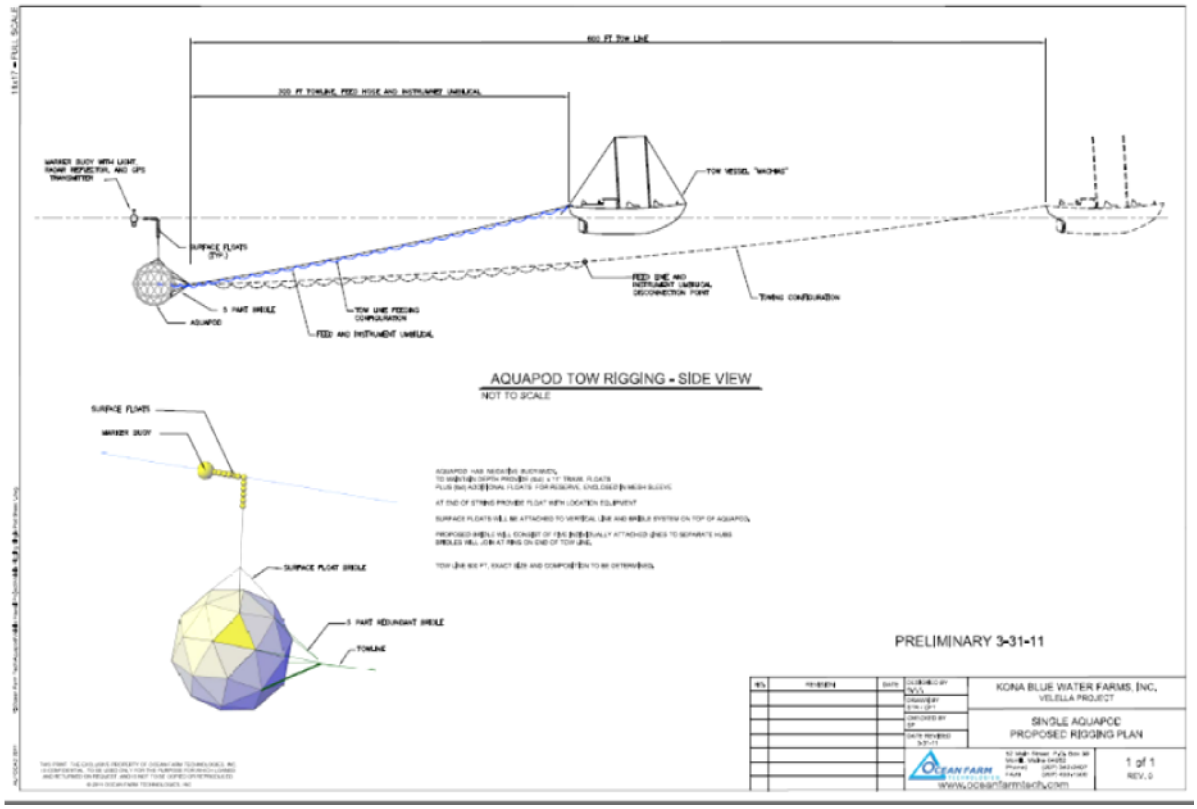

Figure 1. Technical details of the proposed 'Velella Concept.' (Source: KBWF 2011)

1.3.1 Action Area

Most of the permitted activities (culture and harvest) would take place in Federal waters. Transport of fingerlings from the hatchery to the CuPod at sea and transport of harvested frozen fish would involve activities on state roads and waters. Supply vessels including vessels transporting fingerlings and frozen fish would operate out of both Kawaihae and Honokohau Harbors in west Hawaii (see maps, Appendix E and F). All vessel traffic related to the permitted activity would transit State waters to access the Velella array within Federal waters.

The tender vessel towing the unstocked CuPod will depart from Kawaihae Boat Harbor and be towed to the three nautical miles (nm) from shore to Federal waters. Launching and testing of the CuPod gear without fish is not part of the proposed action since these activities do not require a federal permit. Once in federal waters, the culture and harvest test phase (stocking of the fish) is planned to take place between 156° W. long and 158° W. long and 20° N. lat and 19° N. lat (see Fig. 2). The exact course would depend on the oceanic conditions (currents, wind, natural eddies) as described in detail in section 3.2, below.

Once under way, the tender vessel and stocked CuPod would be in constant motion either by wind, wave and current or under power. The plan is to position the array within eddies in Federal waters that are between 10,000 and 12,000 ft deep (Calil et al., 2008). The array would be operated and lighted according to Coast Guard regulations (46 CFR §170 and 46 CFR §28). KBWF intends to maintain the CuPod in a manner that it is away from the tops of seamounts and deep sea banks that tend to be

frequented by recreational and commercial fishers. Kona Blue would also be careful to steer clear of any State Fish Aggregation Devices (FADs) that may exist in or near the action area to avoid conflicts fishermen or other ocean users. The captain of the tender vessel would use a combination of ocean charts and sophisticated satellite communication to avoid these areas.

In moving between Kawaihae Harbor and the desired location in federal waters, the transport vessels would briefly transit across the Hawaiian Islands Humpback Whale National Marine Sanctuary (see map, Appendix F), but this would involve few vessel trips with small motorized vessels, and the activity would not be different or more intense than the typical maritime traffic that is already occurring in and out of the harbor. The harbor, itself, is excluded from the sanctuary (Sanctuary boundaries are described at 15 CFR §922.181(b)).[1] The transshipment of fish from the harbor to the EEZ would be accomplished with a support vessel equipped with bait-tanks, similar to a fishing vessel. Both Kawaihae Harbor and Honokohau Small Boat Harbor, north of Kona, would be utilized by support and supply vessels.

Uses of the harbors to support the demonstration project would be performed at a level that is similar to normal everyday harbor activities. These activities would include storage of supplies, moving supplies, equipping vessels, tending gear, staff rotations, and transferring fish).

The Kaloko-Honokohau National Historical Park, administered by the National Park Service (NPS) encompasses waters immediately outside of the harbor and park lands surround the Honokohau Small boat harbor (see map, Appendix E). The proposed permit activity would not affect lands or cultural resources to either side of the harbor and vessels would transit park waters in much the same manner as other vessels already using the harbor and adjacent waters.

The hatchery facility that Kona Blue would use as a source of fingerlings operates licensed hatchery facilities within the Natural Energy Laboratory of Hawaii Authority (NELHA). Transport of fingerlings on roadways would be done using closed tanks placed on the back of trucks that are of a type and size that are ordinarily operated on roadways. These closed tanks would be loaded directly onto the supply vessels. Stocking and harvest transportation activities would not involve a large number of trucks or trips that would disrupt traffic either on roadways or at harbor facilities.

[1] http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=9d6329b754a250b3fd6457fe9c28c61b&rgn=div6&view=text&node=15:3.1.2.2.11.17&idno=15

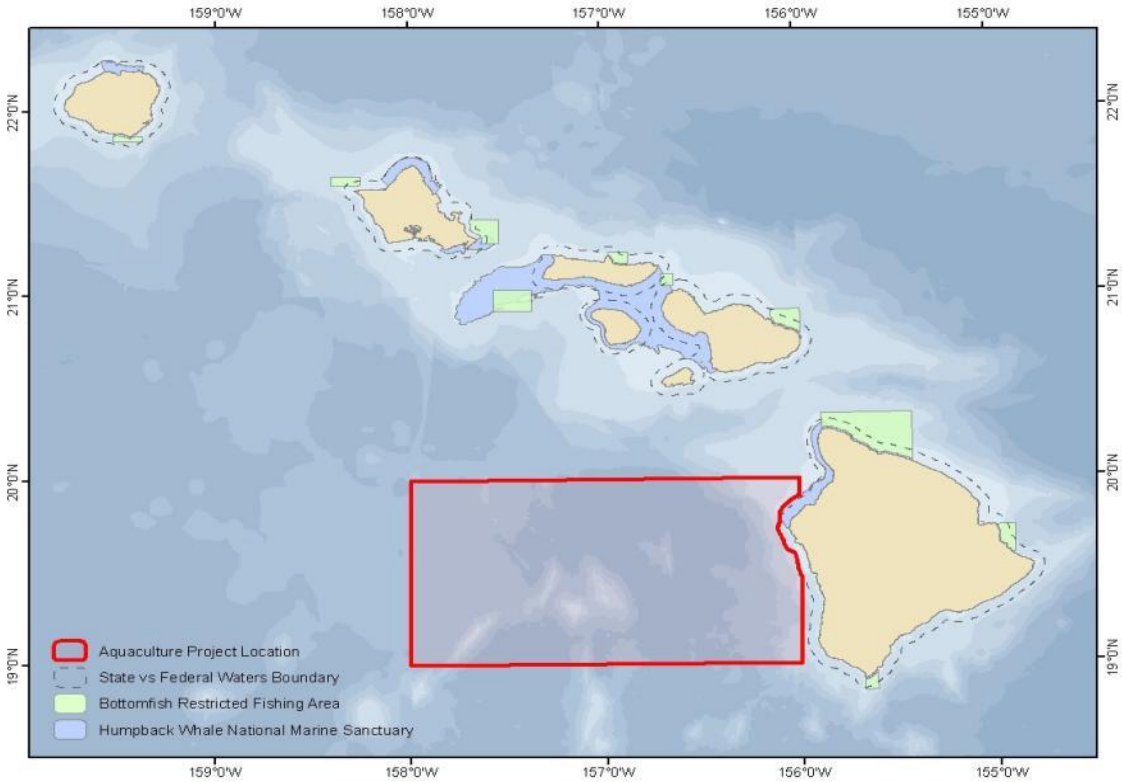

Figure 2. Proposed action area for the Velella Concept. (Source: PIRO 2011)

1.3.2 Technical and Operational Characteristics of the Velella Concept

The CuPod that would be used for the demonstration project has a volume of 132 m^3 (4,662 ft^3), a diameter of 6.4 m (21 ft) and is intended to be submerged to a predetermined depth during normal operations by means of a float line and ballast tanks (see Figs. 1, 3 and 4). The CuPod can be raised and lowered in the water column for stocking and cleaning (i.e., manual scrubbing and/or pressure washing) purposes using compressed air to displace sea water in ballast tanks attached to the pen. The spherical, geodesic CuPod consists of structural-plastic framing with rigid, brass chain-link enclosure panels that are engineered to minimize biofouling, tearing, entanglements and the ability for fish to escape (Fig. 5). Access to the inside of the CuPod would be through a hatch built into the topside of the cage. The top portion of the CuPod can be raised above the surface of the water to prevent fish escapes during divers' entries and exits.

Figure 3. Velella array with CuPod in tow (rear view). (Source: KBWF 2011)

Figure 4. Velella array with CuPod in tow (front view). (Source: KBWF 2011)

Figure 5. Rigid brass chain-link mesh of CuPod. (Source: Kona Blue 2011)

Overview of proposed operations

With the CuPod at sea, fingerling/juvenile fish would be obtained from a hatchery at Keahole Point and transported on public roadways in oxygenated tanks on trucks. Fish would be transferred to the support (e.g., transshipment vessel) vessel by loading the fish tanks onto the deck of the transshipment vessel, similar to that used to transfer fish to offshore pens located in State waters. During stocking and harvesting, support and supply vessels would be expected to traverse between the harbor and the CuPod array, which will be located in federal waters, to transfer the fingerlings. None of the operations are expected to cause traffic congestion on the roadways or at the harbors due to the relatively small number of fish that will be stocked (compared to what is usually stocked for existing aquaculture operation in State waters) and the limited numbers of transshipment trips required to carry out the proposed demonstration project.

While stocking the CuPod in federal waters the hatch would be above water (e.g., the CuPod would be raised to the surface) to minimize fish escapes that have been known to occur with subsurface fish transfers. Fish would be transferred into the CuPod through the hatch on the top of the CuPod using scoop or surround nets and/or specially designed fish pumps. Once stocked, the top hatch would be secured and the CuPod would be submerged so that the top of the cage would be approximately 7.6 m (25 ft) below the surface of the sea to limit effects from surface waves, currents and/or weather anomalies on the CuPod. Actual depths could vary slightly as ocean conditions would be monitored regularly to gauge the most efficient float depth for the CuPod.

Tension would be actively maintained on the tow lines and surface floats to the greatest degree possible. Lines with weights attached would be used to stabilize the CuPod as needed. The CuPod would be equipped with a surface buoy float-line attached at the top to keep the submerged CuPod at the specified depth (Fig. 2). A GSP transmitter and radar reflector would also be attached to the CuPod prior to stocking so in the event of detachment from the tender vessel the CuPod could readily be located. The array would be operated, marked and lighted according to Coast Guard regulations. Underwater cameras

would be used to monitor the CuPod while submerged. In the event that the CuPod should become detached from the float line or the tender vessel and if the ballast tanks were deflated at the same time, the CuPod would most likely sink to the bottom and the fish inside the cage would remain inside and the stock would not be expected to survive or escape into the wild. At the expected depth of 10,000 to 12,000 feet, the CuPod and the fish inside would most likely be unrecoverable from the ocean bottom. If the CuPod were to become detached from the tender vessel but remain afloat, Kona Blue would be obligated, under terms of the permit, to contact the U.S. Coast Guard and a responsible NOAA official to report the accident and any navigational hazard therein. Regardless of outcomes of a catastrophic detachment, damage from the pod and retrieval would remain the responsibility of Kona Blue Water Farm. Additional information about the potential impacts from pod loss may be found in section 4.15.

Raising and maintaining the stock within the CuPod would be carried out by project staff living and working aboard the tender vessel. Feeding the stock would be accomplished through a hose that would extend from the tender vessel to the CuPod. Initially, the stock would be fed five times a day (less often as the fish grow) to near satiation through the feed hose into which a feed/sea water slurry would be pumped into the submerged CuPod (see Fig. 1). There are no prophylactic antibiotics or other medications in the feed, and the feed pellets include various agricultural products (e.g., soybean) formulated with approximately 20% fish meal and 10% fish oil from, according to the supplier, sustainable sources. Staff and researchers with diving experience, along with the monitoring cameras would observe the fish and the activity around the CuPod on a regular schedule. Monitoring with cameras would also help aid the staff to identify any fish, sharks, turtles and marine mammals that may be present around the CuPod for safety, maintenance and research purposes.

Even under the best-case scenarios, some of the fish that are stocked will not survive. Based on previous experience and research, Kona Blue expects the survival rate to be around 80% of the numbers stocked. So, from an initial 2,000 fish stocked, the final harvest is expected to be approximately 1,600 fish. To avoid discarding dead fish into the ecosystem, fish that do not survive the entire grow-out phase would be removed from the CuPod, as a condition of the permit. Fish mortalities would be recorded, frozen, and then transported back to Kona Blue's land-based facility for examination; no fish, dead or alive, would be intentionally put into the ocean.

Information collected from other larger commercial aquaculture net pen operations in State waters indicate that concentrations of waste products around fish cages in the open ocean would, in the case of the CuPod, likely be limited or unmeasurable due to the small amount of stock biomass, the carefully applied amounts of food, the nutrient-poor nature of the deep ocean and its nutrient assimilation capacity, and the constant drift of the CuPod through the open ocean, ultimately resulting in large volumes of water passing through the pen to dilute fish metabolites (Hukilau Foods 2009, KBWF 2009). The amount of fish proposed to be cultured under the proposed activity (approximately 8,000 lb, is significantly below the 100,000 pound limit that requires a National Pollutant Discharge Elimination System (NPDES) permit (40 CFR 122.24c), and is equal to less than 1% of the total annual production of *Seriola rivoliana* that has previously been raised at Kona Blue's existing offshore aquaculture facilities permitted in State waters.

1.3.3 Culture and Harvest Details

Seriola rivoliana (kahala, greater amberjack)[2,3] is an indigenous species of amberjack, known as the Almaco jack, that is relatively common in Hawaiian waters and has a roughly circumtropical distribution.

[2] http://www.fishbase.us/Summary/speciesSummary.php?genusname=Seriola&speciesname=rivoliana
[3] http://www.worldwildlife.org/what/globalmarkets/aquaculture/seriolaandcobiadialogue.html

The wild jacks in Hawaii are typically caught as bycatch in association with trolling and bottomfishing. There is no commercial fishery for this species in Hawaii due to the occasional occurrence of Ciguatera toxin, and large aggregations of parasitic worms in the flesh of wild-caught animals. Fishermen regularly discard this species and reliable population estimates of the species are not available. The fact that this species of fish is not targeted or kept is expected to result in larger population sizes for this species in the wild compared to those species that are commercially valuable and that are regularly harvested from the wild. In addition, for management purposes, wild *Seriola rivoliana* caught in Hawaiian waters have historically been logged in fishermen's' catch reports as "Kahala", which lumps the fish with other species of jacks and could also undermine an accurate assessment of the stock at the species level. For example, another species of the amberjack family that is commonly recorded as "Kahala" in catch logs is *Seriola dumerili*.[4,5] *Seiorola dumerili* is listed as a bottomfish MUS in the Hawaii FEP. Generalizing the genus as Kahala in this way adds to the difficulty in understanding interspecies relationships and catch rate differences between distinct *Seriola* populations found in the region (WPFMCWPFMC, 2011). Nonetheless, both species in the wild are often regarded as bycatch in Hawaii and no commercial fishery exists that is dedicated to either species of amberjack.

According to Kona Blue (2010) cultured kahala have a higher fat content (a highly desirable market characteristic) than wild fish since they are confined, fed regularly, and utilize less energy in the daily search for food. Also, cultured kahala may be distinguishable to experienced kahala fishermen because they tend to have a thicker and rounder body than wild fish. However, should the cultured stock escape, fish are likely to quickly assume the body shape of wild fish due to the greater difficulty of finding food in the wild. While tagging or marking fish would be ideal for research purposes, such a program would require a coordinated outreach effort by scientists, managers, fishermen and the support of the aquaculture industry.

Kona Blue does not propose to harvest wild stock for this project. Instead, the applicant would use first-generation fingerlings reared from wild-caught brood stock in a land-based hatchery which has commercially cultured this species since 2005 at Kailua-Kona, Hawaii. The hatchery currently cultures this species for use in the offshore net pens located in waters leased from the State (KBWF 2009). Under the proposed activity, the CuPod would be stocked with 2,000 fingerlings at about one pound each supplied from Keahole Point Hatcheries, LLC (KPH) located at the Natural Energy Laboratory of Hawaii Authority (NELHA) at Kailua-Kona, Hawaii. The fingerlings would be transported from the hatchery to Honokohau harbor for transshipment to the CuPod. Following the transfer of fish, the tender vessel and stocked CuPod would begin a continuous drift in Federal waters. Toward the end of the 8- to10-month grow-out cycle, the average fish weight at harvest is anticipated to be approximately four pounds each (8,000 lb total). In the final stages of the proposed activity, the CuPod would be brought to the surface within the EEZ to facilitate harvest of fish using a seine to scoop fish out of the CuPod and place them on ice for transshipment to shore side facilities using a support vessel. Harvest of the cultured stock from the CuPod will be logged during transshipment and reported, as required under the terms of the SCREFP. No fish processing would occur at sea. KBWF intends to sell the harvested biomass, anticipated to be around 8,000 pounds of fish, through existing distribution channels under its established brand, Kona Kampachi®.

1.3.4 Species Choice and Stocking

[4] http://hawaii.gov/dlnr/dar/pdf/fishes_of_hawaii.pdf
[5] http://www.fishbase.org/summary/SpeciesSummary.php?genusname=Seriola&speciesname=dumerili
Found in deep seaward reefs; occasionally entering coastal bays. Feed primarily on fishes such as the bigeye scad, also feeds on invertebrates. Small juveniles associate with floating plants or debris in oceanic and offshore waters. Juveniles form small schools or solitary. Reported to cause ciguatera in some areas.

The test of the Velella Concept would utilize the same indigenous species that is grown at KBWF's State ocean lease site off Kailua-Kona, Hawaii, the Almaco jack, *Seriola rivoliana*. KBWF has grown and marketed up to one million pounds a year of this fish over the past five years with no major environmental impacts, as documented though extensive monitoring of the existing net pen systems (KBWF 2009). Kona Kampachi® has been successfully sold in Hawaii, other U.S. states and countries (e.g., Japan) and is regarded as a premium quality, cultured product.

1.3.5 Feeds and Feeding

The feed used in this test is the same specially developed feed formulation that is used at KBWF's ocean lease site in State waters. The feed is produced by Skretting, Inc. in Canada, which is a leading producer of aquaculture feeds and the ingredients are comprised of sustainably harvested ingredients according to the manufacturer (Skretting 2010). The feed pellets are composed of fish meal (20%) and fish oil (10%), and agricultural oils and proteins such as soybean meal, corn gluten, wheat gluten, canola oil, poultry meal and poultry oil. There are no prophylactic antibiotics or other medications included in the feed that would be used.

Fish would be fed daily through a 3-in diameter hose from the tender vessel that would pump a seawater-and-pelleted food slurry into the submerged pen. Initially, the small fish would be fed five times a day, but as they grow, they would be fed less frequently. Fish would be fed each time at a level just below satiation to assure minimal feed is wasted.

It is anticipated the tender vessel can carry six months of feed and would have to be restocked by supply vessels and/or the tender may need to return to Honokohau harbor for additional feed once during the course of the test. Another smaller vessel would take up station with the CuPod if the tender would need to return to port (e.g., the CuPod would remain tended to in federal waters).

1.3.6 Additional Characteristics of the Proposed Activity

Research has been done by Kona Blue to monitor and determine the oceanographic conditions in the proposed action area, including, but not limited to, various National Science Foundation (NSF) funded grants and university supported research. The proposed project includes research monitoring of the aquaculture portion of the project. Research support for the proposed demonstration project would come from the University of Hawaii's through its various aquaculture programs.[6,7] This small-scale, beta-test trial of the Velella Concept is designed to gain insight into the viability of this gear and harvest method and to provide information on potential environmental impacts of future open ocean aquaculture projects. Central to the testing of the Velella Concept is for the CuPod to maintain a controlled drift while attached to the tender vessel. Both the CuPod and the tender vessel would be moved through the action of ocean currents and surface winds. The array would be retained within and pushed along by the ocean eddies known to be present in the area. Exact positioning in the eddy would be maintained by the tender vessel using access to a remote sensing satellite and frequent communication with onshore operations. The general approach would allow the array to remain close to the center of the eddy when it the eddy is near t the Island of Hawaii (always outside of 3 nm). Then, as the eddy shifts farther westward, the array would be actively towed (under sail or power) into the outer edges of the eddy, so that it can exit the eddy and move into the next eddy when it forms. This would allow the array to maintain a desired position (e.g., in the action area). Studies indicate cyclonic eddies (Fig. 7) form off the leeward coast of Hawaii every 50 to 70 days (Calil et al. 2008; Dickey et al. 2008).

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[6] http://pacrc.uhh.hawaii.edu/
[7] http://seagrant.soest.hawaii.edu/sites/seagrant.soest.hawaii.edu/files/publications/sustainable_seafood.pdf

The tender vessel would be provisioned about once a week as the array drifts closer tithe eastern boundary of the action area in federal waters, or when restocking of the feed or crew changes are necessary. Supply vessels visiting the array will be less frequent when the array drifts further from the Island of Hawaii. Visits to the array in federal waters would be accomplished on smaller power boats (e.g., 25-45 ft in length) that would originate from either Kawaihae or Honokohau small boat harbor.

Although not part of the proposed Federal action, KBWF would collect data on the track that the array takes during the operation, the time and fuel costs required to maintain the array in a desirable location in a selected ocean eddy, and growth performance and health of the stock during the trial. Kona Blue would be working closely with the University of Hawaii to conduct a third party monitoring and collection program, similar to their operations in State Waters. Data collection would also include observations on a daily basis of any marine mammals, sea turtles, and bird life around the array, as well as fish species that may aggregate around the tender vessel and CuPod and any boat traffic that is seen. In accordance with FDA requirements, aquaculture enterprises require reporting of disease problems and notification prior to in-water treatments to proper officials and this is the case for Kona Blue.

In addition to these data, there is certain information that would be required as a condition of the special permit and that must be recorded on two special forms obtained from the NOAA Fisheries Service, PIRO, which would be adapted for this test (Appendix C). This information includes environmental data, comments on any gear loss, escapes, stock diseases, mortalities, numbers harvested and observations of protected species.

1.3.7 Maintenance and Security

The CuPod would be maintained by experienced KBWF dive staff aboard the tender vessel. Divers would utilize small boats to access the pen and enter and leave the pen interior through the top hatch previously discussed. The pen, rigging and stock would be inspected daily for data collection, wear and tear on the equipment, and fish mortalities, which would be removed and frozen for later examination. Repairs would be made at sea as needed, with diver safety being the first priority for any specific operation and for the entire test period. Other maintenance, such as periodic manual net cleaning (e.g., power washing with water), is expected to be minimal since the array is in open-ocean and constantly moving water.

The CuPod would have surface floats to mark its position at all times, particularly as a navigational precaution for any boats that may approach the CuPod-tender vessel array. In addition to diver inspections and surveillance from the stern of the tender vessel, the CuPod would be equipped with cameras for constant observation of the equipment, the stock and for safety reasons. The CuPod would also be equipped with a light, GSP transmitter and radar reflector, so in the event of detachment it would be visible for navigation and be retrieved.

1.3.8 Socio-cultural Characteristics

Area affected

Areas associated with the proposed demonstration project that exist outside of the action area in federal waters include: 1) Kawaihae Commercial Harbor, in West Hawaii to support launch of the array, general supply vessels; 2) Honokohau Small Boat Harbor, Kona, also used to support transshipment and supply vessels; and, 3) State waters between the harbors and the action area. All support vessels, along with the tender vessel with CuPod in tow, will only briefly transit State waters during transport of crew, loading

and unloading of fish, and feed and supply provisioning. The permitted activities related to culture and harvest operations addressed in this EA will be conducted in Federal waters.

Arrangements for carrying out the activities at Kawaihae and Honokohau Harbors would be made by the permittee in coordination with the Harbor Master for the duration of the project. Project activities are not likely to adversely affect the use of the harbor by other patrons or the public beyond normal harbor use. Actively managed coastal sites and culturally significant areas that exist near the harbors are described further in section 4.13 (See also Appendix E).

1.4 U.S. Seafood Supply and Demand Trends

The need for this action is supported by the increasing reliance of American producers and consumers on imported seafood products. NOAA's Aquaculture Program estimates total aquaculture production in the U.S. at around $1.2 billion, with marine aquaculture contributing to 25% of that supply. For comparison, NOAA estimates the world aquaculture production (freshwater and marine) to be near $70 billion. Of the total U.S. aquaculture production, 5% supplies U.S. seafood demand, with only 1.5% of that attributed to marine aquaculture. Hence, to satisfy growing domestic demand, the U.S. imports 84% of its seafood, half of which is from aquaculture production from far reaches of the globe. The result is an annual seafood trade deficit of $9 billion (NOAA 2011). Furthermore, recent studies have suggested that U.S. dependence on seafood imports poses uncertainty and risk over the long-term due to increased pressures on wild stocks to meet a growing global demand along with the high volatility of the international marketplace for seafood products (Anderson and Shamshak 2008, FAO 2009, Corbin 2010).

The U.S. Department of Commerce (U.S. DOC) and NOAA have recognized these challenges and are focusing greater effort on developing and encouraging sustainable ocean farming of fish and shellfish (U.S. DOC 2007; NOAA 2008). Both the DOC and NOAA have finalized a National Aquaculture Policy. The draft NOAA policy was released for public comment on February 9, 2011 and the policy was finalized on June 9, 2011 (NOAA 2011a). The policy emphasizes protection of wild species and decisions based on sound science. It encourages economic growth and employment opportunities in the U.S. and of enhancing U.S. competitiveness within global aquaculture markets. Likewise, the Western Pacific Regional Fishery Management Council has also recognized the growing potential of aquaculture to seafood in the region and is currently finalizing a Regional Aquaculture Policy for the Western Pacific (WPFMC 2009a).

According to the National Agricultural Statistics Service (NASS), aquaculture in Hawaii totaled $32.3 million in 2009.[8] The Hawaii Department of Agriculture's Aquaculture & Livestock Support Services (ALSS), formerly the Aquaculture Development Program, ranks aquaculture in Hawaii as the third highest valued agricultural activity for 2009, equaling 6.6 percent of the State's total diversified agricultural productivity, ahead of macadamia nuts, coffee and cattle. Finfish sales by weight were valued at $4.4 million, or 14% of domestic aquaculture production. Sales from other aquaculture products from Hawaii include algae (53%), shellfish (1%), ornamental (8%) and 'other' (24%), including seed stock and brood stock. In total there is estimated to be 70 aquaculture operations in the State of Hawaii, while 14 of those operations account for 75% of the total value.[9] Despite a strong aquaculture presence, Hawaii still imports 75% of its seafood to satisfy demand. Aquaculture in Hawaii is recognized as one of the most likely agricultural industries with the potential for economic growth given low marginal production costs, local support facilities (e.g., research, hatcheries) and ideal oceanic conditions suitable for offshore development.

[8] www.nass.usda.gov/hi
[9] Includes aquaculture operations with annual sales of $1000 or more (ALSS, 2011)

The proposed permit is not intended to result in large-scale seafood production, but would allow the applicant to evaluate the performance of the innovative gear-type and make refinements that would benefit decisions about, and investments in, future production facilities locally, nationally and globally.

2 Description of Alternatives Considered

2.1 Alternative 1: No Action

This alternative involves not granting the one-year SCREFP to test the Velella Concept. Failure to carry out this limited duration activity would delay the potential successful demonstration of the proposed gear-type, culture and harvest method to produce fish in the U.S. EEZ.

Under the no action alternative there would be no activity to analyze, manage, or mitigate environmental consequences. However, not conducting this small-scale test would inhibit both NOAA and the private sector applicant from collecting data and providing insights for policy development or enable the assessment as to whether the proposed concept could be utilized to address the growing reliance on seafood imports by the U.S.

2.2 Alternative 2: Issue a Permit to Kona Blue to Demonstrate the Offshore Cage Culture of *Seriola rivoliana* in the U.S. EEZ

NMFS would issue a one-year Special Coral Reef Ecosystem Fishing Permit (SCREFP) to carry out the proposed culture and harvest of a managed MUS using a CuPod measuring 132 m^3 (4,662 $ft^{3)}$ to be towed in a controlled drift within federal waters off the west (leeward) coast of the Island of Hawaii.

2.3 Alternative Considered But Not Analyzed in Detail

Experimental, or exempted, fishing permits (EFPs) have been issued for aquaculture activities in U.S. waters authorized under FMPs. NMFS PIRO considered authorizing the proposed activity under either an EFP or a SCREFP. However, upon further analysis it was determined that a special use permit, or SCREFP, would be applicable to the proposed activity since the species being cultured is associated with a specific MUS (*Seriola rivoliana)* in the Hawaii FEP. As well, regulations governing an EFP are similar in process to those defined under a SCREFP, and NOAA's Aquaculture Policy supports the regional development of aquaculture, as managed under respective FMPs/FEPs. As NMFS PIRO determined the special permit for coral reef fisheries (SCREFP (50 CFR §665.224) is the appropriate authorization required for the proposed activity, the issuance of an EFP is not further analyzed in this EA.

3 Affected Environment

3.1 Regional Setting and Climate

The test project would be carried out in Federal waters of the U.S. EEZ on the leeward side of the Island of Hawaii, State of Hawaii, between 156° West longitude and 158° West longitude and 20° North latitude and 19° North latitude (Fig. 2). The tender vessel and net pen array would be operated between 3 and 150 nm from the coast, after departing from Kawaihae Harbor in West Hawaii. Water depths in this area of Federal waters average 10,000 to 12,000 ft in the deepest areas, though there are several seamounts and deep banks that rise from the ocean floor (Figure 8). Notably, water depths drop off quickly west of Hawaii, with the coral reef habitat extending approximately 0.54 nm from shore at its widest point (Coyne et al. 2003).

The prevailing weather pattern throughout the Hawaiian island chain is northeast trade winds, which blow around 80% of the time at average speeds of 8 to 12 kt. Kona winds, where the direction is from the southeast or southwest, occur about 20% of the time (Juvik and Juvik 1998). On the Island of Hawaii, Mauna Loa and Mauna Kea provide some shelter and reduce the intensity of wind, rain and seas generated by trade winds, making coastal waters of south-facing shores attractive as sites for offshore aquaculture. The planned test would take place in open ocean waters but would still be in these semi-sheltered lee areas off of Hawaii.

3.2 Ocean Setting

State marine waters extend to 3 nm and the U.S. EEZ extends from 3 nm to 200 nm. The test area in the lee of West Hawaii encompasses approximately 7,200 sq nm. Surface water temperatures vary between 18°C to 28°C (64°F to 82°F) over the year and the depth of the mixed layer can vary between 400 ft (122 m) in winter and 100 ft (30 m) in summer (WPFMC 2009b).

The area was chosen because of the oceanographic characteristic that major mid-Pacific current systems (i.e., the North Equatorial Current, the Hawaii Lee Current, and the Hawaiian Lee Counter Current) impacting the Island of Hawaii consistently form eddies, which rotate clockwise or counterclockwise as they spin off in a westward direction and eventually dissipate (Figs. 6 and 7). Eddies can be described as generally short- to medium-term water movements that spin off the surface currents and can play important roles in regional climate (e.g., heat exchange), as well as distribution and abundance of marine organisms (WPFMC 2009b). In this area of the ocean, eddies form consistently every 50 to 70 days (Calil, et al. 2008; Dickey, et al. 2008).

The Velella Concept includes using the energy in the eddy to push along the array and using the sail and diesel power of the tender vessel to optimally position the array in the eddy. The general approach would be to stay close to the center when the eddy is 3 nm or more from the Big Island and outside the Whale Sanctuary, then as the eddy moves away, start to move the array to the outer edges, so it can exit the eddy and wait for the next one to develop. In this way, the array would be in constant motion but would not move too far west for logistical efficiency.

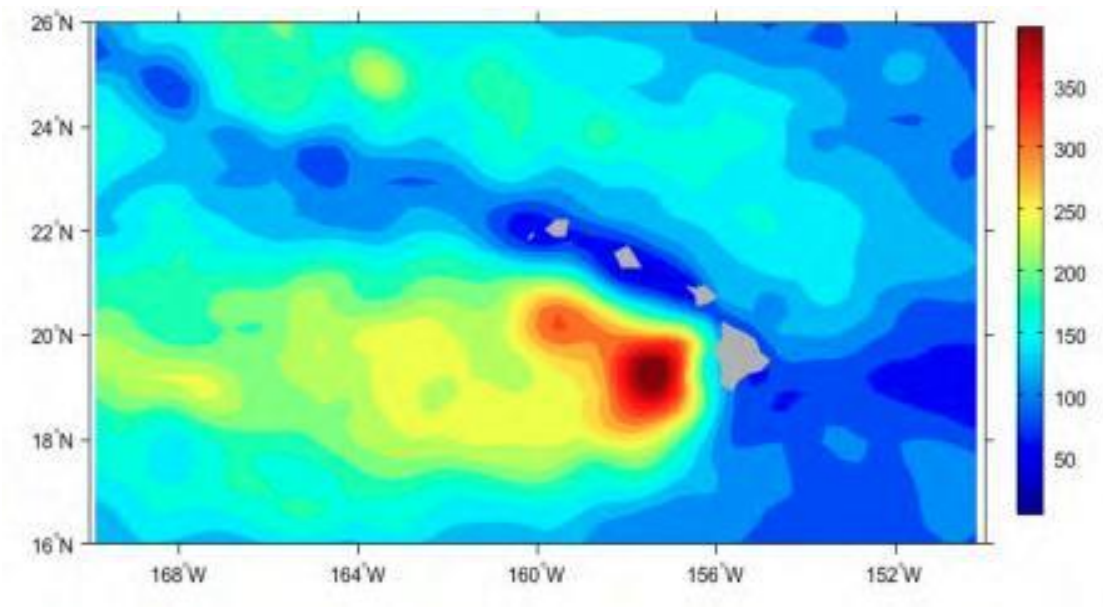

Figure 6. Mean eddy kinetic energy (cm/s)^2, from 1992-2005, calculated from AVISO merged satellite altimetry (Source: Calil, et al. 2008)2008)

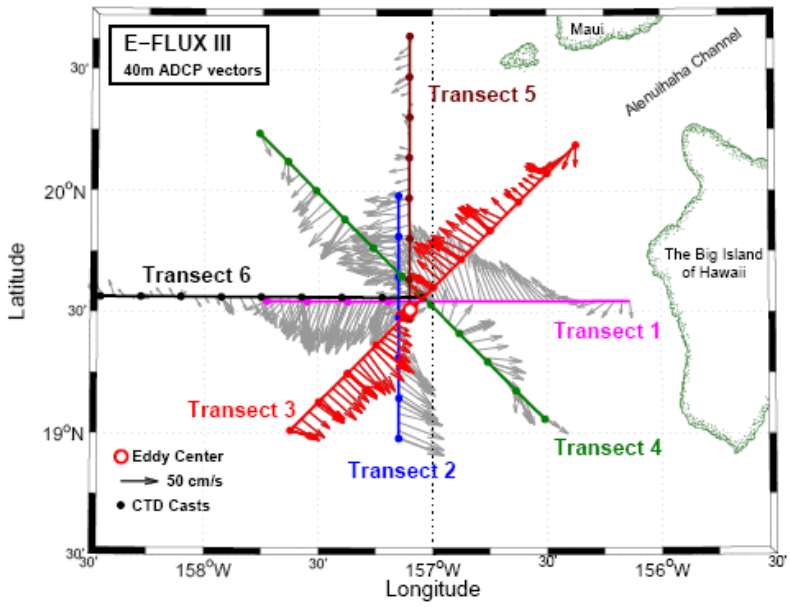

Figure 7. Acoustic Doppler current profile measured at 40 m depth during E-Flux III cruise, March 10-27, 2005. A strong cyclonic eddy was centered near the open circle in the center of the figure. (Source: Dickey, et al 2008)

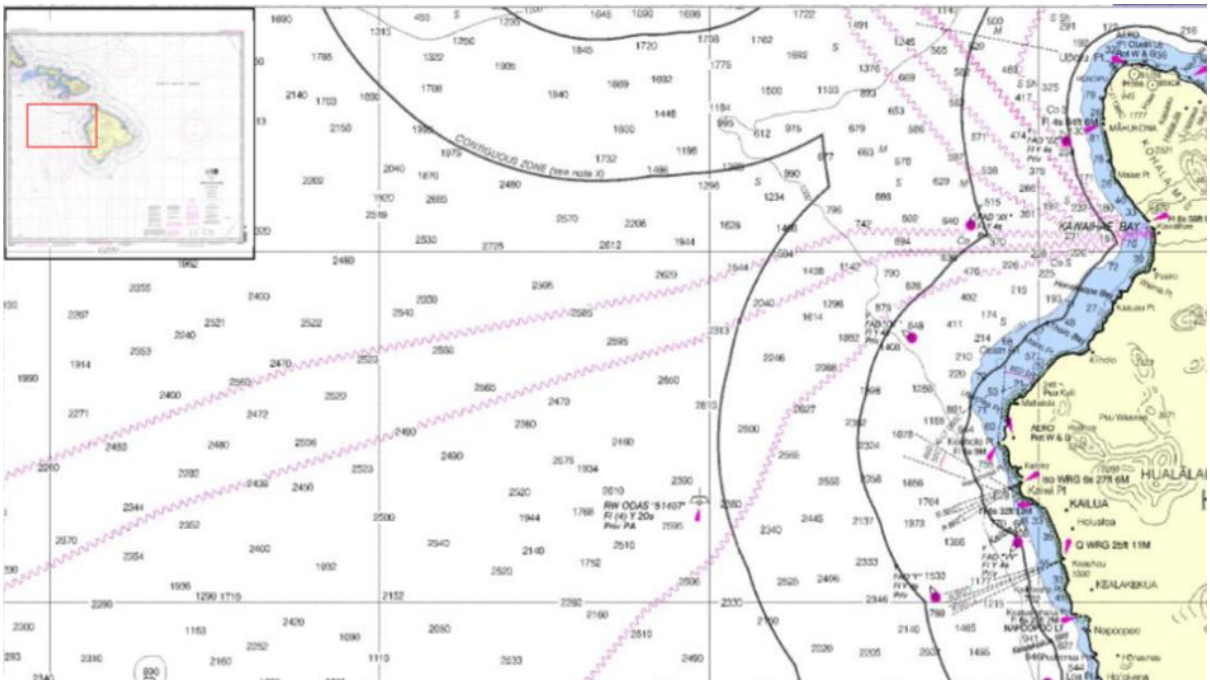

Figure 8: Ocean depths in fathoms on the leeward side of the Island of Hawaii, near Kawaihae Commercial Harbor (Source: NOAA Nautical Chart 19320)

3.3 Fauna and Flora

The Velella Concept test area is located in subtropical, deep ocean waters. The epipelagic portion of the deep ocean ecosystem, the surface to 200 m (656 ft), is home to a variety of primary and secondary producers (phytoplankton and zooplankton), forage species and pelagic fishes (WPFMC 2009b). State and Federal waters around the main Hawaiian Islands are the location of several of Hawaii's pelagic fisheries, including longline, troll and handline, offshore handline, and aku boat (pole and line) fisheries, which are the largest and most valuable in the state. The most important species in terms of value and volume in the Hawaiian pelagic fisheries are: bigeye and yellowfin tuna (*Thunnus obesus* and *T. albacares*), swordfish (*Xiphias gladius*), blue marlin (*Makaira mazara*), striped marlin (*Tetrapturus audax*), mahi mahi (*Coryphaena* spp.), wahoo (*Acanthocybium solandri*), and moonfish (*Lampris* spp.) (WPFMC 2009b). All of these species are highly migratory and probably all are present in various life stages in the test area. Bottomfish fishing, another important commercial and recreational fishery, primarily occurs in State waters and is not likely to be affected by the proposed permit activity since the majority of bottomfish fishing occurs in State waters and in ocean environments specific to seamounts and deep slopes around the Hawaiian Islands. Kona Blue understands that other fishermen access the same waters depicted in the action area and will work to minimize and/or help to mediate user conflicts if they were to arise. Furthermore, the cage is designed to reduce the chances of fish escaping, and the small number of fish being cultured is not expected to adversely impact wild populations of species commonly targeted by fishermen. Kona Blue uses native fish, reared from wild caught broodstock, in an effort to help minimize potential impacts.

3.3.1 Protected Species

There are a number of protected species that may occur in the project area, year round, or seasonally and these are described in this section. No critical habitat has been designated in the project action area;

however, there is proposed critical habitat for monk seals that may be transited by the tender vessel and supply vessels using the designated harbors (see section 4.9.2).

Several species of sea turtles occur in Hawaiian waters. Threatened green turtles (*Chelonia mydas*) and endangered hawksbill turtles (*Eretmochelys imbricata*) occur in nearshore waters throughout the archipelago. Endangered loggerhead (*Caretta caretta*), leatherback (*Dermochelys coriacea*), and olive ridley (*Lepidochelys olivacea*) turtles have been incidentally caught by Hawaii-based pelagic longline vessels (Gilman et al., 2006; WCPFMC 2009b).

Many seabirds are also known to inhabit or frequent the main Hawaiian Islands. Those of particular concern to pelagic fisheries are: the black-footed and Laysan albatrosses (*Phoebastria nigripes* and *P. immutabilis*); Christmas, Newell's, flesh-footed, wedge-tailed, and sooty shearwaters (*Puffinus nativitatis, P. newelli, P. carneipes, P. pacificus, and P. griseus*); masked, brown and red-footed boobies (*Sula dactylatra, S. leucogaster, S. sula*); and the Hawaiian petrel (*Pterodroma sandwichensis*). The Short-tailed albatross (*P. albatrus*) is considered a rare visitor to the main Hawaiian Islands and not likely to be observed in the action area. More detailed information on seabirds and interactions with Hawaii-based pelagic fisheries can be found in the Pelagic FEP (WPFMC 2009d).

Monk seals (*Monachus schauinslandi*) are found in the Northwest Hawaiian Islands, with many islands serving as reproductive sites. Monk seals also occur in waters around the main Hawaiian Islands (WPFMC 2009b).

Whales are common in waters around the Hawaiian Islands throughout the year, with some species more abundant on a seasonal basis. For example, the humpback whale population increases during the winter months (November to March) as they migrate to Hawaiian waters to breed. Cetaceans listed as endangered that have been observed around the main Hawaiian Islands include: the humpback whale (*Megaptera novaeangliae*); sperm whale (*Physeter macrocephalus*); blue whale (*Balaenoptera musculus*); fin whale (*B. physalus*); and sei whale (*B. borealis*). Humpback whales winter in Hawaii and tend to congregate in shallow waters, 600 ft. deep or less, about five months of the year. Their abundance (approximately 7,000 individuals) and ESA status caused the formation of the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS). Insular populations of false killer whales are known to exist in waters around Hawaii year around and sperm whales have also been documented to occur in Hawaiian waters (Baird 2009, Barlow, 2006). Populations of the Hawaiian insular false killer whales *(Pseudorca crasidens)* are currently proposed to be listed as endangered and may also occur in the action area. In total, iup to 18 different species of odontocetes and 5 species of baleen whales may utilize the waters around Hawaii (Baird 2011).

Of non-endangered cetaceans, two species, the bottlenose dolphin (*Tursiops truncatus*) and the spinner dolphin (*Stenella longirostris*) are known to be year-round residents of the waters around the Hawaiian Islands, including the proposed action area. Both species occur in oceanic and coastal environments off West Hawaii, can be expected to occur in the action area, and will likely be attracted to the proposed activity on occasion (Baird 2011, HOT, 2009).

Several marine mammal species that are protected under the Marine Mammal Protection Act (MMPA)- may be found in the oceanic waters off West Hawaii. These include: pygmy and dwarf sperm whales (*Kogia breviceps* and *K. sima*); killer whales (*Orcinus orca*); false killer whales (*Pseudorca crassidens*); pygmy killer whales (*Feresa attenuata*); pilot whales (*Globicephala macrorhynchus*); melon-headed whales (*Peponocephala electra*); rough-toothed dolphins (*Steno bredanensis*); and several species of spotted dolphins (e.g., *Stenella attenuata*). A more complete list is provided below.
The following marine mammals are classified as endangered under the Endangered Species Act (ESA) and have been observed in the Hawaiian Archipelago and may occur in action area:

- Humpback whale (*Megaptera novaeangliae*)
- Sperm whale (*Physeter macrocephalus*)
- Blue whale (*Balaenoptera musculus*)
- Sei whale (*B. borealis*)
- Fin whale (*B. physalus*)
- North Pacific Right whales *(Eubalaena japonica)*
- Hawaiian monk seal (*Monachus schauinslandi*)

Marine mammals that are protected under the MMPA, but not listed as threatened or endangered under the ESA, and that may occur in the action area, include the following:

- Blainsville beaked whale *(Mesoplodon densirostris*)
- Bottlenose dolphin (*Tursiops truncatus)*
- Bryde's whale (*Balaenoptera edeni*)
- Common Dolphin (*Delphinus delphis*)
- Cuvier's beaked whale (*Ziphius cavirostris*)
- Dwarf sperm whale (*Kogia simus*)
- False killer whale (*Pseudorca crassidens*)
- Fraser's Dolphin (*Lagenodelphis hosei*)
- Killer whale (*Orcinus orca*) [10]
- Longman's Beaked Whale (*Indopacetus pacificus*)
- Melon-headed whale (*Peponocephala electra*)
- Minke Whale (*Balaenoptera acutorostrata)*
- Northern elephant seal (*Mirounga angustirostris*)
- Pygmy killer whale (*Feresa attenuata*)
- Pygmy sperm whale (*Kogia breviceps*)
- Risso's dolphin *(Grampus griseus*)
- Rough-toothed dolphin (*Steno bredanensis*)
- Short-finned pilot whale (*Globicephala macrorhynchus*)
- Spinner dolphin (*Stenella longirostris*)
- Spotted dolphin (*S. attenuata*)
- Striped dolphin (*S. coeruleoalba*)
- Pacific white-sided dolphin (*Lagenorhynchus obliquidens*)

4 Potential Impacts of the Proposed Activity

4.1 Potential for Fish Escapes and Fish Health Issues

Concerns expressed with respect to open ocean aquaculture frequently focus on well known impacts associated with more studied, near shore and high density commercial fish farm operations (e.g., salmon farming). However, raising finfish in cages farther from shore, and away from coastal areas, has the potential to alleviate some of the recognized impacts of high density fish farming as well as provide more desirable conditions for production. For example, better flushing of the water surrounding the cages, site

[10] The Hawaiian insular false killer whale *(Pseudorca crasidens)* is currently proposed for listing as an endangered distinct population segment (75FR70169, November 17, 2010).

selection away from natural spawning grounds and deployment of more rigid nets and pens designed for raising fish in the open ocean offer the potential to minimize environmental effects. The proposed demonstration project was developed with these issues in mind while adding to the knowledgebase concerning offshore aquaculture in general.

Two main concerns of open ocean aquaculture involving the impact of escaped cultured fish into the wild are disease introduction and spread and reduction of genetic diversity. The use of the brass mesh cage and operational aspects of the project are designed to minimize fish escapes. In the proposed trial, the pen frame structure and brass wire cage material are sturdy and would be submerged away from surface wave action for the majority of the time. Moreover, the use of the CuPod would allow access through a hatch in the top of the cage that would be above water while the CuPod is raised to the surface in an effort to improve upon conventional designs and to reduce accidental escapes of cultured stock into the wild.

Should fish accidentally escape, genetic impacts to wild stocks are not anticipated for several reasons. First, the number of fish that would be cultured (2000) is small in relation to the wild population and will be maintained in an offshore environment significant distances from wild fish habitat. Second, the risk of significant numbers of the cultured fish escaping is expected to be minimal and the survival of escapees is not expected to be high due to natural predation. Third, the fish that are used in this trial are the first generation offspring of local wild fish, indistinguishable from wild stocks.

4.2 Diseases and Parasites

The risk of disease introduction and transmission is expected to be low for several reasons. The fish used to stock the CuPod would be inspected for disease prior to stocking. Additionally, it is established that high stocking density contributes to disease prevalence in aquaculture operations. The stocking density in the CuPod will be low and closely monitored by researchers and staff. Given the nature of the culture method, far offshore in ocean waters subject to constant flushing, issues related to skin flukes and bacterial infections seen at the inshore Kailua-Kona facility are expected to be avoided (KBWF 2009).for.

4.3 Impacts of Drugs and Chemicals

The proposed permit does not authorize the use of any antibiotic, medication, or chemical, unless otherwise authorized by a competent federal or state agency. If treatment is recommended and practical, authorized therapeutants would be administered only under standard treatment protocols and with relevant oversight under an approved INAD (Investigational New Animal Drug) permit from the Food and Drug Administration (KBWF, 2009) and/or under the guidance of the U.S. Fish and Wildlife Service's Aquatic Animal Health Program. [11,12]

4.4 Nutrient and Habitat Impacts

The proposed culture and harvest of the fish are not expected to have large and adverse impacts to water quality. The open mesh of the pen, small size of the operation, limited number of fish being stocked, careful feeding, and location offshore in eddies are all expected to minimize the buildup of nutrients that could result in changes to the ocean water chemistry, reduction of water quality, or changes in food webs.

[11] http://www.fda.gov\AV\GuidanceComplianceEnforcement\GuidanceforIndustry\ucm123818.htm
[12] http://www.fws.gov/aah/

4.4.1 Potential Impacts on Essential Fish Habitat, Habitat Areas of Particular Concern and Biodiversity

The MSA identifies EFH as those waters and substrates necessary to fish spawning, breeding, feeding and growth to maturity. HAPC is defined as areas where ecological function of the habitat is important, habitat is sensitive to anthropogenic degradation, development activities are, or would stress the habitat, or the habitat type is rare. Marine organisms managed in accordance with the MSA in approved fisheries management plans and that occur in the water column include highly migratory and pelagic fish species. Marine organisms managed in accordance with the MSA that reside on the ocean bottom include bottomfish and seamount groundfish, precious corals and coral reef ecosystems and crustaceans.
The CuPod would be operated in waters that have been defined as Essential Fish Habitat (EFH) and Habitats of Particular concern (HAPC) for pelagic management unit species (PMUS). The Council's recently published Fishery Ecosystem Plan for Pelagic Fisheries of the Western Pacific Region specifies 1,000 m (3,280 ft) as the lower bound of EFH for PMUS and 1,000 m in waters that lie above seamounts and banks within the EEZ shallower than 2,000 m (6560 ft) as HAPC. These broad designations are due to the recognized gaps in scientific information about the life histories and habitat utilization patterns of many PMUS (WPFMC 2009d).

EFH and HAPC boundaries, as designated by the Council, for all life stages of the bottom fish, seamount groundfish, and coral reef ecosystem MUS are also varied and extensive, going in most cases from the shoreline to 200 nm and depths from the surface to as much as 400 m (1,312 ft). These broad designations are also due to the gaps in scientific information about the life histories and habitat utilization patterns in those important fish species (WPFMC 2009c).

Concerns regarding potential project impacts to EFH include the possible reduction of quality of water column or benthic substrate within the project footprint from fish waste or food accumulation, ecosystem related impacts due to fish escapes or disease transmission, and disruption or displacement of habitat or migratory patterns from cage configuration.

The relatively small amounts of uneaten feed and the particulate and dissolved waste products of fish metabolism are not expected to accumulate in or near the array since the CuPod would be in constant motion that would facilitate rapid nutrient dilution and assimilation by the deep ocean environment, similar to what is observed at the KBWF inshore site (KBWF 2009). The chances for habitat disruption or displacement, or impacts on migratory patterns for any species of concern from the operation are minimal due to the transient nature and short duration of this test, small size of the pod, and the location of the activity outside of 3nm and away from seamounts.

Although the proposed action would occur within these general EFH and HAPC boundaries, it is of such limited scope and duration that the proposed action is not expected to cause any negative impacts to designated EFHs and HAPCs of any managed finfish species. Likewise, due to these same factors, it is anticipated that any impacts on the biodiversity of the Hawaii Archipelagic ecosystem would be negligible.

4.5 Effects on Target Species

The sustainability of the target species, *Seriola rivoliana*, is not expected to be affected by the proposed action. The culture, harvesting, and transport of the fish would be done in a manner that would minimize the risk of accidental release of the target species. If accidental escapes were to occur, it is believed that predation on the escaped fish from wild species (e.g., sharks) would be high, yet some may be able to survive longer or even become acclimated to the wild environment. While *Seriola rivoliana* is a species native to Hawaii, the location of the project would be located mostly away from reef habitat of this

species and post escape settlement is considered unlikely. Additionally, the CuPod and operating protocols are designed to prevent accidental escapes. If any of the cultured fish escape and survive, the impacts on wild stocks are expected to be negligible because of the small number of fish being cultured (2000 fingerlings) in relation to the wild population, a reduced likelihood of survival after escape, a low risk of being a disease carrier, and a low potential for reduction of genetic diversity in wild stocks that could occur if wild fish were to breed with escaped fish.

4.6 Effects on Non-target Species

No large adverse effects are expected to occur to non-target species stocks or stock complexes. Other non-target species may be attracted to the net pen which could act as a floating fish aggregation device or FAD. The effects of the pen as a fish aggregating devices are not expected to be large and adverse to the migratory habits of pelagic fishes because the pen is relatively small and will remain in a constant drift. Kona Blue will be observing aggregations attracted to the floating cage with cameras and divers.

4.7 Impacts of Feeds and Feeding on Wild Fish Stocks

As discussed above, the fish food that would be used in the Kona Blue project would consist of a specially formulated, pelletized ration that would be fed to fish until near satiation. KBWF experience indicates optimum consumption and minimal wastage occurs with this strategy. Given the level of the proposed activity, the calculated application of feed and the size of the CuPod (with a limited number of fish,) there should be little uneaten feed released to the environment.

Kona Blue's fish feed is especially formulated using lower than standard levels of fish meal (20%) and fish oil (10%) than usually found in carnivorous fish feed (usually around 40 to 50%). In this trial and at the KBWF Kailua-Kona facility, fish meal and oil have been reduced and replaced by agricultural meals and oils, reducing dependence on industrial fisheries. In addition to this agricultural products substitution, Skretting, Inc., the feeds supplier to this trial, also notes that all the fisheries products in its feeds are from sustainable sources (Skretting, 2010). Furthermore, establishing partnerships with established U.S. domestic agriculture entities (e.g., Illinois Soybean Association)[13] is considered to be a benefit to the U.S. agriculture industry, and encourages the use of more sustainable alternatives to aquaculture production in general.

4.8 Socioeconomic Impacts

The scale and duration of this ten-month test of the Velella Concept is limited and economic impacts of the project are expected to be small and of short duration. The tender vessel and crew would be chartered for the time necessary to stage and complete the demonstration. KBWF would lease space at Kawaihae Harbor as needed and utilize existing facilities at Honokohau Harbor to support the effort. Direct jobs generated could be few or none depending on how many KBWF existing staff are involved in the project, university graduate students would be hired to conduct monitoring and research during the duration of the project.

KBWF anticipates up to 8,000 pounds of fish would be harvested at the end of the test and records would be kept of the amount initially stocked, the number harvested and stock survival as prescribed under the special permit reporting requirements. If the test of the Velella Concept is successful, KBWF's intention is to market the grown out fish under the KBWF brand, Kona Kampachi®, through the company's established marketing and distribution channels. Some of the fish may be sold locally, while some may go to the U.S. mainland or abroad.

[13] http://www.ilsoy.org/index.cfm?pageID=36&criteria=aquaculture

The harvest of the fish from the test project would not compete with the market because this species is not currently harvested or marketed in Hawaii and the fish would be sold using the company's own existing markets. The small size of the production would not result in industry consolidation or overproduction. The production of this species in culture is not expected to result in an increased fishing pressure on wild fish stocks because wild stocks can have Ciguatera toxin and may contain large parasitic worms.

The operation would not be expected to negatively affect other fishermen and communities because of the small size of the array and its location beyond 3 nm and outside of the majority of popular fishing areas. The nature of the drifting array is expected to attract various pelagic fish species and other marine species while acting as a FAD. This has the potential to attract offshore fishermen and other vessels to the array. Fishermen would be expected to observe a safe distance from Kona Blue's operation, just as would be done for other fishing operations that exist in waters around Hawaii. Likewise, Kona Blue will attempt to stay clear of existing FADs to the degree possible while respecting other fishermen that utilize the same area of the ocean. Permitting the proposed activity would not grant Kona Blue special rights, or a lease, to exclusive use of any part of the ocean. The entire action area would remain open to all ocean activities to the degree it is accessible prior to the issuance of a permit.

4.9 Impacts on Protected Resources

4.9.1 Seabirds

The proposed action is not expected to cause harm to seabirds in the region. Attraction of protected species of seabirds (i.e., Short-tailed albatross, Newell's shearwater, and Hawaiian petrel) has not been an issue to date with either of the two existing nearshore aquaculture farms utilizing submerged cage technology according to proprietors with 15 years of operating experience, i.e., Hukilau Foods off of Ewa Beach, Oahu and Kona Blue Water Farms, Kailua-Kona, Island of Hawaii (HF 2009, KBWF 2009). Because the proposed action consists of a slowly moving CuPod that spends the vast majority of time submerged at 25 ft below the sea surface, there is little or no opportunity attract oceanic seabirds or pose an entanglement risk. Moreover, the cage is made of small-sized (largest diameter of 50 mm or 2 in), rigid, brass mesh material rendering the interior of the pen inaccessible to seabirds (Figure 5). Pursuant to 50 CFR §665.224, PIRO sent information pertaining to the application of this project to the U.S. Fish and Wildlife Service (USFWS) which has jurisdiction over listed seabirds. No comments were provided by the USFWS.

4.9.2 Potential Impacts to Sea Turtles and Marine Mammals

Monk seals occur in the Hawaiian Archipelago, and while historically associated with the Northwestern Hawaiian Islands, the population of monk seals around the main Hawaiian Islands has been increasing in recent years, making it possible that a monk seal could visit the Velella array. However, monk seals generally inhabit shallower coastal waters for protection and are not anticipated to be abundant in the action area given the distance from the land and the depth of the proposed activity (NOAA 2010). Sea turtles are also known to frequent the region year around. Potential interactions with any endangered species are expected to be minimal given the lack of entanglement risk due to the rigidity of the CuPod and the limited amount of line that is being used in the proposed activity. Hence, the most serious effect from the proposed activity on endangered species is anticipated to be more behavioral (e.g., the result of a marine mammal investigating the CuPod or predation), as opposed to the CuPod and tender vessel or other operations causing injury or mortality (e.g., entanglement).

Experience, to date, with fixed-point, nearshore aquaculture in Hawaii is that active net-pen operations do not generally attract large whale species, but turtles and dolphins will occasionally approach the pens for short periods of time (HF 2009; KBWF 2009). The proposed action is designed to minimize such behavioral conditioning affiliated with a fixed-point FAD-like operation in that the constant motion of the velella array is expected to dissuade and/or minimize the likelihood of routinely attracting the same animal on a regular basis. Any observations of marine mammal interactions with the CuPod would be reported to NMFS. Under the terms of the permit, NMFS may require that an observer be posted on the tender vessel at any time.

There is the potential that fishermen may use the CuPod as a FAD, which might attract and increase the potential for fishing interactions with dolphins and other marine mammals. This risk is considered low primarily because Kona Blue is not proposing to broadcast their location through public media sites, and the CuPod will remain in motion the great majority of the time.

Because of the small scale of the project, staff monitoring, reporting requirements, the project is not expected to result in large adverse effects on protected species that are attracted to the array.

4.9.2.1 Entanglement

A concern with protected species, particularly marine mammals, is entanglement in nets and lines used in ocean activities. The float and weight lines to be used in the project would be made of 8-strand plaited nylon rope, equal to or greater than 1 inch in diameter. Additionally, observations of the gear and any protected species nearby would be made prior to the controlled raising or lowering of the CuPod (e.g., when cleaning, stocking or harvesting). For comparison, the floatlines and towing rig used in the demonstration project would be similar to other fishing or towing operations (e.g., tug boats) where gear or tow lines are maintained at or below the surface behind a vessel. Aquaculture facilities located State waters, particularly Hukilau farms (HF) and KBWF, have had no reported incidents of protected species entanglements in a combined 15 years of operation (HF 2009, KBWF 2009). In addition, all staff and crew aboard the tender vessel are expected to adhere to the same marine mammal management and reporting plan as used at KBWF's Kailua-Kona site and report any contacts to, and immediately discuss any problems with, appropriate Federal officials.

4.9.2.2 Vessel Strikes

Vessel strikes on marine mammals or sea turtles are not expected to occur. The maximum speed of the velella array at any time is estimated to be about 2 knots (kt). By comparison, NOAA's general guidance for vessels transiting areas where there are known populations of whales shows that collisions are minimized when traveling less than 10 kt (HIHWNMS, 2011b). To help avoid collisions with protected species, crew members on board the tender vessel used for the operation are expected to actively monitor the area around the vessel and the towed CuPod. The small size of the pod and slow speed of operation is expected to minimize the risk of marine mammal interactions while the vessel is under sail, power or adrift. Support vessels that frequent the velella array during the duration of the operation (e.g., weekly or monthly) are expected to also be vigilant against the possibility of endangered species strikes and the permittee would be responsible for recording and reporting interactions if they were to occur. Speeds of the support vessels are expected to be on the scale of what an average recreational vessel operating in Hawaii is and, while there are no speed restrictions from a regulatory standpoint, reducing speed when marine mammals or turtles are present reduces the strike risk considerably. One model that was developed to assess the effect of vessel speed on whale strikes resulted in the finding that a conventional ship moving at 20 to 25 kt can reduce the possibility of a ship striking a whale by 30 percent simply by slowing down to 12 or 13 kt, and by 40 percent by slowing to 10 kt (Kite-Powell, et al. 2007). At 2 kt, the risk of collisions with marine mammals is almost negligible. If a collision were to occur, a report would be filed with NOAA NMFS as a condition of the permit requirements (see Appendices C).

4.9.2.3 Noise

Noise from the drifting, sailing or powered tender boat is expected to be minimal, as would be the occasional sound of feed being pumped to the fish in the CuPod and the raising and lowering of the pen using ballast tanks. The main power of the tender boat, when not using sail, is a diesel engine rated at 190 horsepower. Noise emitted from the support and supply vessels is not expected to be any different than any other vessel allowed to operate in waters around Hawaii. Furthermore, when raising the cage, air entering and leaving the CuPod's ballast tanks is expected to emit a soft hissing sound that could be heard underwater, similar to typical hydraulic systems used in other commercial or recreational operations that regularly set or retrieve gear. When fish are transferred to and from the CuPod they will likely be scooped with nets the majority of time. However, if a pump were to be used, the sound as heard underwater is expected to be on the scale of a ballast pump, and would only be used a few times during the entire operation. Overall, impacts of noise from the proposed activity on protected species are expected to be negligible, and noise levels are expected to be much quieter than those associated with active commercial and recreational fishing operations where it is common practice to operate hydraulic lifts and line reels.

4.9.2.4 Effluents and waste

The impacts of effluents associated with aquaculture projects on protected resources are another potential concern. Fish would be fed in a manner that minimizes the delivery of access feed to the stock, hence, there should be little uneaten feed released to the environment which would serve as an attractant. The small number of fish, minimal amount of wastes or food released from the pod, and anticipated rapid dilution and assimilation of particulates including uneaten feeds or fish metabolites are anticipated to be of low concentration and not expected to be measurable or impact protected species.

Exposure to general vessel wastes can be harmful to marine mammals and sea turtles as well. Plastic trash and bags may be ingested, cause suffocation, or, along with discarded ropes and lines, may entangle animals. Shipboard wastes and discharges may contain toxic chemicals. The effects of toxic chemicals exposure could, depending on the chemicals and their concentration, result in avoidance or abandonment of an area or death. Local and Federal regulations prohibit the intentional discharge of toxic wastes and plastics into the marine environment and violators may be subject to civil penalties. Violation of such established regulations may also be grounds for permit revocation. Finally, as regulations and permit conditions require, Kona Blue would keep records on any interactions with protected species resulting from effluents and wastes and would report such activity should it occur.

NMFS evaluated the potential secondary impact of the CuPods on false killer whales or other marine mammals which could be attracted to the array because of the fish aggregating below it. NMFS does not expect predation of false killer whales or other marine mammals to be a common occurrence at the Velella array in part because the pod is quite small, sharks would have other prey to hunt, and marine mammals are mobile and are likely to escape predation. The FAD effect of the array would be minimized through operational procedures that will not allow disposal of dead fish in the ocean and minimize the amount of food that enters the environment beyond the cages. Compared to the baseline environment where sharks and marine mammals interact at FADs, the CuPod array is not expected to be a large change that would result in harm to marine mammals. Divers and staff would be able to record any adverse interactions and report such interactions to NMFS.

4.9.2.5 Critical Habitat

Currently there is no designated critical habitat within the action area. The effect of the proposed action on the nearshore waters was examined. The small number of vessel trips to stock and harvest the fish, and the low number of vessel trips required to restock feed by the tender vessel, are well within normal maritime traffic levels and activity would not degrade the quality of habitat being considered for potential future monk seal critical habitat (see section 7.7.1).

4.9.3 Potential Impacts of Sharks on Human Safety

Nearshore aquaculture has caused public concerns over attraction of sharks to the vicinity of the CuPod and closer to coastal areas. In nearshore net pen situations in Hawaii (i.e., the two existing operations, Hukilau Foods (HF) and KBWF) sharks have been observed on occasion, but generally with no particular pattern of attraction or avoidance to the pens (HF 2009). Under the proposed action, standard management practice by Kona Blue is to remove any dead fish from the pens on a regular and timely basis, which is expected to reduce that potential attractant. There has been one incident, reported by KBWF, where a diver was threatened by a tiger shark, which had to be killed due to diver safety concerns (KBWF 2009). The addition of monitoring cameras to Kona Blues operation are intended to significantly reduce, if not eliminate, such unintended encounters for divers that enter the water around the CuPod.

4.9.3.1 Potential Impact of Sharks on Human Safety

While sharks can be expected to be attracted to the CuPod, the proposed activity is not expected to attract sharks to inshore coastal environments. Since no fish would be in the CuPod when departing or returning to port, there is no reason to believe that sharks would remain with the velella array any more so than other boat traffic in the vicinity. Because the grow out operation would take place in deep ocean waters, 3 to 150 nm offshore, away from nearshore and coastal recreational areas, there is no reason to believe that sharks will be attracted in greater numbers to coastal and beach areas as a result of the proposed activity.

4.9.3.2 Potential Impacts of the Array on Sharks

There are nine species of oceanic sharks that are found in the open ocean environment and all are rarely encountered by transiting vessels and generally do not frequent coastal waters with regularity (WPFMC 2009b). Regardless, any dead fish would be removed from the pen regularly and a shark management plan that focuses on diver safety and non-lethal shark control (e.g., throwing dead fish overboard can be a shark attractant), similar to the one established for previous operations in state waters, would be followed for the duration of the trial (KBWF 2009). Non-lethal shark control calls for the removal of dead fish from the array and freezing them. This, together with the constant movement of the array are expected to limit encounters with sharks and are also expected to minimize potential adverse effects of the permit activity on sharks such as changing their natural activity and behavior patterns.

4.10 Potential Impacts on Air Quality, Viewscape, and Energy Resources

The proposed action would involve a single tender vessel that would utilize sail and diesel power rated at 190 horsepower to tow a small CuPod stocked with 2,000 fish in Federal waters between 3 and 150 nm off the leeward shoreline of the Island of Hawaii. The intention of the permittee is to maintain the array's position in a westward moving eddy and occasionally adjust the array's position within the eddy and/or move the pod closer to the east side of the action area by using sail power or diesel power. During virtually the entire ten-month test, the CuPod would be towed submerged 25 ft below the surface with marker buoys and the tender vessel would be visible and have appropriate Coast Guard markings and lighting for navigational safety. The array would also avoid moving over the deep ocean seamounts and

banks in the region utilized by fishers in order to minimize user congestion and avoid attracting fishermen to the array.

Given that the location of the tender vessel and CuPod would be far from the coast and operating in a large expanse of ocean generally in areas with water depths of 10,000 to 12,000 ft; and given the fact that the array would generally be maintained using wind power and intermittent diesel power, no adverse impacts on air quality or viewscapes are expected. There is also not expected to be a requirement for energy resources. Therefore, these issues will not be considered further.

4.11 Potential Impacts on Water and Seafloor Quality

The proposed action would take place on surface waters in areas with depths of 10,000 to 12,000 feet. Local experience with commercial offshore net pen culture in State waters to date indicate that water and sea floor quality effects from this type of activity are anticipated to be negligible.

This test proposes to grow out approximately 2,000 fish over a ten month period to an average weight of four pounds. A specially formulated, compounded feed in pelletized form would be utilized and carefully distributed so as not to overfeed. Feeding would be observed by cameras and divers. The Feed Conversion Ratio (FCR), the ratio of how many pounds of feed to produce on pound of fish, is expected to be around 2:1, judging from Kona Blue's experience with its State lease (KBWF 2009). Therefore, approximately 20,000 pounds of feed can be expected to be used during this ten month trial, based on a projected 80% survival rate for the stock and it is anticipated to be about 4,000 pounds of feces over that time period based on a fish feed assimilation efficiency of around 90% (i.e., 90% of the feed would be metabolized by the fish) (Sims, 2010).

Water and substrate quality concerns with net pen aquaculture in general focus on the resulting particulates (uneaten food and feces) and the dissolved metabolites (largely ammonia which converts to ammonium at the pH of sea water). For the current project, no reduction in water quality is expected to occur. Neither particulates nor dissolved metabolites are expected to accumulate due to the near constant flushing of the pen and the low stocking density. Other project characteristics that are expected to reduce the likelihood of particulates include: low stocking density and flushing that would likely prevent diseases or pathogens from affecting the stock; the careful application of feed; and the nutrient-poor (oligotrophic) nature of the deep ocean and its inherent assimilation capacity for nitrogen byproducts of metabolism. Furthermore, the constant movement of the pen through the open ocean would ultimately result in very large volumes of water passing through the pen to "instantly" mix and dilute fish metabolites and particulates is expected to create a self-cleaning environment for the mobile CuPod (HF 2009; KBWF 2009). The open ocean flushing, water currents, and extreme water depth are features of the environment that would help dilute any wastes and prevent adverse impacts to the oceanic environment.

4.12 Potential Impacts on Major Ocean Uses and Environmental Justice Issues

The tender and submerged net pen array would be in a constant controlled drift – pushed along either by eddy currents, sail power, or diesel power – in ocean waters between 3 and 150 nm from the leeward coast of the Island of Hawaii for approximately 10 months. The array would be required to be operated in accordance with U.S. Coast Guard safety and navigation requirements. The tender vessel is equipped with modern telecommunications equipment and radar suitable for long distance trips over the open ocean and for communicating with other boat traffic. Encounters with other sea going commercial, military, and recreational vessels will be subject to Coast Guard rules established under the International Regulations for Preventing Collisions at Sea, 1972 (72 COLREGS) (Miller 2010).

The towing situation would be signaled by standard lights and flags and displaying dive flags when divers are in the water. Kona Blue does not intend to publicize or promote this potential fishing opportunity to local fishers due to concerns over staff safety, i.e., divers would be in the water. Doing so could also be counter-productive to the purpose of the test if large numbers of boats fish around the array.

If issues were to arise with boats coming too close to the array, crew members would communicate via radio or otherwise the nature of the tow situation to approaching vessel operator(s) and seek cooperation. Kona Blue recognizes that commercial and recreational fishers occasionally may want to troll near the array due to the likelihood it could attract pelagic species of game fish. The fishing permit does not grant any exclusive geographic ocean access to Kona Blue.

Environmental justice promotes fair treatment of all people to ensure that the environmental impacts of proposed government programs, policies, and activities do not have disproportionately large or adverse effects on members of minority ethnic groups or low income groups. In the case of this action, the granting a permit for a limited scope and duration trial of a new method of harvesting fish from the U.S. EEZ would not result in a large adverse environmental impact that could affect members of Environmental Justice populations. Also, the project would not have a large or adverse impact on any member of the West Hawaii community. This conclusion is supported by the following: 1) the activity would occur 3 to 150 nm from shore; 2) the project does not inhibit access to or use of the ocean by others; 3) the use of harbor facilities and roads is not expected to result in large impacts to others; and the proposed activity is of a limited duration.

4.13 Potential Impacts on Historical, Archaeological or Cultural Resources

The proposed action has no potential effect on cultural resources or historic properties. The activity would be carried out in Federal waters between 3 and 150 nm off the leeward coast of the Island of Hawaii in water with depths ranging between 10,000 ft and 12,000 ft. There are no historical or archeological resources known in these deep ocean waters of the action area. Support facilities for the project are located at well-developed, well-used State harbors at Kawaihae and Honokohau, Island of Hawaii. Appendix E provides a map of Kaloko-Honokohau National Historic Park and the location of the Puʻukohola Heiau National Historic Site, both operated by the U.S. National Park Service. Kaloko-Honokohau National Historical Park is adjacent to the harbor entrance and contains several sites of cultural significance, including native fishponds (e.g., Kaloko Fishpond)[14], kahua (house site platforms), ki'i pohaku (petroglyphs), holua (stone slide), and heiau (religious site).[15] Puʻukohola Heiau National Historic Site, just south of Kawaihae Harbor, also includes important cultural resources of Hawaii, including submerged ruins of an ancient temple.[16] However, the proposed activity has no potential to affect these sites. Stocking and harvesting will involve a small number of trips by support tenders out of and back into the harbor as fish are transported to and from the CuPod. Vessel traffic will not materially increase over current levels. Activities associated with the proposed activity have no potential to effect historical, archaeological or cultural resources (see also, section 7.11)

4.14 Potential Impacts Related to Global Climate Change

This trial would take place in an open ocean environment that is dynamic and subject to the long-term impacts of global climate change. The global mean temperature has increased by 0.76° C over the last 150 years, and the linear trend of temperature over the last 50 years is nearly twice that for the last 100 years (IPCC 2007a). Ample evidence now exists supporting the wide-ranging ecological impacts

[14] http://www.nps.gov/kaho/index.htm
[15] http://nationalparks.org/discover-parks/index.cfm?fa=viewPark&pid=KAHO
[16] http://www.nps.gov/puhe/index.htm

of global climate change (Walther et al. 2002). Observed changes in marine systems are associated with rising water temperatures, changes in ice cover, salinity, oxygen levels, circulation, and ocean acidity. Changes to marine systems include shifts in ranges; changes in algal, plankton, and fish abundance (IPCC 2007b); and damage to coral reefs (Scavia et al. 2002), and other impacts. A more complete summary of climate change and climate change impacts can be found online at http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#1.

In general, large scale climate cycles can impact winds, currents, ocean mixing, temperature regimes, nutrient recharge, and affect the productivity of all trophic levels in the North Pacific Ocean (Polovina et al. 1994). These impacts are expressed as variability in stock size, recruitment, growth rates, or other factors. Pelagic fishes, as well as protected species that interact with the fisheries, are currently affected by these large-scale climate fluctuations and would continue to be affected in the same way under each of the alternatives. Climate change may impact the availability of tunas and this may in turn impact all pelagic fisheries; however, how and to what extent is not known. Climate change would not adversely affect the applicant's ability to test the feasibility of using the towed CuPod to culture *Seriola rivoliana*. Future impacts of climate change have been considered in view of the potential cumulative impacts on fishery target and non-target species and protected resources. No impacts to the CuPod and tender vessel array are expected to result from large scale global climate change. The use of a tender vessel, and support vessels, is not expected to result in any substantial increase in greenhouse gas emissions.

4.15 Impact of a Disabled Ship and/or an Abandoned or Breakaway CuPod

Operational protocols and gear selection have been developed to address mechanical mishaps. In the event of mechanical, weather, or equipment related issues, projected environmental effects are anticipated to be minor. The design and deployment practices for the gear incorporate mitigation and recovery methods and redundancy. Should the tender/towing vessel become disabled or the CuPod become broken or break away from the array, operational protocols are in place to minimize or avoid anticipated potential impacts on the human and ocean environments. Basically, Kona Blue would rely on the experienced judgment of the crew of the *S/V Machias* to address the issue, and follow procedures described in the Velella Project Emergency Reporting Plan (Appendix D). The failure risks considered in the design of the trial and risk mitigation measures are briefly described below.

The *SV Machias* is a Coast Guard inspected and documented vessel outfitted and approved for open ocean, blue water cruising that includes space for 24 passengers. Currently, the vessel is approved for service between Hawaii and Kiribati and is equipped with modern communications and navigation technology, e.g., two-way radio, GPS, radar, high frequency transceivers, etc. It can use both sail power and diesel power and in the event of problems can communicate with the Coast Guard for assistance. In storm conditions, the tender vessel would lay an additional 600 ft of line out from the pen and use the pen as a sea anchor to control vessel orientation and limit drift (Figure 1).

In the event of a break in CuPod structure, attempts would be made to repair the problem at sea. Assistance and materials to repair a problem can be brought by boat from the project base at Honokohau Harbor. The pen can be raised to the surface by using an air compressor on the tender vessel that is connected to ballast tanks in the pen via an air hose. The CuPod is marked with a light and a buoy float and has the residual buoyancy to remain at the surface indefinitely. If separation from the vessel occurs, an assessment of the situation would be made and a decision as to whether or not to continue the trial would be made in consultation with NMFS. Impacts of stock escape are discussed elsewhere in this report. Support for the overall operation and transport boats would be available at any time or day from the Honokohau Harbor support base.

Detachment of the CuPod from the tender vessel would require larger scale remedial or corrective actions. In order to minimize risks and avoid mechanical failures, the CuPod towing bridle would be inspected frequently and the pen would be under regular observation by vessel crew, staff, and cameras on each pen. Should the pen become detached, the lighted surface buoys have enough residual buoyancy to keep the entire array afloat indefinitely. Also, the CuPod is equipped with GSP transmitter and radar reflector for tracking purposes and to facilitate location.

In the event of a hurricane or other natural event that would require the separation of the tender from the CuPod for safety purposes, the submerged cage would remain adrift and tracked until recovery. In the unlikely event that the CuPod must be scuttled, the CuPod without the float buoys is negatively buoyant and would be expected to sink, as not to cause further navigational hazards. No oil, oily waste, or chemicals are carried onboard the CuPod that might degrade the environment. If stocked with fish at the time, the entire stock would not be expected to survive at the anticipated depths.

4.16 Cumulative Impacts

The proposed action is a small scale project that will have minimal impacts that are of short-duration, and accordingly will not likely contribute significantly to cumulative impacts. The proposed action is the only one of its kind within the geographic area, and is expected to have less environmental impacts than existing and long-term, fixed point mariculture projects already occurring in State waters. The proposed project would not result in incremental impacts that could become significant when considered with existing projects in federal waters because no other aquaculture projects are currently operating in federal waters around Hawaii. The proposed permit would not result in extraction of biological resources from the environment and inputs, in terms of particulates and metabolites, are expected to be insignificant and quickly diluted.

NOAA encourages the research, development, and demonstration of emerging technologies, including offshore and open ocean aquaculture, to increase domestic supplies of seafood and has issued a Final Aquaculture Policy to guide development (NOAA 2011cc). Issuance of a permit for the conduct of the proposed gear test to culture and harvest a MUS does not, however, obligate NMFS, PIRO, WPFMC, or any other Federal agency to approve another trial of the Velella Concept at any scale in the proposed region or any other site in Hawaii. If another gear trial is proposed in the future, an application for a permit would begin a new approval process with appropriate environmental review based on results from the proposed test deployment and in compliance with associated legal requirements at the time. Any large scale commercial operations applying to operate in the EEZ around Hawaii would have to undergo an environmental impact analysis and be consistent with the NOAA aquaculture policy.

4.17 Effects on Administration and Enforcement

Failure of the permittee to comply with the terms and conditions of the permit may result in sanctions and possible revocation of the permit. The proposed trial is small in scale and not expected to require additional law enforcement or administrative burden. Also, the proposed trial would be of limited duration and the processing of submitted logbooks would have no substantial effect on administration.

5 Administration, Compliance, and Enforcement

5.1 Permit Process

Issuance of a SCREFP is required under the existing Hawaii FEP if a vessel is used to harvest a Hawaii Coral Reef Ecosystem MUS in a coral reef ecosystem management area with gear not specifically listed in the plan or the governing regulations (50 CRF 665.224)(WPFMC, 2009c). *Seriola rivoliana* is a Hawaii Coral Reef Ecosystem MUS classified by the Hawaii FEP as a Potentially Harvested Coral Reef Taxa (PHCRT) and the proposed use of a floating cage is not listed as a gear-type in the regulations (WPFMC, 2009c).

Based on the small scale and remote location of the proposed test activities, and based on results of previous research done by the applicant, additional permits are not required to conduct this gear test in the U.S. EEZ. Under Section 10 of the Rivers and Harbors Act of 1899, as extended by the Outer Continental Shelf Lands Act (OCSLA), the Army Corps of Engineers requires a permit for the placement of any obstruction to navigation in federal waters (33 U.S.C. § 403). In the US EEZ, an ACOE permit is required for "installations and other devices permanently or temporarily attached to the seabed …" (43 U.S.C. § 1333). Because the CuPod will not be tethered to the seabed, a permit for the proposed action is not required. Aquaculture facilities producing less than 100,000 pounds of product annually are not required to obtain a National Pollutant Discharge Elimination System (NPDES) permit (40 CFR 122.24c). U.S. Coast Guard documentation of the vessel is, however, required and has been obtained (46 CFR 67). A review of the permits for aquaculture in the U.S. EEZ can be found in Cicin-Sain, *et al*. (2005).

Briefly, the process to receive a limited scope and duration SCREFP from NMFS, PIRO, Sustainable Fisheries Division, involves submission and acceptance of a complete application form by the PIRO Regional Administrator (RA). Next, comments on the application are sought from the Council, as well as the U.S. Coast Guard, the State of Hawaii's Department of Land and Natural Resources, and the U.S. Fish and Wildlife Service. Input from these agencies is considered by the RA in the decision for approval or disapproval of the application. Upon receipt of this information, the RA considers the Council's comments and may concur or reject its recommendations, as presented by the Executive Director. The applicant is subsequently informed of the decision to proceed, or in the event of a negative decision, has the opportunity to appeal (50 CFR 665.224, Subpart C Hawaii Fisheries) (Appendix B).

In addition to independently collecting information on the technical and economic feasibility of this approach, KBWF would maintain and submit records including two NOAA Fisheries Service, PIRO, official forms that would be adapted for this test. The two forms are: 1) the Special Permit/Low-use Marine Protected Areas Coral Reef Taxa Daily Catch Report; and, 2) the NMFS Transshipment Log for Coral Reef Ecosystem Management Unit Species (Appendix C). In accordance with the MMPA 16 USC 1387(e) and 50 CFR 229.6, any vessel owner or operator, or gear owner or operator participating in a fishery listed on the List of Fisheries must report to NMFS all incidental injuries and mortalities of marine mammals that occur during commercial fishing operations, regardless of the category in which the fishery is placed (I, II or III).

5.1.1 Permit Conditions

Pursuant to federal regulations found in 50 CFR §665.224, the Regional Administrator may attach conditions to the special permit as may be necessary to ensure compliance with the purposes of the special permit consistent with the management objectives of the Hawaii FEP. Failure of the holder of a special permit to comply with the terms and conditions of a special permit is grounds for revocation, suspension or modification of a special permit. Any action taken by the Regional Administrator to revoke, suspend, or modify a special permit will be governed by 15 CFR §904 subpart D and 50 CFR §665.224.

The permit holder shall conduct operations in accordance to the terms and conditions of the special permit, detailed below. NMFS reserves the right to impose additional conditions under this permit as determined reasonable or necessary to ensure safety of personnel and the environment.

The following terms and conditions would be applied to this Special Coral Reef Ecosystem Fishing Permit:

1. The special permit holder shall comply with all applicable federal, state and county laws, rules and regulations;

2. The special permit holder shall comply with all applicable federal fishing regulations found in 50 CFR part 665 subpart A and subpart C, including but not limited to permit and reporting requirements and landing notification requirements;

3. The special permit authorizes the use of the 132 m^3 (4,662 ft^3) CuPod as analyzed in the EA;

4. The Almaco jack (*Seriola rivoliana*) is the only species approved for stocking of and harvest from the CuPod. No other species is approved;

5. The CuPod shall hold no more than 2,000 individual fish at any given time;

6. Prior to stocking with fish, the CuPod must be equipped with a radio transmitter/radar reflector buoy(s), and/or an approved gear tracking system (e.g., satellite tracking, GPS);

7. The activities authorized under the special permit are confined to within federal waters bounded by the following coordinates (see Figure 2):

Point	N. lat.	W. long.
A	20° 00’	158 ° 00’
B	20° 00’	156 ° 00’
C	19° 00’	156 ° 00’
D	19° 00’	158 ° 00’

8. With the exception of vessel and gear provisioning and powered transit to and from federal waters, the activities authorized under the special permit may not be conducted within marine waters of the State of Hawaii (0-3 nautical miles), or within the boundaries of the Hawaiian Islands Humpback Whale National Marine Sanctuary, as defined in 15 CFR §922.181;

9. The use of prophylactic antibiotics, medications, chemicals, or other treatments shall not be allowed unless authorized by a competent federal or state agency, or dually licensed veterinary personnel;

10. The special permit holder shall monitor the condition of the CuPod on a continual basis, including fish within the CuPod. When weather and ocean conditions do not permit physical monitoring, visual or remote monitoring shall be conducted;

11. Dead fish shall not be disposed of in the surrounding waters, but shall be removed from the site and disposed at a County approved site;

12. The special permit holder will comply with the Velella Project Emergency Reporting Plan and the Marine Protected Species Monitoring and Reporting Plan as described in Appendix C for the duration of the of the permit;

13. NMFS PIR reserves the right to inspect and/or provide an observer to the demonstration project to monitor the operation as necessary;

14. The special permit is non-transferable;

15. In issuing the permit, NMFS PIR and the Regional Administrator have relied on the information and data which the applicant has provided in connection with the permit application. If, subsequent to the issuance of the permit such information and data have proved to be false, incomplete or inaccurate, this permit may be revoked, suspended or modified; and

16. Failure to comply with the terms and conditions of the special permit is grounds for revocation, suspension or modification of the special permit.

Notification
The special permit holder must contact the appropriate NMFS official in Hawaii at least 24 hours before landing any CRE MUS harvested under a special permit, and report the port and the approximate date and time at which the catch will be landed.

The permit applicant, KBWF, would be responsible for complying with all applicable maritime and other civil laws in the conduct of its test operations under the permit. As with all permits NOAA issues, compliance would be subject to enforcement by NOAA law enforcement officers. The Coast Guard is also authorized to enforce MSA regulations.

6 Consultations, Coordination and Recommendations

6.1 Consultations and Recommendations

Coordination with the Council
The proposed activity by Kona Blue was discussed at two Council meetings (150th and 151st) and the 2011 Hawaii Archipelago Plan Team meeting. In addition, and pursuant to the Coral Reef FEP Special Permit regulations, 50 CFR §665.224, the application for the proposed activity was sent to the Council for consideration in February 2011. The Council and interested parties who had identified themselves to the Council provided recommendations as highlighted below. In a letter signed by the Executive Director to PIRO dated February 25, 2011, the Council indicated that it did not object to the project, but requested the applicant and/or PIRO address certain concerns. In addition, the Council forwarded a letter to PIRO that contained additional concerns from small boat fishermen. PIRO's collective response to these concerns is as follows:

I. The Council suggests that NMFS delineate the boundaries of this project to a known set of coordinates off of Kona, Hawaii, that forms a box with straight lines for ease of enforcement.

Response: The boundaries of the action area are delineated and described in the current EA (Section 1.3.1).

II. *To reduce conflicts with navigation, the Council suggests NMFS require that the applicant provide the coordinates of the project (to be delineated by NMFS) to the U.S. Coast Guard for inclusion on their "notice to mariners" and properly mark the gear as the USCG advises.*

Response: The Fourteenth Coast Guard District was consulted and details for notification and navigation requirements are included in Section 4.12 of the EA. Kona Blue will be expected to comply with USCG regulations as well as the permit conditions required under the SCREFP.

III. *The Council suggests NMFS provide a recommendation to the applicant to consider using the Automatic Information System (AIS) technology to identify itself to the maritime shipping industry.*

Response: Use of the Automatic Identification System (AIS) is not required under existing Coast Guard regulations (33 C.F.R. 164) and is not part of the demonstration project proposed. Kona Blue will have the capability to notify USCG and/or PIRO of current positions and potential navigational hazards as required.

IV. *The Council suggests NMFS recommend the applicant provide for fishing around the operation, within reason, taking into account security and other factors, and promote this opportunity to the community through education and outreach about the project.*

Response: Fishing around the array would not be prohibited, subject to compliance with existing navigational rules of the road. However, to help ensure the safety of personnel, reduce the risk of maritime collision, and preserve cultured fish stocks, protected species, and marine mammals, real-time position reporting will not be provided. Outreach and education events are continuously being undertaken by Kona Blue, including various community lectures, participation in workshops and conferences as well as organized media events (e.g., television, newspaper, radio, etc.).

V. *The Council suggests that these distinguishing marks or characteristics of the cultured species be documented with comparisons to wild stock to provide outreach to the fishermen and the community.*

Response: Kona Blue has not historically marked their product for operations in State waters, nor are they required under existing regulations to do so. Kona Blue does not plan to mark the cultured species for this small scale demonstration project. Pit tags may be an alternative; however, given the small number of culture fish, distance from wild stock habitat, and presence of predators, pit tags are not required for the proposed action.

VI. *The Council suggests that the NMFS require this type of emergency plan be developed prior to approval of the permit.*

Response: Kona Blue has an established emergency plan which is included as Appendix D to the EA.

VII. *The Council suggests that NMFS request a timeline of activities from the applicant and base the permit expiration date accordingly.*

Response: The permit will be valid for one year from the date of issuance, and accounts for the length of time required once the CuPod is stocked with fish (e.g., 8-10 month cycle).

VIII. The Council requests, as a condition of the permit, NMFS require the applicant to allow a NOAA observer on the tendering vessel during stocking, monitoring, and/or harvesting activities to collect additional information, as well as any protected species sightings/interactions.

Response: As more fully discussed in section (insert), aquaculture operations in Hawaii are Category 3 fisheries under the MMPA, section 118. Accordingly, placement of observers may be authorized under limited circumstances, such as when the fishery contributes to immediate and significant adverse impacts on ESA-listed marine mammals, or when the owner consents. Kona Blue has expressed openness to an observer/monitor for the demonstration project as requested. Kona Blue encourages third party monitoring opportunities, and is currently working with the University of Hawaii to provide additional research support, such as marine mammal monitoring.

IX. Why does Kona Blue receive National Science Foundation (NSF) funding?

Response: PIRO is aware of Kona Blue's research activities, including those funded by the NSF, and recognizes the need for such research. Demonstration projects, such as the proposed activity, build upon knowledge gained from prior research studies, and contribute to the general pool of information associated with open ocean aquaculture.

X. Will the vessels associated with the project be required to be registered?

The tender vessel being used with the new gear is documented with the U.S. Coast Guard and is expected to comply with applicable navigation requirements. The tender vessel also has a Coast Guard document with a commercial fishing endorsement. Support and supply vessels will be required to have all registrations and navigation requirements needed to operate in waters around Hawaii as well. Some of the support and supply vessels being used, including the transshipment vessel, have been associated with existing aquaculture operations in State waters.

XI. Fishermen familiar with existing aquaculture operations in State waters are concerned about the impacts to wild stocks from escapes, composition of feed as well as the operation acting like a FAD.

These concerns are addressed in various sections throughout the EA, including sections 1.3, 4.6, 4.7 and 4.8.

7 Consistency with Applicable Laws

7.1 National Environmental Policy Act (NEPA).

The environmental impact analysis of this EA fulfills the requirements of the National Environmental Policy Act (NEPA) and the National Oceanic and Atmospheric Administration's (NOAA) Administrative Order 216-6 covering the agency's need to analyze the environmental impacts of a proposed federal action. The purpose and need, description of alternatives and an environmental analysis of the proposed action can be found in sections 1, 2 and 3 of this EA, respectively.

7.1.1 List of Preparers

NOAA Contactor

John S. Corbin, MS, CFP, AICP, Coral Reef Management Specialist
Joint Institute of Marine and Atmospheric Research, University of Hawaii, Honolulu, HI

Mr. Corbin has over 30 years experience in aquaculture research, planning and development. He researched and co-authored *Aquaculture Development for Hawaii*, the first comprehensive state aquaculture plan in the nation. In 1978, he became manager of the State Hawaii Development Program, which carried out planning and policy development, provision of industry support services and funding of research and development projects. While manager, a position he held until 2006, he and his staff assisted hundreds of businesses, from small family farms to large corporate commercial enterprises, in selection of species and technologies, siting, permits, operations improvement, health management, and product marketing. In 1999, he led an effort to amend Hawaii's ocean leasing law to allow commercial cage culture, co-authoring the amendments. From 2000 to 2003, Mr. Corbin worked with a team from the Center for Marine Policy, University of Delaware, on two studies for Congress, addressing: 1) development of a policy framework for the U.S. Exclusive Economic Zone (USEEZ); and, 2) operational guidelines for aquaculture in the USEEZ. He received his B.S. in Zoology and Chemistry from the University of Miami and M.S. in Biological Oceanography from the University of Hawaii. He is certified as a Fisheries Professional by the American Fisheries Society; Planner by the American Institute of Certified Planners; and, State Manager by the State Department of Human Resource Development and the U.S. Office of Personnel Management. Since leaving state government at the end of 2006, he established a company to offer expertise in aquaculture planning, permitting and business development, particularly for island settings.

NOAA NMFS Preparer

Toby Wood, Policy Analyst, Sustainable Fisheries Division

NOAA NMFS Reviewers

Phyllis Ha, NEPA Specialist, Sustainable Fisheries Division

Ethan Brown, Resource Management Specialist, Sustainable Fisheries Division

7.1.2 Agencies Consulted

NOAA

National Marine Fisheries Service, Pacific Islands Regional Office

NMFS, PIRO, Sustainable Fisheries Division

NMFS, PIRO, Protected Resources Division

MFS, PIRO, Habitat Conservation Division

Western Pacific Regional Fishery Management Council

State of Hawaii Department of Land and Natural Resources

State of Hawaii Department Of Agriculture, Aquaculture & Livestock Support Services

Office of Hawaiian Affairs

U.S. Fish and Wildlife Service, Pacific Islands Office, Ecological Services

U.S. Coast Guard, Waterways Management Division

U.S. National Park Service

7.1.3 Public Review

The draft EA was posted on the NMFS PIR website at: http://www.fpir.noaa.gov/ on March 17, 2011 for a 10-day public comment period. The EA was available online or through the mail. The comment period closed March 27, 2011.

The draft EA advised reviewers that NMFS considered its proposal to issue a permit authorizing the culture and eventual harvest of up to 20,000 lb of *Seriola rivoliana*, a native fish using a floating cage pen in the U.S. EEZ around Hawaii to be a relatively small scale demonstration of the application that would have little risk of significant adverse environmental impacts

During the public comment phase (from March 17-March 27, 2011), NMFS received a total of 42 letters including 41 unique responses and a single letter that was duplicated several thousand times in an email campaign. Of the unique responses, two were joint letters signed by representatives of numerous associations representing a range of non-governmental organizations including sportsfishers, food safety groups, environmental groups, and ocean advocacy groups. Most letters were from individuals and two were from government agencies. Several of the individual comment letters provided recommendations to improve the overall analysis in the EA and made suggestions on policy concerns, user conflicts, and cited well known impacts affiliated with aquaculture production (e.g., disease, escapes, chemical treatment, feed, etc.).

Summary of comments:

Comments were generally opposed to approving and issuing the proposed permit, primarily based upon concerns about the potential environmental impacts of ocean aquaculture. Some comments were very specific to the proposed action. For example, a resident asked about impacts to viewplanes and noise from the Kona coast and upslope areas and the National Park Service requested consideration of park resources including protected species and viewplanes. Most of the comments can be grouped into a limited number of concerns, as more fully described below.

NMFS modified and elaborated on the project description and area of potential impact. The agency:

- modified the description of the project based on a revised application from KBWF. The revision was due to results of sea trial tests with empty Cupods. The scope is now reduced from that in the draft EA and the final EA now analyzes the impacts of a single, smaller CuPod that would be stocked with 2,000 fingerlings;
- added information describing results of sea trials with two pods;
- enhanced description of the project in relation to two harbors: Kawaihae Harbor and Honokohau Harbor and review of potential impacts to the harbors and adjacent Kaloko-Honokohau National Historical Park resources;
- clarified the scope of activities that would be authorized as part of the permit. The permit would authorize the culture and harvest of *Seriola rivoliana.* Related activities analyzed in the EA include transshipment, stocking, maintenance, culture, and harvest of the fishes. NMFS clarified that the sea trials, towing, launching, and servicing of the tender vessel and pod are

not part of the scope of the proposed action as these do not require a permit to take place in State or Federal waters and are currently under way; and NMFS

- described additional permit conditions. NMFS added a condition that GSP transmitter and radar reflector buoy be required to be installed on the pod before stocking with fish.

NMFS modified and elaborated on the potential effects on the physical environment. NMFS:

- described visibility of lighting on Cupod and ship array from shore and visibility of pod from the Kaloko-Honokohau NHP;
- re-evaluated whether noise impacts would be significant; and
- evaluated potential effects of storms and weather patterns on the Cupod.

In response to public comments, NMFS modified the potential effects analysis on biological resources. NMFS:

- revised the biological effects analysis to consider the use of only one CuPod operation;
- described the low likelihood of fish escapes with the new Cupod, but based impact analysis on a potential for escapes of the cultured fish. NMFS addressed the potential for escaped fish to result in genetic modification to wild stocks of the same species.
- added enhanced discussion of the potential occurrence of, and effects on, false killer whales and humpback whales;
- corrected population number references for humpback whales based on census information provided by a researcher; described potential effects to major calving and resting grounds of Hawaiian humpback whales; evaluated the potential for vessel strikes; impacts to critical habitat; and the potential impact on protected species from sharks attracted to fish aggregating at the array;
- elaborated on potential disease impacts and described that any in-water treatment must be approved by a competent federal or state agency and is not authorized by the proposed permit. The potential for bio-magnification of disease in the Cupods was considered low because of the high amount of monitoring, low stocking densities, and open water flow;
- analyzed the potential for the operation to attract large sharks to shore and endangering public safety;
- addressed the potential for interactions with dolphins by fishermen who may be attracted to fish on the pod.

NMFS enhanced the discussion of the operational features to include:

- clarification that retrieval of pod, should it become detached, would be the responsibility of KBWF;
- clarification that maritime hazards from the pod are the responsibility of KBWF. The pod, tender lines, and tender vessel would have approved U.S. Coast Guard safety requirements (e.g., marking and lighting) while at sea.

<u>Administrative and policy comments:</u>

Although not related to the environmental assessment, NMFS modified the EA and project description to more fully cover the following topics that referred to administrative or policy comments:

Authority: Several comment letters expressed concern that NMFS does not have the authority to permit aquaculture activity using a fishing permit. NMFS disagrees. The authority for issuing the permit for the harvest of this management unit species is provided in appropriate regulations defined under the Hawaii

FEP. Another related comment was that aquaculture is not considered a fishery under the current Hawaii FEP. Although the Hawaii FEP address "Aquaculture Facilities" as a 'nonfishing activity' in the context of evaluating potential impacts to habitat used by MUS, these categories within the FEP are provided only to serve as best management practices to protect habitat and do not supersede MSA and NOAA policy, which provide that aquaculture activities are subject to management by NMFS under the MSA.

Precedent and a national impact: Some comment letters expressed concern that if NMFS were to issue the proposed SCREFP and authorize harvest of finfish using a floating pod as a gear to harvest a Coral Reef Ecosystem management unit species, that this would open NMFS to a flood of applications for permits by operators wishing to undertake oceanic aquaculture in federal waters across the nation. In addition to this concern about national precedent and a flood of subsequent requests for permits, another similar topic was a concern that the current permit would automatically lead to applications for industrial-scale ocean culture activities.

NMFS evaluated this comment and finds no evidence to support the concern expressed that there will be a nationwide rush to permit aquaculture activities using fishery permits. First, the approved Hawaii FEP and NMFS regulation specifically provide for the rare circumstance where, as here, an applicant demonstrating the requisite experience may request the use of an unapproved gear type to harvest MUS. Each such application must undergo environmental review and coordination prior to an approval decision. The current application is a one-time permit limited in both scope and duration.

Regarding concerns that the proposal would hasten the development, approval, and implementation of industrial-scale ocean aquaculture, there is no evidence to conclude that approval of the current permit would have a cumulative effect of speeding up the approval of larger-scale projects. Each application would need to be coordinated in accordance with the permit process, and would need to comply with all applicable laws including project-specific environmental review. Approval of the proposed activity is consistent with NOAA's national aquaculture policy, which seeks to encourage and foster sustainable aquaculture development in harmony with healthy, productive, and resilient marine ecosystems, compatible with other uses of the marine environment, and consistent with the National Ocean Policy. Marine spatial planning initiatives and increasing focus on developing aquaculture permit processes consistent with NOAA's aquaculture policy may result in new guidelines and regulations to guide the planning, development, siting, permitting, leasing, and operation of future facilities.

Timing: Some comment letters communicated opposition to the permit being issued in advance of a final national aquaculture policy. The NOAA's marine aquaculture policy was finalized before the EA was finalized. The proposed action is consistent with NOAA aquaculture policy goal of developing sustainable aquaculture to meet the increasing demand for safe, local, and sustainably produced seafood, while reducing dependence on stressed wild fish stocks and foreign suppliers.

Length of public comment period too short: Several comment letters were concerned about a 10-day comment period. Some of the commenters felt this was inadequate and did not allow for thorough public involvement. One comment showed concern that 'permitting agencies' were allotted 30 days to review the project, while members of the public only were allowed 10 days. The State Office of Environmental Quality Control (OEQC) requested the opportunity to publish the draft in its bulletin, *Environmental Notice.*

CEQ regulations and NOAA's NEPA policies do not currently require a fixed public comment period for environmental assessments. However, consistent with the National policy goal of ensuring science-based, transparent, and efficient processes for permit reviews, NMFS decided upon a ten day public comment period which would still allow the agency to meet the applicable deadline for acting on the coral reef ecosystem fishing permit (50 CFR §665.224). NMFS also addressed the permit application in two

public meetings of the Western Pacific Fishery Management Council. During the public comment phase the agency received 41 letters and approximately 3,000 copies of a mass-emailed letter, which drew interest and exposure from local and national news media. NMFS is satisfied that the public comment period was adequate to inform the public of the proposed activity and to solicit public comments that would aid in agency decision-making.

Additional comments:

A comment was received in support of the permit request, citing that the proposal fits with the long history of innovation and is consistent with NOAA's (now finalized) draft aquaculture policy.

NMFS received a comment addressing Hawaiian sovereignty and challenging NMFS' authority to issue permits in waters of the U.S. EEZ. NMFS authority under MSA to issue a permit for the project in the EEZ is documented in the EA.

The carbon footprint of the project was a source of comment because the harvested fish are shipped to some markets by air and the fish food is obtained from far away. This was not a focus of the environmental impact because the amount of food and air transport is very minor compared to the transportation logistics used in the current baseline. In addition, the distribution of the cultured fish is beyond the scope of the permit.

A concern raised about the use of soy in the fish food also was not considered a significant adverse effect because the fish would be carefully fed to minimize wasted food, because the amount of soy that might enter other fish is very small, and because the very small amounts of soy that would enter the environment would not be at levels that would be considered dangerous or polluting. Furthermore, supplementing wild caught fish with soy in feed production is widely accepted in the industry, can promote domestic agriculture production, and is a common practice used to increase the efficiency and sustainability of cultured fish in general.

7.2 Magnuson-Stevens Act (MSA)

Implementation and regulations concerning the Special Permit for Coral Reef Ecosystem Fisheries fall under the Hawaii Archipelagic Fishery Ecosystem Plan which is consistent with the MSA and National Standards contained therein. Additional compliance requirements can be found in the Hawaii FEP (WPFMC 2009c) and are briefly discussed in sections 1.3.2 and 2.2.4 of this EA.

7.3 Paperwork Reduction Act (PRA)

The PRA for this action is covered by OMB Control Number 0648-0462 and is valid until 08/31/2012. This covers information collected under a special permit for coral reef fisheries and includes 1) the Coral Reef Ecosystem Daily Catch Report as well as 2) the Pacific Islands Region Coral Reef Ecosystem Transshipment Log (see Appendix C).

7.4 Coastal Zone Management Act (CZMA)

The CZMA requires that any required federal license or permit activity affecting any coastal use or resource be conducted in a manner consistent with the State's approved coastal zone management program. The State is required to maintain a list of federal license and permit activities which affect any coastal use or resource, and which the State wishes to review for consistency with its management program. For those license and permit activities that are not on the State's list, the federal agency is

required to provide the State with actual or constructive notice of the proposed activity so the State may determine, within 30 days of such notice, whether coastal effects are reasonably foreseeable. Aquaculture is not on the list of license and permit activities which Hawaii wishes to review for consistency. Pursuant to 50 CFR §665.224 and 15 CFR § 930, as a condition of issuing a special permit under the Hawaii FEP, on February 3, 2011, PIRO mailed a copy of the completed application package to the State of Hawaii with a request for recommendations concerning this project. No recommendations were provided within the 30-day response period. Additional consideration was given to the fact that the State of Hawaii has permitted nearshore operations on an industrial scale, including issuing permits for Kona Blue through a rigorous permitting process overseen by the U.S. Army Corps of Engineers. Knowledge of Kona Blue's State operations helped inform some of the analysis in this EA and is referenced accordingly throughout this document. Additionally, no effect on State resources is anticipated as the proposed action will be limited to in Federal waters (aside from minimal transit to and from Kona Blue's dock). Further CZMA compliance measures covering both Coral Reef and Pelagic Ecosystems can be found in the Hawaii FEP and the Pelagic FEP respectively (WCPFC 2009c and 2009d).

7.5 Clean Water Act (CWA)

The National Pollutant Discharge Elimination System (NPDES) program (CWA Section 402) controls direct discharges into navigable waters. The proposed activity falls below the EPA commercial culture thresholds (i.e., the project size would involve less than100,000 lb of fish) and is, therefore, not subject to a NPDES permit due to the small scale of the proposed activity. NPDES discharge requirements are regulated by the Environmental Protection Agency (EPA) and are discussed in section 5.1of1 this EA as they pertain to the proposed activity.

7.6 Marine Mammal Protection Act (MMPA)

The MMPA prohibits, with certain exceptions, the take of marine mammals in the U.S. and by U.S. citizens on the high seas, and the importation of marine mammals and marine mammal products into the United States.

Pursuant to the MMPA, NMFS has promulgated specific regulations that govern the incidental take of marine mammals during fishing operations (50 CFR 229). In accordance with section 118 of the MMPA, NMFS publishes, at least annually, a List of Fisheries (LOF) that classifies U.S. commercial fisheries into one of three categories. These categories are based on the level of serious injury and mortality of marine mammals that occurs incidental to each fishery.

- Category I designates fisheries with frequent serious injuries and mortalities incidental to commercial fishing;
- Category II designates fisheries with occasional serious injuries and mortalities; and
- Category III designates fisheries with a remote likelihood or no known serious injuries or mortalities.

The list includes mammal species and stocks incidentally killed or injured in each fishery based on observer data, logbook data, stranding reports, disentanglement network data, and fisher reports.

The List of Fisheries (LOF) for 2011 identifies commercial marine aquaculture under the MMPA as Category III (75 FR 68468; November 8, 2010). Table 1 shows all U.S. marine aquaculture fisheries evaluated under the MMPA for the 2011 LOF (75 FR 68468; November 8, 2010). The proposed activity

is generally consistent with existing fisheries that have been identified as Hawaii offshore pen culture activities.

Fishery Description	Estimated # of vessels/ persons	Marine mammal species/ stocks incidentally killed/ injured
Category III: Pacific Ocean		
MARINE AQUACULTURE FISHERIES:		
CA marine shellfish aquaculture	unknown	None documented
CA salmon enhancement rearing pen	>1	None documented
CA white seabass enhancement net pens	13	▪ California sea lion, U.S.
HI offshore pen culture	2	None documented
OR salmon ranch	1	None documented
WA/OR salmon net pens	14	▪ California sea lion, U.S. ▪ Harbor seal, WA inland waters
Category III: Atlantic, Gulf of Mexico and Caribbean		
MARINE AQUACULTURE FISHERIES:		
Finfish aquaculture	48	▪ Harbor seal, WNA
Shellfish aquaculture	unknown	None documented

Table 1. MMPA List of Fisheries 2011: Marine Aquaculture Fisheries. (Source: NOAA, 2011)

MMPA Reporting Requirements

The proposed activity is a Category III Fishery in the List of Fisheries, as it is consistent with two existing operations that have been classified as "Hawaii Offshore Pen Culture" by NOAA. If the SCREP permit is approved, the applicant will be required to complete a Marine Mammal Authorization Form for any marine mammal injury or mortality and comply with other requirements of the MMPA (see §229.5 of the MMPA provided below). The MMPA reporting forms would be provided to the applicant with the permit. To date, no injuries or mortalities have been associated with the existing offshore pen culture facilities in Hawaii, and none are expected under the proposed project17. In general, regulations governing Category III fisheries, which include Hawaii offshore aquaculture fisheries, are listed below (50 CFR 229.5): 18

§ 229.5 Requirements for Category III fisheries

(a) *General*. Vessel owners and crew members of such vessels engaged only in Category III fisheries may incidentally take marine mammals without registering for or receiving an Authorization Certificate.

[17] http://www.nmfs.noaa.gov/pr/interactions/lof/final2011.htm

[18] http://law.justia.com/cfr/title50/50-7.0.1.3.10.html

(b) *Reporting.* Vessel owners engaged in a Category III fishery must comply with the reporting requirements specified in §229.6.

(c) *Disposition of marine mammals.* Any marine mammal incidentally taken must be immediately returned to the sea with a minimum of further injury unless directed otherwise by NMFS personnel, a designated contractor, or an official observer, or authorized otherwise by a scientific research permit in the possession of the operator.

(d) *Monitoring.* Vessel owners engaged in a Category III fishery must comply with the observer requirements specified under §229.7(d).

(e) *Deterrence.* When necessary to deter a marine mammal from damaging fishing gear, catch, or other private property, or from endangering personal safety, vessel owners and crew members engaged in commercial fishing operations must comply with all deterrence provisions set forth in the MMPA and any other applicable guidelines and prohibitions.

(f) *Self-defense.* When imminently necessary in self-defense or to save the life of a person in immediate danger, a marine mammal may be lethally taken if such taking is reported to NMFS in accordance with the requirements of §229.6.

(g) *Emergency regulations.* Vessel owners engaged in a Category III fishery must comply with any applicable emergency regulations.

§ 229.6 Reporting requirements

(a) Vessel owners or operators engaged in any commercial fishery must report all incidental mortality and injury of marine mammals in the course of commercial fishing operations to the Assistant Administrator, or appropriate Regional Office, by mail or other means, such as fax or overnight mail specified by the Assistant Administrator. Reports must be sent within 48 hours after the end of each fishing trip during which the incidental mortality or injury occurred, or, for nonvessel fisheries, within 48 hours of an occurrence of an incidental mortality or injury. Reports must be submitted on a standard postage-paid form as provided by the Assistant Administrator. The vessel owner or operator must provide the following information on this form:

(1) The vessel name, and Federal, state, or tribal registration numbers of the registered vessel;
(2) The name and address of the vessel owner or operator;
(3) The name and description of the fishery, including gear type and target species; and
(4) The species and number of each marine mammal incidentally killed or injured, and the date, time, and approximate geographic location of such occurrence. A description of the animal(s) killed or injured must be provided if the species is unknown.

(b) Participants in nonvessel fisheries must provide all of the information in paragraphs (a)(1) through (a)(4) of this section except, instead of providing the vessel name and vessel registration number, participants in nonvessel fisheries must provide the gear permit number.

§ 229.7(d) Monitoring of incidental mortalities and serious injuries.

(d) *Observer requirements for participants in Category III fisheries.* (1) The Assistant Administrator may place observers on Category III vessels if the Assistant Administrator:

(i) Believes that the incidental mortality and serious injury of marine mammals from such fishery may be contributing to the immediate and significant adverse impact on a species or stock listed as a threatened species or endangered species under the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*.); and

(ii) Has complied with §229.9(a)(3)(i) and (ii); or
(iii) Has the consent of the vessel owner.

(2) If an observer is placed on a Category III vessel, the vessel owner and/or operator must comply with the requirements of §229.7(c).

All of the above requirements would apply to the permittee.

7.7 Endangered Species Act (ESA)

Section 7 of the ESA requires a federal agency to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any endangered or threatened species, or destroy or adversely modify designated critical habitat. Technical consultations with the Protected Resources Division (PRD) were ongoing throughout the proposal process. PIRO addressed ESA issues that are discussed in the EA, including, but not limited to, entanglements, gear design, mitigation techniques, noise concerns or other potential impacts to ESA listed species. On July 6, 2011 NMFS PIR completed an informal consultation and the determination has, therefore, been made that the proposed activity may affect, but will not likely adversely affect endangered or threatened species that could occur in the proposed action area. No additional conservation measures were required as part of the informal consultation. A thorough discussion of the potential impacts to listed species, along with other protected species, can be found in section 4.9.

7.7.1 Critical Habitat

There is currently no established critical habitat for ESA-listed species within the proposed action area. However, NMFS recently published a proposed rule (76 FR 32026; June 2, 2011) that would extend monk seal critical habitat in the Northwestern Hawaiian Islands, and designate six new areas in the main Hawaiian Islands, including an area that would be utilized by vessels entering and exiting both Honokohau and Kawaihae boat harbors. While the harbors themselves would not meet the definition of critical habitat, federal waters existing out to the proposed 500 meter depth contour would overlap a small portion of the action area between Honokohau and Kawaihae harbors. The proposed action would not be expected to alter the essential features of proposed monk seal critical habitat. Specifically, it would occur well off shore and would not affect the characteristics of any pupping or nursing areas, would not increase anthropogenic disturbance at any haul-out areas, and would not alter shallow sheltered aquatic areas adjacent to pupping or nursing sites or to haul-out areas in general. Additionally, the proposed action would not alter marine foraging areas, and none of the activities associated with the proposed action would be expected to affect the habitat's foraging characteristics, or prey quantity or quality. If designated, the proposed activity would not be expected to destroy or adversely modify critical habitat.

7.7.2 Protected Species Impact Summary

Sea-based aquaculture operations may alter an animal's behavior or provide an entanglement risk to marine species in general. Additionally, a floating object in the ocean, such as the CuPod, will naturally act like a FAD, and may attract marine mammals and/or sea turtles to the operation. The CuPod is likely to attract shark species as well, which may affect the behavior of protected species indirectly. Effluents, noise, vessel collisions and shipboard wastes are other concerns that are commonly associated with aquaculture operations when assessing potential impacts to endangered species and are discussed in greater detail in section 4.9.2. The small footprint of the velella array, the rigidity of the mesh, the constant motion of the CuPod array, small stocking density and the short-term duration of the proposed activity are all expected to minimize any long-term or adverse behavior changes that could accompany a more permanent, or anchored operation. Furthermore, the gear being tested is, by design, expected to minimize the likelihood of entanglements as compared to typical aquaculture nets and fishing gear (e.g., chain-link cage is an improvement over more flexible, traditional-type netting that marine species could become entangled or could tear and allow fish to escape).

7.8 Essential Fish Habitat (EFH)

EFH and HAPC areas have been delineated in the Hawaii FEP. A brief description of these areas of fishery management concern is provided in section X. PIRO SF consulted with PIRO Habitat Conservation Division (HCD) on the potential impacts to EFH and HAPC HCD concurred that there will be no significant impacts to EFH and HAPC under the proposed activity. Impacts to EFH can be found in section 4.4.1. Additional information is provided below for reference.

Description of General Mitigation Measures for Identified Activities and Impacts

Established policies and procedures of the Council and NMFS provide the framework for conserving and enhancing EFH. In general these may be considered best management practices (BMPs) that can help to minimize or avoid the adverse effects of identified activities on EFH. Components of this framework include adverse impact avoidance and minimization, provision of compensatory mitigation whenever the impact is significant and unavoidable, and incorporation of enhancement.

In assessing the potential impacts of the proposed project NMFS was guided by the following general considerations:

• The extent to which the activity would directly and indirectly affect the occurrence, abundance, health, and continued existence of fishery resources.

• The extent to which the potential for cumulative impacts exists.

• The extent to which adverse impacts can be avoided through project modification, alternative site selection, or other safeguards.

• The extent to which the activity is water dependent if loss or degradation of EFH is involved.

• The extent to which mitigation may be used to offset unavoidable loss of habitat functions and values.

Additionally, the Hawaii FEP for coral reef fisheries (WPFMC 2009c) identifies aquaculture activities that could directly or indirectly affect habitat used by MUS. Impacts and conservation measures are summarized below as they address aquaculture facilities, and in particular cage/net pen use (#4 and #6).

Impacts

• Discharge of organic waste from the farms

- Impacts to the seafloor below the cages or pens (including moorings or anchors)
- Introduction of disease through transmission from cultured organisms to wild stocks.

Conservation Measures

The following general conservation measures are included in the Hawaii FEP and were considered by NMFS in developing permit terms and conditions. The FEP recommends that:

1. Facilities should be located in upland areas as often as possible. Tidally influenced wetlands should not be enclosed or impounded for mariculture purposes. This includes hatchery and grow-out operations. Siting of facilities should also take into account the size of the facility, the presence or absence of submerged aquatic vegetation and coral reef ecosystems, proximity of wild fish stocks, migratory patterns, competing uses, hydrographic conditions, and upstream uses. Benthic productivity should be determined by sampling prior to any operations. Areas of high productivity should be avoided to the maximum extent possible. Sampling design should be developed with input from state and federal resource agencies.

2. To the extent practicable, water intakes should be designed to avoid entrainment and impingement of native fauna.

3. Water discharge should be treated to avoid contamination of the receiving water and should be located only in areas having good mixing characteristics.

4. Where cage mariculture operations are undertaken, water depths and circulation patterns should be investigated and should be adequate to preclude the buildup of waste products, excess feed and chemical agents.

5. Non-native, ecologically undesirable species that are reared may pose a risk of escape or accidental release, which could adversely affect the ecological balance of an area. A thorough scientific review and risk assessment should be undertaken before any nonnative species are allowed to be introduced.

6. Any net pen structure should have small enough webbing to prevent entanglement of prey species.

7. Mitigation should be provided for the EFH areas impacted by the facility.

The consultation with PIRO did not reveal additional conservation measures that would be needed in order to protect EFH and HAPC.

7.9 Fish and Wildlife Coordination Act (FWCA)[19]

Pursuant to regulations governing the special coral reef ecosystem fishing permit (50 CFR §665.224), PIRO, by letter of February 3, 2011, sent information pertaining to the application of this project to the U.S. Fish and Wildlife Service (USFWS) which has jurisdiction over ESA-listed seabirds. PIRO followed up with the initial application procedure and notified the USFWS as to the availability of the draft EA and public comment period. No comments were provided by the USFWS and no effects on seabirds are expected to occur as a result of the proposed activity.

[19] http://www.fws.gov/habitatconservation/fwca.html

7.10 National Marine Sanctuaries Act (NMSA)[20]

§ 922.187 Interagency Cooperation.

Under section 304(d) of the NMSA, Federal agency actions internal or external to a national marine sanctuary, including private activities authorized by licenses, leases, or permits, that are likely to destroy, cause the loss of, or injure any sanctuary resource are subject to consultation with the Director. The Federal agency proposing an action shall determine whether the activity is likely to destroy, cause the loss of, or injure a Sanctuary resource. To the extent practicable, consultation procedures under section 304(d) of the NMSA may be consolidated with interagency cooperation procedures required by other statutes, such as the ESA. The Director will attempt to provide coordinated review and analysis of all environmental requirements. PIRO has determined that, aside from transiting the Sanctuary while exiting the harbors, that the proposed activity will not occur in within Hawaiian Islands Humpback Whale National Marine Sanctuary boundaries. Consultation with Sanctuary staff was initiated to coordinate a spatial analysis of the proposed activity. Revisions to the action area depicted within the draft EA were redrawn in this EA to satisfy noted concerns. In addition, Appendix F was added to this EA to illustrate the Sanctuary boundary in relation to the harbors that would be utilized by Kona Blue to support the proposed activities in federal waters.

7.11 National Historic Preservation Act (NHPA)

Section 106 of the NHPA requires the agency to "take into account the effect of (an) undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register (of Historic Places)" 16 U.S.C. § 470f. 34 CFR §800.16(i) defines "effect" to mean "alternation to the characteristics of a historic property qualifying it for inclusion in or eligibility for the National Register." A historic property means any prehistoric or historic district, site, building, structure, or object included in, and includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria. 34 CFR § 800.16(l)

NMFS has determined that there may be historical properties present in the area of potential effect because the boundaries of Kaloko-Honokohau National Historical Park and Honokohau Settlement National Historic Landmark include federal and state lands on either side of Honokohau Small Boat Harbor and marine waters offshore of Honokohau Small Boat Harbor (see Appendix E). Support vessels, as described in section 1.3.6, could transit the marine waters of the Historical Park on a weekly basis. The proposed action area is described in section 1.3.1 of the EA.

As described in section 4.13 of the EA, the proposed activity is expected to involve a limited number of support vessels entering and exiting Honokohau Small Boat Harbor on a weekly basis to deliver provisions and remove and land product and waste. This activity would not involve a material increase in vessel traffic nor a material change in harbor operations. The vessels to be used are currently operating out of Honokohau Small Boat Harbor in support of the applicant's aquaculture facilities in state waters. In addition, the proposed activity does not involve the destruction, modification, or alteration of land, substrate, or habitat, or other properties. The towed CuPod and tender vessel would remain at least 3 nautical miles from shore when in operation and would not introduce visual, atmospheric, or audible elements that might affect the features of any historic property. Accordingly, NMFS has determined that the proposed activity does not have the potential to cause effects to historic properties, assuming historic properties are present, and no further obligations are required under NHPA section 106. 36 CFR 800.3. A letter documenting this determination has been sent to the Hawaii State Historic Preservation Division.

[20] http://sanctuaries.noaa.gov/about/legislation/

Literature Cited

Anderson, J. and G. Shamshack. 2008. Future Markets for Aquaculture Products. pp. 23-24 In: Offshore Aquaculture in the United States: Economic Considerations, Implications and Opportunities. Washington, D.C.: NOAA, USDOC. Available at [http://aquaculture.noaa.gov/news/econ.html].

Baird, R.W. 2009. A review of false killer whales in Hawaiian waters; biology, status, and risk factors. Report prepared for the U.S. Marine Mammal Commission under order No. E40475499. Available from www.cascadiaresearch.org/hawaii/falsekillerwhale.htm

Baird, R. 2011. Public comment to draft EA citing Cascadia Research Collective. References available at [http://www.cascadiaresearch.org/hawaii/publications.htm]

Barlow, R.W. 2006. Cetacean abundance in Hawaiian waters estimated from summer/fall survey in 2002. Marine Mammal Science 22:446-464.

Calil, P.H.R., K.J. Richards, Y. Jia, and R.R. Bidigare. 2008. Eddy activity in the lee of the Hawaiian Islands. Deep-Sea Research II. 55:1179-1194.

Cicin-Sain, B.S., S. Bunsick, J. Corbin, M. DeVoe, T. Eichenberg, J. Ewart, J. Firestone, K. Fletcher, H. Halvorson, T. MacDonald, R. Rayburn, R. Rheault, and B. Thorne-Miller. 2005. Recommendations for an Operational Framework for Offshore Aquaculture in the U.S. Federal Waters. Lewes: U. of Delaware, Center for Marine Policy, 114 pp. Available at [http://darc.cms.udel.edu/sgeez/sgeez2final.pdf].

Corbin, J. 2010. "Sustainable U.S. Marine Aquaculture Expansion, a Necessity." Mar. Technol. Soc. J. 44(3):7-21.

Coyne, M.S., T.A. Battista, M. Anderson, J. Waddell, W. Smith, P. Jokiel, M.S. Kendall, and M.E. Monaco. 2003. Benthic Habitats of the Main Hawaiian Islands, NOAA Technical Memorandum. NOS, NCCOS, CCMA 152, County of Hawaii 2007. Available at [http://ccma.nos.noaa.gov/products/biogeography/hawaii_cd/].

Dickey, T.D., F. Nenciolia, V.S. Kuwahara, C. Leonard, W. Black, Y.M. Rii, R.R. Bidigare, and Q. Zhang. 2008. Physical and bio-optical observations of oceanic cyclones west of the Island of Hawaii. Deep-Sea Research II, 55, pp. 1195-1217.

Firestone, J., W. Kempton, A. Kruger, and C.E. Loper. 2004. Regulating Offshore Wind Power and Aquaculture: Messages from Land and Sea. Cornell Journal of Law and Public Policy, 14(1): 71-111. Available at: [http://www.ceoe.udel.edu/cms/jfirestone/WindAquaRegCJP.pdf]] Food and Agriculture Organization. 2009. The Status of World Fisheries and Aquaculture 2008. Rome: UNFAO, 176 pp. Available at [http://www.fao.org/docrep/011/i0250e/i0250e00.HTM].

Gilman, E., Zollett, E., Beverly, S., Nakano, H., Davis, K., Shiode, D., Dalzell, P. and Kinan, I. 2006, Reducing sea turtle by-catch in pelagic longline fisheries. Fish and Fisheries, 7: 2–23.

Government Accountability Office. 2008. Report to the Chairman, Committee on Natural Resources, House of Representatives. Offshore Marine Aquaculture, Multiple Administrative and Environmental Issues Need to be Addressed in Establishing a U.S. Regulatory Framework. GAO-08-594, 54 pp. Available at [http://aquaculture.noaa.gov/news/gao.html].

Hawaiian Islands Humpback Whale National Marine Sanctuary. 2011a. Maps, Charts, and GIS Data. Web site: [http://hawaiihumpbackwhale.noaa.gov/documents/maps.html]. Accessed February, 2011.

Hawaiian Islands Humpback Whale National Marine Sanctuary. 2011b. NOAA Whale Avoidance Guidelines. Web site: [http://hawaiihumpbackwhale.noaa.gov/explore/whale_guidelines.html]. Accessed February, 2011.

Hawaii Oceanic Technology. 2009. Final Environmental Impact Statement for the Ahi Aquaculture Project, Kohala Coast, Hawaii. Tetra Tech Inc., Honolulu, HI. 907 pp. Available at [http://gen.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Hawaii/2000s/2009-07-23-HA-FEIS-Ahi-Aquaculture-Kohala.pdf].

Hukilau Foods. 2009. Final Environmental Assessment, Proposed Expansion of Hukilau Foods Offshore Fish Farm, Mamala Bay, Oahu, Hawaii. Aquaculture Planning and Advocacy, LLC, Honolulu, HI. 166 pp. Available at [http://gen.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Oahu/2000s/2009-08-08-OA-FEA-Hukilau-Foods-Fish-Farm.pdf].

Johnson, B. 2009. Hydrogen Peroxide (35% PEROX-AID) Clinical Field Trial INAD 11-669. 2009 annual summary report on the use of hydrogen peroxide in clinical field efficacy trials. Aquatic Animal Drug Approval Partnership Program. USFWS, Bozeman, Montana. 13 pp.

Juvik, S.P. and J.O. Juvik. 1998. Atlas of Hawaii. 3rd Edition. Department of Geography, University of Hawaii Press, Honolulu, HI.

Kite-Powell, H.L., A. Knowlton, M. Brown. 2007. Modeling the effect of vessel speed on Right Whale ship strike risk. Project report for NOAA/NMFS Project NA04NMF47202394. Available at

[http://www.whoi.edu/cms/files/ship_strike_risk_and_vessel_speed_final_report_Apr_07_24304.pdf]

Kona Blue Water Farms, Inc. 2009. Final Supplemental Environmental Assessment for an Expanded Farm Lease Area for an Offshore Open Ocean Fish Farm Project Off Unualoha Point, Kona, Hawaii. KBWF, Kailua-Kona, HI. Available at [http://gen.doh.hawaii.gov/Shared%20Documents/EA_and_EIS_Online_Library/Hawaii/2000s/2009-05-08-HA-FSEA-Kona-Blue-Water-Aquafarm.pdf].

Miller, L.F.D. 2010. U.S. Coast Guard, Waterways Management Division, pers. comm.

National Oceanic and Atmospheric Administration (NOAA). 2008. Offshore Aquaculture in the United States: Economic Considerations, Implications & Opportunities. Washington, D.C.: NOAA. 261 pp. Available at [http://aquaculture.noaa.gov/news/econ.html].

NOAA. 2010. Revision of critical habitat for Hawaiian monk seals: Draft Biological Report. Available at: http://www.fpir.noaa.gov/Library/PRD/Critical%20Habitat/New_5.31.11/05-23-11_0648-BA81_DraftBiologicalReport.pdf

NOAA. 2011a. National Aquaculture Policy. Available at: http://aquaculture.noaa.gov/pdf/noaa_aquaculture_policy_2011.pdf

NOAA. 2011b. NOAA Aquaculture Program Grants for Finfish Aquaculture Projects. Web site: [http://aquaculture.noaa.gov/funding/by_topic_sups.html#3]. Accessed June 10, 2011.

Sims, N. 2010. Kona Blue Water Farms, Inc., pers. comm.

Skretting. 2010. Sustainable Raw Materials. Website: [http://www.skretting.com/internet/SkrettingGlobal/webInternet.nsf/wprId/68B4A81709CBC6ABC12574260025F55F!OpenDocument]. Accessed January, 2011.

Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor, and H.L. Miller (Eds.). 2007. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, U.K. and N.Y., U.S.A. Available at [http://www.ipcc.ch/publications_and_data/publications_and_data.shtml].

U.S. Department of Commerce. 2007. NOAA 10-Year Plan for Marine Aquaculture. Washington, D.C.: NOAA, USDOC, 24 pp. Available at [http://aquaculture.noaa.gov/].

Waldemar Nelson International Inc. 2001. Offshore Mariculture in the Gulf of Mexico: A Feasibility Report. Louisiana Sea Grant Program, Louisiana State Univ., Baton Rouge, LA. 223 pp. Available at [http://nsgl.gso.uri.edu/lsu/lsuh01001/lsuh01001index.html]

Western Pacific Regional Fishery Management Council. 2001. Coral Reef Ecosystem Fishery Management Plan. WPFMC, Honolulu, HI. Available at [http://www.wpcouncil.org/hot/].

Western Pacific Regional Fishery Management Council. 2009a. Aquaculture Policy. WPFMC, Honolulu, HI. 5 pp. Available at [http://www.wpcouncil.org/hot/].

Western Pacific Regional Fishery Management Council. 2009b. Final Programmatic Environmental Impact Statement, Toward an Ecosystem Approach for the Western Pacific Region: From Species-Based Fishery Management Plans to Place-Based Fishery Ecosystem Plans. NOAA, NMFS, PIRO and WPFMC, Honolulu, HI. Available at [http://www.wpcouncil.org/hot/].

Western Pacific Regional Fishery Management Council. 2009c. Fishery Ecosystem Plan for the Hawaii Archipelago. WPFMC, Honolulu, HI. Available at [http://www.wpcouncil.org/hot/].

Western Pacific Regional Fishery Management Council. 2009d. Fishery Ecosystem Plan for the Pacific Pelagic Fisheries of the Western Pacific Region. WPFMC, Honolulu, HI. Available at [http://www.wpcouncil.org/hot/].

Western Pacific Regional Fishery Management Council. 2011. Hawaii Archipelago Plan Team meeting April 12-13.

Appendices

Appendix A: Applicant Correspondence

1. Letter from Mr. Tosatto to Mr. Sims dated November 4, 2010 acknowledging request for authorization.
2. Special Coral Reef Ecosystem Fishing Permit Application Form submitted by Mr. Sims on November 5, 2010.
3. Letter from Mr. Tosatto to Mr. Sims dated November 24, 2010 requesting more information for the permit application.
4. Letter from Mr. Sims to Mr. Tosatto dated November 29, 2010 providing additional application information.
5. Letter from Mr. Tosatto to Mr. Sims dated December 21, 2010 acknowledging application is complete for review.

NOAA National Marine Fisheries Service
Pacific Islands Regional Office ATTN: SFD Permits
1601 Kapiolani Blvd. Suite 1110
Honolulu, HI 96814-4700
Ph: (808) 944-2200; FAX: (808) 973-2940

OMB Control No. 0648-0463
Expires: 8/31/2012

Special Coral Reef Ecosystem Fishing Permit Application Form

Applicant Information (Please print legibly) Date: 11/5/2010

Full Name or Business Name: KONA BLUE WATER FARMS, INC.

Taxpayer Identification Number (TIN): 27-2931886 Date of Birth/Incorporation: 2004

Business Mailing Address: PO BOX 4239, (Street, Apt.#) KAILUA-KONA, (City) HI (State) 96745 (ZIP)

Phone: 808 331 1188 X201 Cell: 808 989 2438 Fax: 808 331 8689 Email: neil@kona-blue.com

Vessel Name: S.S. MACHIAS Home Port: HONOLULU

Length (ft): LOA 82 FT Net Tonnage: 18 NRT Gross Tonnage: 35 GRT

Vessel: (check one) USCG Documentation (●); State License ( ); Vessel Registration Number: 289053

Vessel Operator:

Name: OCEAN CHARTER SERVICE, INC. Phone: 808 595 0219 Fax: 808 595 0219

Address: 1042 D (Street) ILIMA DR., (Apt.#) HONOLULU, (City) HI, (State) 96817 (ZIP)

Privacy Act Statement: Federal Regulations (at 50 CFR Part 665) authorize collection of this information. This information is used to verify the identity of the applicant(s) and to accurately retrieve confidential records related to federal commercial fishery permits. The primary purpose for requesting the TIN is for the collection and reporting on any delinquent amounts arising of such person's relationship with the government pursuant to the Debt Collection Improvement Act of 1996 (Public Law 104-134). Personal information is confidential and protected under the Privacy Act (5 U.S.C. 552a). Business information may be disclosed to the public.

Is this permit solely to transship coral reef ecosystem taxa received from another vessel around the EEZ of the Northwest Hawaiian Islands, the Pacific Remote Island Areas, or any other MPA? NO

Do you agree to accommodate an observer on board while fishing, if required? YES

Does vessel have an individual Vessel Monitoring System? NO

Does vessel have insurance covering removal/clean-up in event of a grounding? YES Name of Insurer: THOMPSON BUDAR AGENCY, HNL

Do you agree to submit daily log data within 30 days of returning to port? YES or transshipment log data within 7 days of returning to port? N/A

Check any special exemption for which you qualify and would like to be eligible for under this permit application (attach description of conditions under which you apply):

Other FMP ☐ Scientific Bioprospecting ☐ General Indigenous ☐ Indigenous use of live rock/coral ☐
Aquaculture seed stock of coral ☐

In which EEZ Management Subarea will fishing be conducted? (check only one)

Main Hawaiian Islands (●) American Samoa ( ) Guam ( )
Guam's Southern Banks ( ) CNMI ( ) PRIA (specify) ( )

Describe your intended fishing effort, general fishing grounds, gear to be used and methods of collection

Target Species or Taxa				Expected Incidental Species or Taxa		
Species Name	Expected Catch (lb) (#, wt.)	How will it be processed?[1]	Why harvested? [2]	Species Name	Expected Catch (lb) (#, wt.)	Keep?
Seriola rivoliana	20,000 lbs	Fresh	Food	None		

[1] Live, fresh, frozen, preserved, other
[2] Food, ornamental, research, other

Use back, if necessary; total expected catch during permit period for target species required for permit approval
Attach statement regarding objectives of fishing operation, estimated ecosystem, habitat and protected species impacts, and any additional information to help support approval of this application. Attach copy of USCG vessel documentation or state/territory vessel registration.
It is prohibited to file false information on any application for a fishing permit (50 CFR § 665.15(b)).

Signature: Date: 11/10/2010

Please return completed and signed application to: NMFS Pacific Islands Regional Office, ATTN: Permits
1601 Kapiolani Blvd., Suite 1110, Honolulu, HI 96814-4700

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 · Fax: (808) 973-2941

NOV 2 4 2010

Mr. Neil Anthony Sims
Kona Blue Water Farms
P.O. Box 4239
Kailua-Kona, HI 96745-4239

Dear Mr. Sims:

Thank you for applying for a Special Coral Reef Ecosystem Fishing Permit to test the feasibility of deploying and operating two unmoored submersible, brass-meshed pens stocked with *Seriola rivoliana* in Federal waters off the Kona coast of the Island of Hawaii. We have reviewed your application and determined that it is not yet complete. The consideration or your proposal requires a comprehensive assessment of the potential environmental impacts (direct, indirect and cumulative) of the proposed activity. To complete this assessment, information including, but not limited to, the content of feed pellets (i.e., percent of fishmeal/oils, antibiotics/medication), the frequency of feeding and tender vessel provisioning, monitoring of water quality, marine mammal interaction monitoring and mitigation, contingency planning (storm events/gear loss), and the anticipated amount of escaped fish is required.

Fortunately, much of this information may be contained in the April 2009 Final Supplemental Environmental Assessment (FSEA) document for Kona Blue Water's existing offshore fish farm. We would like to meet with you to discuss the additional information needed to complete your application and conduct the necessary analyses. Please contact Toby Wood, Fishery Policy Analyst, at (808) 944-2234 to arrange this meeting.

Sincerely,

Michael D. Tosatto
Acting Regional Administrator

KONA BLUE
KONA BLUE WATER FARMS

NMFS/PIRO
DEC - 6 2010

November 29, 2010

Michael Tossato
Acting Regional Administrator
NOAA, PIRO
1601 Kapiolani Blvd, Suite 1110
Honolulu, HI 96814-4700

Dear Michael,

Thank you for your letter of 11/24/2010, requesting additional information on our Special Coral Reef Ecosystem Fishing Permit application.

I will respond point-wise to the specific questions you raise:

1. The content of feed pellets (i.e. percent of fishmeal/oils, antibiotics/medication),

The feed that we will use in the Velella trial will be precisely the same feed formulation as that which is currently used on the Keahole Point grow-out site. This is produced by Skretting in Canada, and meets the highest standards for feedstuff quality and QA/QC in production.

One of the key tenets of Kona Blue's aspirations towards greater sustainability has been a relentless drive to reduce the amount of fishmeal and fish oil from reduction fisheries in our Kona Kampachi® diets. The feed as presently formulated contains 20% fishmeal (of which 10% is fishmeal from trimmings from processing in the B.C. hake fishery) and 10% fish oil. The reduction fishery products are derived from the Peruvian anchovetta fishery – the largest such fishery, and one of the most responsibly managed reduction fisheries in the world.

There are no prophylactic antibiotics or other medications included in the feed. We do not expect to have to use any therapeutants during the course of the Velella trial. This is because of the key characteristic of the Velella concept: the cultured fish are separated from any potential pathogen or parasite reservoir on wild reef fish by many miles, and are only exposed to open ocean seawater and pelagic fish species. There is therefore very little likelihood of transmittal of any parasite or pathogen from wild fish to the cultured fish (which is the usual vector for pathogen/parasites in the cultured animals). The Velella is essentially a pristine farm site for each new stocking. We therefore do not expect to see skin flukes or bacterial infections on these cultured fish.

The 2009 Final Supplemental EA details the use of therapeutants to treat the skin fluke and bacterial infections that have been found on fish at the Keahole Point farm site. In the unlikely event of any skin fluke infestation or bacterial infection in the Velella project, Kona Blue would seek the advice and guidance of an authorized veterinarian to direct us on the best course of action. If the veterinarian were to recommend use of any approved therapeutants, these would only be administered under the standard treatment protocols, and with the oversight of USFWS, under an approved INAD (Investigational New Animal Drug permit from FDA), as detailed in the 2009 Final Supplemental EA.

2. The frequency of feeding and tender vessel provisioning

As with the fish that are cultured on the Keahole Point grow-out site, the fish in the Velella trial will initially be fed 5 times per day. As the fish grow larger, then the frequency of feeding is reduced. By the time the fish are around 2 lbs (1 kg), they are only fed once per day. Fish are fed each time to a level just below satiation, to ensure that no excess feed is wasted, and to maximize the assimilation of the feed by optimizing digestive efficiency.

The tender vessel will be provisioned about once each week (when the Velella is within ready range of Kona); and less frequently if the Velella is carried further offshore by the eddies. These provisioning trips on a smaller vessel (25 – 35 ft Radon, or similar) will also provide opportunity for Kona Blue to change crews, and conduct other research at the Velella array. We would make every effort to accommodate NOAA scientists if they wished to accompany us on some of these trips.

The tender vessel should be able to carry sufficient feed to sustain operations for around 6 months. At this point, a smaller vessel will assume the role of the tender, allowing the larger tender to return to Kawaihae Harbor and re-load the feed for the final four months of grow-out. The entire grow-out will therefore be accomplished by just a single round trip of the tender vessel from the array to the harbor.

3. Monitoring of water quality

Kona Blue has been monitoring the water quality around the Keahole Point grow-out site over the past five years. We have made the data from this available on our web site, at www.kona-blue.com. These data demonstrate overwhelmingly that there is no detectable impact on water quality from the Keahole Point operation, even when production volumes peaked at around 500 tons per year (in 2008).

The Velella project will only harbor around 6,000 fish, versus the almost 500,000 fish that were stocked to the Keahole Point site over the course of 2008; i.e. Velella will involve only 1.2% of the fish at Keahole Point during peak production. In addition, the Velella project will be located between 3 and 150 miles offshore, in waters over 12,000 ft deep, and constantly moving over the substrate. By contrast, the Keahole Point site is a mere ½ mile offshore from a pristine coral reef, located in waters around 200 ft deep, and is in a fixed position over the substrate. This all indicates that the Velella will have no measureable impact on water quality.

Under EPA regulations, an NPDES water quality monitoring plan is only required if a production facility exceeds 100,000 lbs production in one year. With only 6,000 fish grown to 4 lbs in size, the Velella will not even attain one quarter of the EPA threshold. It is therefore neither required, nor reasonable, to consider conducting any water quality monitoring around the Velella.

4. Marine mammal interaction monitoring and mitigation

The Kona Blue employees that will be staffing the Velella will record any sightings of marine mammals either from the surface, during dives to tend to the net pens, or while monitoring the underwater cameras on the array. Number, size, behavior and duration of residence around the array will be recorded. The staff will also note any other fish or birds around the tender vessel or the pens. The results from this monitoring will be made available to NOAA on request.

We expect no negative interaction with marine mammals, and therefore no mitigation is planned. The only negative marine mammal interaction at the Keahole Point farm site has been one bottle-nose dolphin that is regularly attracted to the pens – and several others that are rarely present – by the occasional provisioning by incidental escapes from the pens (as divers entered or left the cages through the submerged zippers). To reduce this provisioning, the offshore operation has installed net pen entry points on the newly-deployed Sea Station pen that are accessible by divers from above the surface, when the pen is raised. This has eliminated incidental escapes, and significantly reduced the provisioning of the dolphin. The Aquapod net pens that will be used in the Velella will similarly be equipped with hatches that allow entry by divers from above the water, when the pen is raised.

5. Contingency planning (storm events/gear loss)

As the Velella net pen array is usually submerged, storm events present no problem for the cages. The net pens will be submerged to around 25 ft deep – around the same depth as the net pens on the Keahole Point farm site. Storm conditions over the past 5 years at Keahole have not resulted in any significant damage to the pens. We therefore do not expect any damage to the Velella pen array.

The plan during storm conditions is for the tender vessel to lay an additional 600 ft of line out from the pens, and to use the pens as a sea anchor to control the vessel orientation and limit drift. Each of the pens will have attached sufficient residual buoyancy in the buoy float-lines to remain at the surface, even if the pens break free from the vessel, or become detached from each other. For a pen to be lost, then it would need to become detached from both its own surface float-line and from the rest of the array. The buoy float-line at the top of each pen will also include a GPS transmitter and radar reflector, so that if the pens do become detached from the vessel, they can be readily located as the storm abates, and reattached to the array.

6. Anticipated amount of escaped fish

We do not anticipate any escaped fish from the brass-mesh Aquapod net pens that will be used in the Velella trial. This mesh material is very robust (2.5 mm diameter UR30 alloy wire), and the cages will be submerged – isolated from wave action – for most of the time. The incidental

"leakage" escapes that have previously occurred at the Keahole Point site will be avoided in the Velella project by divers accessing the pen through the hatch at the top of the cage, which is emergent when the pen is raised.

If there is a catastrophic engineering failure, and the pen is breached, then the fish will likely behave in a similar manner to the escapees on the Keahole Point site: the escaped fish will remain close to the net pen, as this structure offers the only protection against predation. Blue water is a very dangerous environment for these relatively slow-swimming, deep water fish. The cage-cultured fish are also naïve to predators ("fat, slow, and stupid", as we call them), and will be subjected to very heavy predation by the larger pelagic fish that may aggregate around the cages. As the Velella will be located in very deep water, some 3 – 150 miles offshore, the probability of any of these escapees surviving to reach an island is negligible.

Even if the escapees did survive, and reach their natural habitat in the reef drop-off around the islands, these fish are progeny from locally-collected broodstock. There is no active selective program in the hatchery, and so there is little likelihood of any genetically significant difference between the escapees and the rest of the wild population.

The overall goal of this research.

We feel that it is perhaps valuable to note again the scale of this Velella project. The proposed project is a mere 6,000 fish: it is around 5% of the biomass of fish that is presently stocked into a single net pen at the Keahole Point farm site. This biomass is therefore insignificant, the feed amounts are relatively miniscule, and the potential ecological impacts are immeasurably small. We have deliberately designed this experiment and established this scale for the trial to be able to provide assurances to regulatory agencies and the public (once we publicize the project) that there are no possible negative impacts from this operation.

Certainly, if this project is successful and Velella moves forward towards commercial reality, some more detailed analysis of the cumulative and other impacts is fully warranted. At this stage, however, this is a very, very small scale experiment.

We are happy to assist you in the further review of this project. I am willing to travel to Honolulu to meet with Toby Wood or others to work through any additional questions, as you desire. Please let us know how else we might be of further assistance.

Thank you in anticipation.

Aloha, sincerely,

Neil Anthony Sims
Co-Founder; President; Co-CEO

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

DEC 2 1 2010

Mr. Neil A. Sims
Kona Blue Water Farms
P.O. Box 4239
Kailua-Kona, HI 96745-4239

Dear Mr. Sims:

NOAA Fisheries Service has received your application for a Special Coral Reef Ecosystem Fishing Permit to test the feasibility of deploying and operating two unmoored submersible, brass-meshed pens stocked with *Seriola rivoliana* in Federal waters off the Kona coast of the Island of Hawaii. We have determined that the application, which includes the additional information you provided, contains the required information needed for further review.

Sincerely,

Michael D. Tosatto
Regional Administrator

Appendix B: Title 50: Wildlife and Fisheries PART 665—FISHERIES IN THE WESTERN PACIFIC Subpart C—Hawaii Fisheries § 665.224 Permits and fees.

(a) *Applicability.* Unless otherwise specified in this subpart, §665.13 applies to Hawaii coral reef ecosystem permits.

(1) *Special permit.* Any person of the United States fishing for, taking or retaining Hawaii coral reef ecosystem MUS must have a special permit if they, or a vessel which they operate, is used to fish for any:

(i) Hawaii coral reef ecosystem MUS in low-use MPAs as defined in §665.199;

(ii) Hawaii Potentially Harvested Coral Reef Taxa in the coral reef ecosystem management area; or

(iii) Hawaii coral reef ecosystem MUS in the coral reef ecosystem management area with any gear not specifically allowed in this subpart.

(2) *Transshipment permit.* A receiving vessel must be registered for use with a transshipment permit if that vessel is used in the Hawaii coral reef ecosystem management area to land or transship PHCRT, or any Hawaii coral reef ecosystem MUS harvested within low-use MPAs.

(3) *Exceptions.* The following persons are not required to have a permit under this section:

(i) Any person issued a permit to fish under any FEP who incidentally catches Hawaii coral reef ecosystem MUS while fishing for bottomfish MUS, crustacean MUS, western Pacific pelagic MUS, precious coral, or seamount groundfish.

(ii) Any person fishing for Hawaii CHCRT outside of an MPA, who does not retain any incidentally caught Hawaii PHCRT; and

(iii) Any person collecting marine organisms for scientific research as described in §665.17, or §600.745 of this chapter.

(b) *Validity.* Each permit will be valid for fishing only in the fishery management area specified on the permit.

(c) *General requirements.* General requirements governing application information, issuance, fees, expiration, replacement, transfer, alteration, display, sanctions, and appeals for permits are contained in §665.13.

(d) *Special permit.* The Regional Administrator shall issue a special permit in accordance with the criteria and procedures specified in this section.

(1) *Application.* An applicant for a special or transshipment permit issued under this section must complete and submit to the Regional Administrator a Special Coral Reef Ecosystem Fishing Permit Application Form issued by NMFS. Information in the application form must include, but is not limited to a statement describing the objectives of the fishing activity for which a special permit is needed, including a general description of the expected disposition of the resources harvested under the permit (*i.e.*, stored live, fresh, frozen, preserved, sold for food, ornamental, research, or other use, and a description of the planned fishing operation, including location of fishing and gear operation, amount and species (directed and incidental) expected to be harvested and estimated habitat and protected species impacts).

(2) *Incomplete applications.* The Regional Administrator may request from an applicant additional information necessary to make the determinations required under this section. An applicant will be notified of an incomplete application within 10 working days of receipt of the application. An incomplete application will not be considered until corrected in writing.

(3) *Issuance.* (i) If an application contains all of the required information, the Regional Administrator will forward copies of the application within 30 days to the Council, the USCG, the fishery management agency of the affected state, and other interested parties who have identified themselves to the Council, and the USFWS.

(ii) Within 60 days following receipt of a complete application, the Regional Administrator will consult with the Council through its Executive Director, USFWS, and the Director of the affected state fishery management agency concerning the permit application and will receive their recommendations for approval or disapproval of the application based on:

(A) Information provided by the applicant;

(B) The current domestic annual harvesting and processing capacity of the directed and incidental species for which a special permit is being requested;

(C) The current status of resources to be harvested in relation to the overfishing definition in the FEP;

(D) Estimated ecosystem, habitat, and protected species impacts of the proposed activity; and

(E) Other biological and ecological information relevant to the proposal. The applicant will be provided with an opportunity to appear in support of the application.

(iii) Following a review of the Council's recommendation and supporting rationale, the Regional Administrator may:

(A) Concur with the Council's recommendation and, after finding that it is consistent with the goals and objectives of the FEP, the national standards, the Endangered Species Act, and other applicable laws, approve or deny a special permit; or

(B) Reject the Council's recommendation, in which case, written reasons will be provided by the Regional Administrator to the Council for the rejection.

(iv) If the Regional Administrator does not receive a recommendation from the Council within 60 days of Council receipt of the permit application, the Regional Administrator can make a determination of approval or denial independently.

(v) Within 30 working days after the consultation in paragraph (d)(3)(ii) of this section, or as soon as practicable thereafter, NMFS will notify the applicant in writing of the decision to grant or deny the special permit and, if denied, the reasons for the denial. Grounds for denial of a special permit include the following:

(A) The applicant has failed to disclose material information required, or has made false statements as to any material fact, in connection with his or her application.

(B) According to the best scientific information available, the directed or incidental catch in the season or location specified under the permit would detrimentally affect any coral reef resource or coral reef ecosystem in a significant way, including, but not limited to, issues related to spawning grounds or seasons, protected species interactions, EFH, and habitat areas of particular concern (HAPC).

(C) Issuance of the special permit would inequitably allocate fishing privileges among domestic fishermen or would have economic allocation as its sole purpose.

(D) The method or amount of harvest in the season and/or location stated on the permit is considered inappropriate based on previous human or natural impacts in the given area.

(E) NMFS has determined that the maximum number of permits for a given area in a given season has been reached and allocating additional permits in the same area would be detrimental to the resource.

(F) The activity proposed under the special permit would create a significant enforcement problem.

(vi) The Regional Administrator may attach conditions to the special permit, if it is granted, consistent with the management objectives of the FEP, including, but not limited to:

(A) The maximum amount of each resource that can be harvested and landed during the term of the special permit, including trip limits, where appropriate.

(B) The times and places where fishing may be conducted.

(C) The type, size, and amount of gear which may be used by each vessel operated under the special permit.

(D) Data reporting requirements. (E) Such other conditions as may be necessary to ensure compliance with the purposes of the special permit consistent with the objectives of the FEP.

(4) *Appeals of permit actions.* (i) Except as provided in subpart D of 15 CFR part 904, any applicant for a permit or a permit holder may appeal the granting, denial, conditioning, or suspension of their permit or a permit affecting their interests to the Regional Administrator. In order to be considered by the Regional Administrator, such appeal must be in writing, must state the action(s) appealed, and the reasons therefore, and must be submitted within 30 days of the original action(s) by the Regional Administrator. The appellant may request an informal hearing on the appeal.

(ii) Upon receipt of an appeal authorized by this section, the Regional Administrator will notify the permit applicant, or permit holder as appropriate, and will request such additional information in such form as will allow action upon the appeal. Upon receipt of sufficient information, the Regional Administrator will rule on the appeal in accordance with the permit eligibility criteria set forth in this section and the FEP, as appropriate, based on information relative to the application on file at NMFS and the Council and any additional information, the summary record kept of any hearing and the hearing officer's recommended decision, if any, and such other considerations as deemed appropriate. The Regional Administrator will notify all interested persons of the decision, and the reasons therefore, in writing, normally within 30 days of the receipt of sufficient information, unless additional time is needed for a hearing.

(iii) If a hearing is requested, or if the Regional Administrator determines that one is appropriate, the Regional Administrator may grant an informal hearing before a hearing officer designated for that purpose after first giving notice of the time, place, and subject matter of the hearing in the Federal Register. Such a hearing shall normally be held no later than 30 days following publication of the notice in the Federal Register, unless the hearing officer extends the time for reasons deemed equitable. The appellant, the applicant (if different), and, at the discretion of the hearing officer, other interested parties, may appear personally and/or be represented by counsel at the hearing and submit information and present arguments as determined appropriate by the hearing officer. Within 30 days of the last day of the hearing, the hearing officer shall recommend in writing a decision to the Regional Administrator.

(iv) The Regional Administrator may adopt the hearing officer's recommended decision, in whole or in part, or may reject or modify it. In any event, the Regional Administrator will notify interested persons of the decision, and the reason(s) therefore, in writing, within 30 days of receipt of the hearing officer's recommended decision. The Regional Administrator's action constitutes final action for the agency for the purposes of the Administrative Procedure Act.

(5) Any time limit prescribed in this section may be extended for good cause, for a period not to exceed 30 days, by the Regional Administrator, either upon his or her own motion or upon written request from the Council, appellant or applicant stating the reason(s) therefore.

Appendix C: NOAA Fisheries Service, PIRO Official Information Collection Forms

1. Special Permit/Low-use Marine Protected Areas Coral Reef Taxa Daily Catch Report Form
2. NMFS Transshipment Log for Coral Reef Ecosystem Management Unit Species Form
3. Marine Mammal Authorization Program Injury and Mortality Reporting Form

NOAA Fisheries Service
Pacific Islands Regional Office

OMB Control No. 0648-0462
Expiration Date: 08-31-2012

Special Permit/Low-use Marine Protected Areas
Coral Reef Taxa Daily Catch Report

Name of Licensee:_____ Coral Reef Ecosystem Permit No._____
Vessel Name:_____ Radio Call Sign:_____ Vessel Number:_____
Area Fished:_____ (follow regional fishing area designations)
Type of Gear Used (one report form for each haul with each gear type per day):_____
Date Gear Set: ___/___/___ Time at Start:_____ Units of Gear Set: _____
Date Gear Hauled: ___/___/___ Time at End: _____ Units of Gear Lost:_____
Wind Speed:_____ Wind Direction:_____ Sea Surface Temperature:_____ Average Depth:_____
Target Species (list all):_____
Observer on board?_____
If gear was lost, give explanation as to reason why (no penalty for lost gear)._____
_____
Describe any observed damage to the coral reef and how it occurred._____
_____

Species	No. Caught	Lbs. Caught	No. Kept	Lbs. Kept	If discarded, why	How processed?

Protected Species Observation

Enter Seal & Turtle numbers: identify other in appropriate box	Monk Seal	Turtle	Other
Observed in area			
Observed in vicinity of gear			
Interfering with fishing operations			
Preying on catch			
Entangled released alive			
Entangled released dead			

Print Name:_____ Signature:_____ Date: ___/___/___

Submit this form, as required by NMFS PIRO, to the address below:

National Marine Fisheries Service, Pacific Islands Region, Regional Administrator
1601 Kapiolani Boulevard, Suite 1100, Honolulu, HI 96814; (FAX): (808) 973-2941

NOAA Fisheries Service
Pacific Islands Regional Office

OMB Control No. 0648-0462
Expiration Date: 08-31-2012

NMFS Transshipment Log for Coral Reef Ecosystem Management Unit Species

Vessel:_____Permit No.:_____Date: ___/___/___
(Vessel receiving fish)

Broker or Shipping Agent:_____

Vessel:_____ Radio Call Sign:_____
(Vessel offloading fish) Permit Number:_____
Total number of days fished:_____ Type of Gear Used: _____
Average units of gear set per day:_____ Area of Catch:_____

Species	Number Received	Total Weight Received (Lbs.)

Print Name:_____ Signature:_____ Date:___/___/___
(Vessel captain / operator)

All required information must be recorded on the form within 24 hours after the day of transshipment.
Submit report to NMFS at the address below within 72 hours (3 days) following the transshipment of coral reef MUS:
National Marine Fisheries Service, Pacific Islands Region, Regional Administrator
1601 Kapiolani Boulevard, Suite 1100, Honolulu, HI 96814; (FAX): (808) 973-2941

MARINE MAMMAL AUTHORIZATION PROGRAM

MORTALITY/INJURY REPORTING FORM

National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910

PLEASE PRINT NEATLY AND IN CAPITAL LETTERS

1- LAST NAME OF VESSEL OWNER/OPERATOR

2- FIRST NAME OF VESSEL OWNER/OPERATOR

3-MI

4-MAILING ADDRESS

5- CITY

6- STATE

7- ZIP

8- VESSEL NAME

9- COAST GUARD DOC. NO. OR VESSEL STATE REG. NO.

10- STATE COMMERCIAL VESSEL NO.

11- FISHERY I.D. NO.

12- FISHERY GEAR TYPE AND TARGET SPECIES

13- DATE OF MORTALITY/INJURY (MM DD YYYY)

14- APPROXIMATE TIME OF MORTALITY/INJURY

AM/PM

15- LOCATION OF MORTALITY/INJURY

LATITUDE o '

LONGITUDE o '

16- TYPE OF INTERACTION (PLACE AN "X")

INCIDENTAL

INTENTIONAL

17- ENTER SPECIES CODE, TYPE OF MORTALITY/INJURY (SEE LIST OF CODES ON PREVIOUS PAGE), AND THE NUMBER OF EACH SPECIES INVOLVED. MAKE ONE ENTRY FOR EACH SPECIES INVOLVED IN THIS INCIDENT. YOU MAY MAKE UP TO THREE MORTALITY/INJURY CODES PER SPECIES.

SPECIES	MORTALITY/INJURY CODE			NUMBER

18- DESCRIPTION OF UNKNOWN SPECIES OR CIRCUMSTANCES OF MORTALITY/INJURY INCIDENT

OMB CONTROL NO. 0648-0292 (expires 11/30/2012)

MARINE MAMMAL AUTHORIZATION PROGRAM

MORTALITY/INJURY REPORTING FORM

National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910

INSTRUCTIONS FOR COMPLETING THE MORTALITY/INJURY REPORTING FORM

This reporting form is required ONLY WHEN there is an incidental mortality or injury to a marine mammal during commercial fishing activities. You are required to report the incidental mortality or injury within 48 hours after the end of the fishing trip (even if an observer is on board), or, for non-vessel fisheries, within 48 hours of an occurrence of an incidental mortality or injury. A separate report form is required for each fishery, for each date, and for each location.

PLEASE PRINT NEATLY AND IN CAPITAL LETTERS.

The reporting form should be detached from this instruction sheet, folded, and sealed prior to mailing. No postage is necessary for mailing. Forms may also be faxed to NMFS at (301) 713-4060. Questions regarding completion of this form, and requests for additional forms, may be directed to the NMFS Office of Protected Resources, 1315 East-West Hwy., Silver Spring, MD 20910-3226, (301) 713-2322.

MORTALITY/INJURY REPORT FIELD DEFINITIONS

1 - **LAST NAME:** Enter the last name of the vessel owner/operator or permit holder.
2 - **FIRST NAME:** Enter the first name of the vessel owner/operator or permit holder.
3 - **MI:** Enter the middle initial of the owner/operator of the vessel or permit holder.
4 - **ADDRESS:** Enter the street address or P.O. Box number of the vessel owner/operator or permit holder.
5 - **CITY:** Enter the city name of the vessel owner/operator or permit holder.
6 - **STATE:** Enter the 2-digit state code of the vessel owner/operator or permit holder.
7 - **ZIP:** Enter the zip code of the vessel owner/operator or permit holder.
8 - **VESSEL NAME:** Enter the name of the vessel as it is identified for commercial fishing operations. For non-vessel fisheries, leave this blank.
9 - **COAST GUARD DOCUMENT NO.:** Enter the vessel's Coast Guard Documentation number; OR Enter the **VESSEL'S STATE REGISTRATION NO.:** One of these numbers must be provided. For non-vessel fisheries, enter the state fishery permit number.
10 - **STATE COMMERCIAL VESSEL LICENSE NO.:** Enter the vessel's state commercial vessel license number, if applicable.
11 - **FISHERY IDENTIFICATION NO.:** (Category I or Category II fisheries) Enter the NMFS' fishery I.D. number (indicated on the vessel's MMAP authorization certificate) for the fishery in which this incident occurred. If the fishery ID number is unknown, or the vessel is not registered under the MMAP, fill in gear type and target species under item 12.
12 - **GEAR TYPE AND TARGET SPECIES:** (Category III fisheries) Enter the type of fishing gear used and the target species being fished when this incident occurred.
13 - **DATE OF MORTALITY/INJURY:** Enter the date the mortality/injury occurred. For example: November 1, 2009 is entered as 11/01/2009.
14 - **TIME OF MORTALITY/INJURY:** Enter the approximate time of day the mortality/injury occurred. Indicate AM if the mortality/injury occurred between midnight & noon, or PM if the mortality/injury occurred between noon and midnight.
15 - **LOCATION OF MORTALITY/INJURY LATITUDE & LONGITUDE:** Use standard entries in degrees and minutes.
16 - **TYPE OF INTERACTION:** Enter whether this incident was incidental or intentional.
17 - **SPECIES INCIDENTALLY KILLED OR INJURED:** Enter the species code and the mortality/injury code of the animal(s) involved. (Refer to the species and mortality/injury code lists included on page 2 of these instructions.) Enter the number of animals involved in each mortality/injury. You may enter up to three (3) injury codes per species. Make as many entries as apply to the date, time, and location entered in items 13-15.
18 - **DESCRIPTION OF UNKNOWN SPECIES:** If you have entered a species code for an unidentified species, please provide a detailed description of the animal involved, including color patterns, length, and body shape (drawings are helpful). State whether the animal involved was a cetacean (whale, dolphin, or porpoise), pinniped (seal or sea lion), walrus, manatee or sea otter. You may also use this space for other comments regarding this incident.

OMB Control No. 0648-0292 (expires 11/30/2012)

MARINE MAMMAL AUTHORIZATION PROGRAM

MORTALITY/INJURY REPORTING FORM

National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910

SPECIES AND STOCK CODES FOR MARINE MAMMALS

Pinnipeds (seals and sea lions)

100- Steller (northern) sea lion
101- California sea lion
105- Northern (Pribilof) fur seal
115- Harbor seal
116- Spotted seal
117- Ringed seal
121- Ribbon seal
124- Gray seal
127- Hawaiian monk seal
129- Northern elephant seal
130- Bearded seal
131- Harp seal
132- Hooded seal
203- Unidentified sea lion
204- Unidentified seal
205- Unidentified pinniped

Small Cetaceans (dolphins and porpoises)

047- Atlantic white-sided dolphin
049- Pacific white-sided dolphin
053- Common dolphin
054- Bottlenose dolphin
055- Grampus (Risso's) dolphin
058- Spotted dolphin
060- Spinner dolphin
061- Striped dolphin
063- Northern right whale dolphin
068- Harbor porpoise
072- Dall's porpoise
235- Unidentified small cetacean (porpoise or dolphin)

Large Cetaceans (toothed whales and baleen whales)

002- North Atlantic right whale
005- Gray whale
007- Fin whale
010- Minke whale
011- Humpback whale
012- Sperm whale
016- Beluga whale
038- False killer whale
039- Killer whale
221- Pilot whale
230- Beaked whale
231- Bryde's whale
232- Dwarf sperm whale
210- Unidentified baleen whale
220- Unidentified toothed whale

Other Marine Mammals

114- Walrus
135- Sea otter
139- Manatee

MORTALITY/INJURY CODES FOR MARINE MAMMALS

01 - Visible blood flow
02- Loss of/damage to appendage/jaw
03- Inability to use appendage(s)
04- Asymmetry in shape of body or body position
05- Any noticeable swelling or hemorrhage (bruising)
06- Laceration (deep cut)
07- Rupture or puncture of eyeball
08- Listlessness or inability to defend
09- Inability to swim or dive
10- Equilibrium imbalance
11- Ingestion of gear
12- Released trailing gear/gear perforating body
13- Other wound or injury
14- Killed

COLLECTION MANDATE

This collection of information is mandated by the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361 *et. seq.*), and by implementing regulations contained at 50 CFR 229.4. The information supplied on this form will be used by the National Marine Fisheries Service to estimate levels of incidental mortalities and injuries in U.S. commercial fisheries. Certain information supplied on this form may be considered proprietary and therefore subject to data confidentiality restrictions of 50 CFR Part 229.11.

Public reporting burden for this collection of information is estimated to average 0.15 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Director, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Hwy., Silver Spring, MD 20910-3226.

The National Marine Fisheries Service may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a current and valid OMB control number. The OMB control number for this form is 0648-0292, which expires on 11/30/2012.

OMB Control No. 0648-0292 (expires 11/30/2012)

Appendix D: Project Contingency Plans

1. Velella Project Emergency Reporting Plan
2. Marine Protected Species Monitoring and Reporting Plan

D1)

VELELLA PROJECT EMERGENCY REPORTING PLAN

1. The NOAA designated contact point shall be notified immediately if any of the following occur:

a. Failure of any major component of the tow or tether system
b. Damage (either willful or unintentional) to array materials or equipment by any third party, or any physical contact between the array and any third party
c. Escape of any fish from the net pen
d. Mass mortality of fish in the net pen

Any interaction with marine mammals will be reported in accordance with the Marine Mammal Monitoring Plan (State Mitigation) and/or the Marine Mammal Protection Act (Federal Requirement).

2. The array shall be monitored on a continual basis. When weather or surf conditions do not permit the tender to remain tethered to the array, the tender shall stand off and maintain contact by visual or remote telemetry methods. The tender shall ensure that the array does not come in contact with any corals or other sensitive habitats, and remains outside of State waters, and clear of any reefs. In effect, the tender vessel will exercise the same responsibility for due care as if the array were a vessel under tow by the tender.

3. The USCG shall be notified immediately if any maritime incident occurs that may represent a risk to life or property.

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D2)

In addition to reporting requirements of the Marine Mammal Protection Act as discussed in section 2.2.4 of the EA, the following was provided by the applicant to demonstrate compliance with existing aquaculture operations and marine mammal mitigation procedures within State waters:

KONA BLUE WATER FARM'S STATE OF HAWAII
MARINE PROTECTED SPECIES MONITORING AND REPORTING PLAN

The goal of the Marine Protected Species Monitoring and Reporting Plan is to ensure that there is no significant negative interaction between marine protected species and the farm operations.

Reporting

A designated representative of the permittee shall:

Report immediately to NOAA Fisheries (1-888-256-9840) and DAR (808-587-0106):

1. Any observed or reported direct physical contact by any marine mammal or sea turtle with any part of the pen, cage or moorings.

2. Any observed or reported injured or entangled marine mammal or sea turtle within 100 meters of any part of the pen, cage or moorings.

Report within one week to DAR (808-587-0106) any observed approach less than 10 meters by any marine protected species to any part of the cage or moorings.

All reports should include the following information:

1. Name of observer (and reporter, if not reported by observer)
2. Date and time of report
3. Date and time of incident
4. Contact number of observer (and reporter, if not reported by observer)
5. Marine protected species identification if possible
6. Brief incident description

Monitoring

A shore-based humpback whale monitoring program will be developed and initially implemented by DAR-HIHWNMS staff using equipment and field support provided by the permitee. The project will compare whale behaviors and abundances observed at the project site to those observed at a nearby control site having similar biophysical characteristics. The project will be designed to detect gross changes in abundance and/or behavior over time at the project site relative to those observed at the control site. The monitoring methodology will be tested, finalized and implemented by DAR-HIHWNMS staff during the winter-spring 2005 humpback whale season. The permitee will provide staff and/or funds to continue the project during subsequent humpback whale seasons, unless otherwise notified by DAR-HIHWNMS. The total level of effort required to implement the monitoring program in subsequent humpback whale seasons is expected to be approximately 20 hrs per month for a five-month period (December through April).

Activity Modification

Pursuant to CDUP HA-3118 (August 19, 2003), condition no. 24, in the event any instance of significant adverse impact on marine protected species, e.g., collision, entanglement, injury, etc., is observed to be associated with the project, DAR will coordinate a consultation as soon as possible between the permitee and marine protected species experts to determine the most appropriate course of action. After the consultation, DAR staff will coordinate with OCCL to make recommendations as necessary to the BLNR for consideration and approval. As stated in the CDUP condition no. 24, activity modifications may range from increased monitoring to immediate project shutdown and removal of the entire structure, depending on the severity of the impact and its likelihood of reoccurrence.

PROJECT ACTIVITY MODIFICATION PROTOCOL

These provisions, originally Section 24 of CDUP HA-3118, are now incorporated in full into the Marine Protected Species Reporting and Monitoring Plan.

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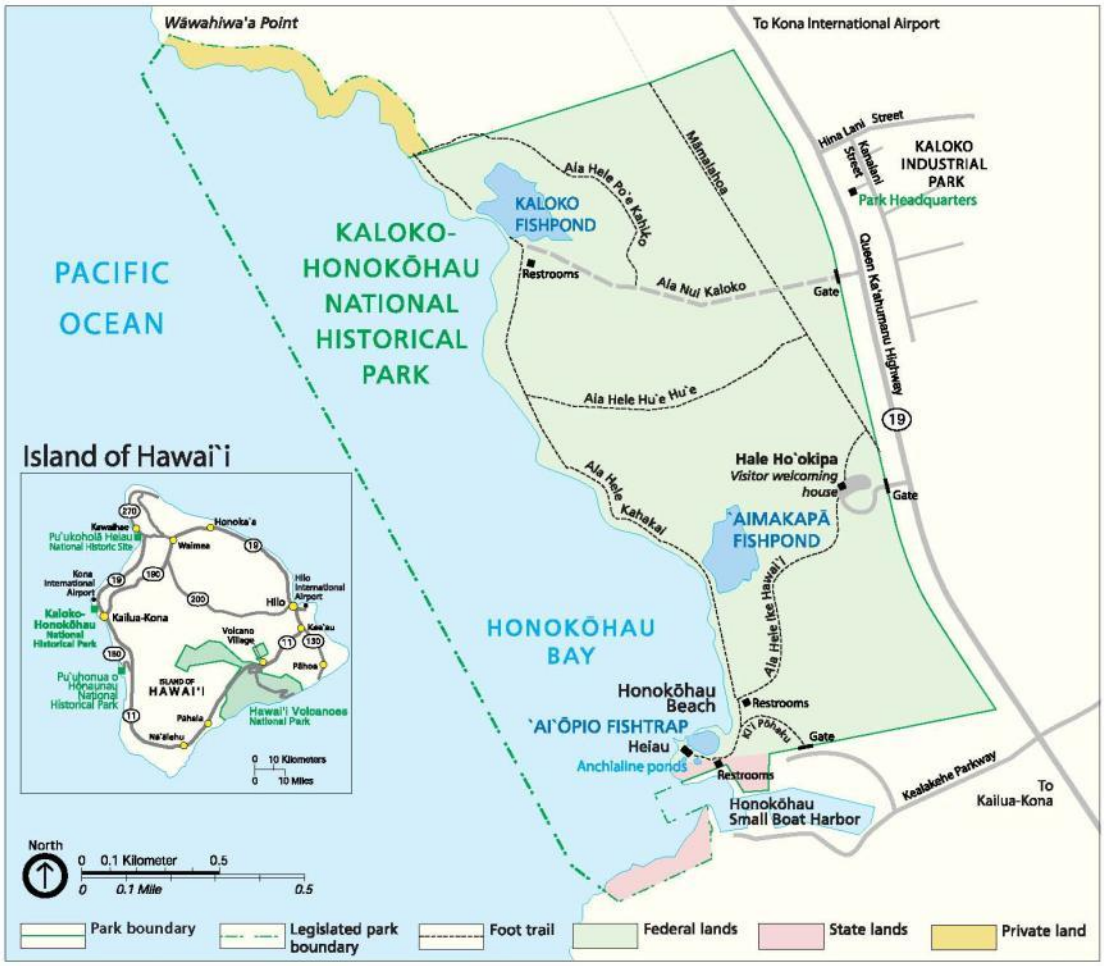
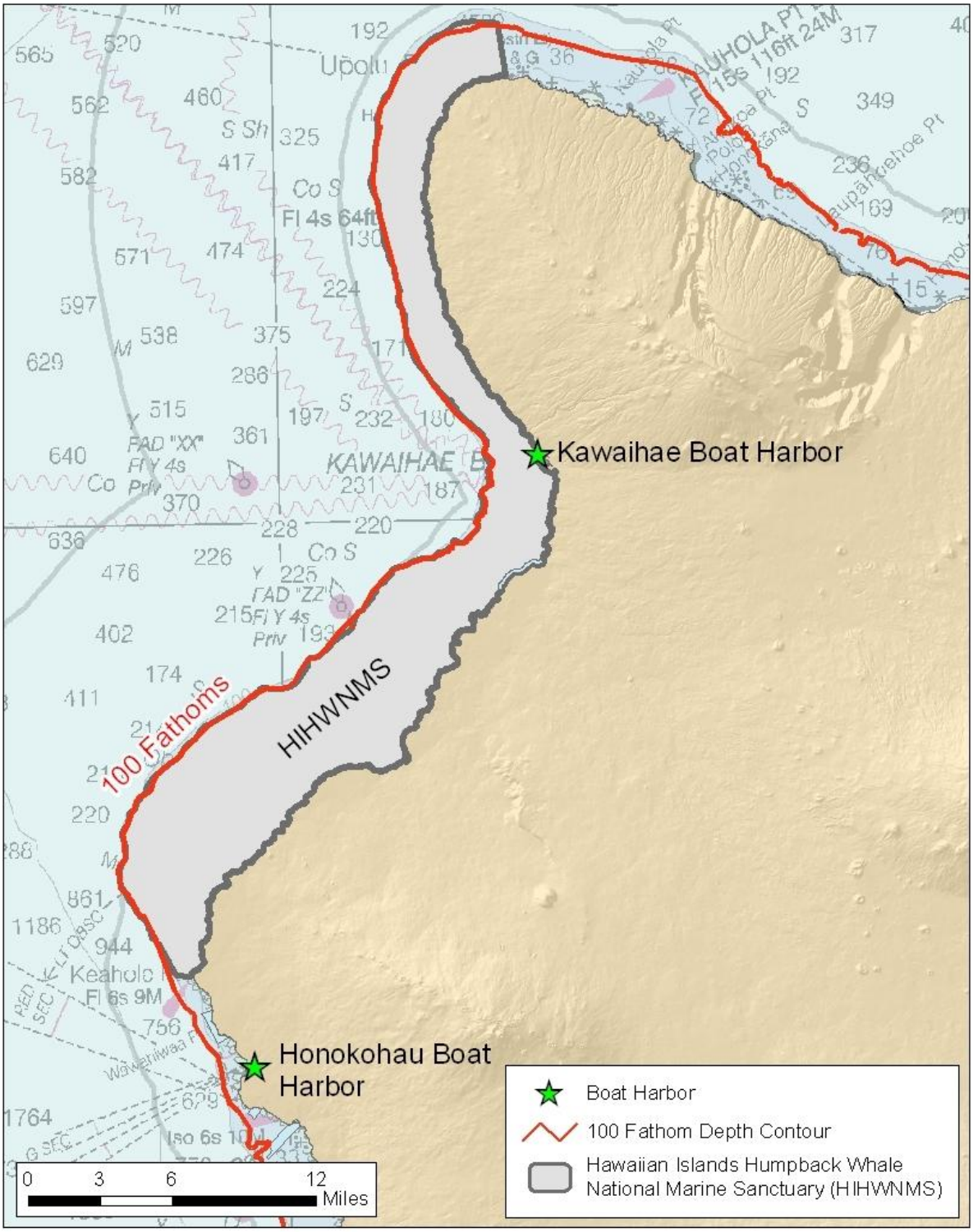
Appendix E. Map of Kaloko-Honokohau National Historical Park.



Source: National Park Service, http://www.nps.gov/kaho/planyourvisit/maps.htm

Appendix F. Map of Hawaiian Islands Humpback Whale National Marine Sanctuary boundary in relation to Kawaihae and Honokohau Boat Harbors.



Map by: R. O'Conner 06/17/2011
Data Sources: State of Hawaii and NOAA Office of Coast Survey. Depth soundings in fathoms.