



REGION 4
ATLANTA, GA 30303

November 20, 2024

Mr. David Bernhart
Assistant Regional Administrator for Protected Resources
National Marine Fisheries Service
Southeast Regional Office
St. Petersburg, Florida

Re: Request for Reinitiation of Expedited Informal Consultation under Endangered Species Act Section 7(a)(2) and Fish and Wildlife Coordination Act for modifications to Ocean Era's marine aquaculture facility (Velella Epsilon)

Dear Mr. Bernhart:

The U.S. Environmental Protection Agency Region 4 (EPA) issued a National Pollutant Discharge Elimination System (NPDES) permit in 2022 for Ocean Era's small-scale marine aquaculture facility (the 2022 Permit). The 2022 permit was subject to Endangered Species Act (ESA) Section 7 informal consultation with the National Marine Fisheries Service (NMFS). EPA is now considering a modified NPDES permit to reflect revised operations by Ocean Era. EPA has identified new information that may not have been previously considered in NMFS's written concurrence for the 2022 permit. EPA is acting as lead agency for the two other federal actions associated with the proposed project (U.S. Army Corps of Engineers (USACE) action under a Rivers and Harbor Act (RHA) Section 10 permit and the National Oceanic and Atmospheric Administration (NOAA) Sea Grant action of providing federal funding to Ocean Era).

On behalf of the USACE and NOAA Sea Grant, EPA requests reinitiation of the Fish and Wildlife Coordination Act (FWCA) consultation and ESA Section 7 consultation in accordance with the expedited informal provisions (ESA Section 7(a)(2)). Pursuant to our request for expedited informal consultation, the enclosures provide information about the ESA Section 7 consultation conducted for the 2022 permit; new information that is available due to Ocean Era making modifications to the facility; a description of the action and action area to be considered; a description of any listed species or critical habitat that may be affected by the action; and an analysis of the potential routes of effect on any listed species or critical habitat.

Based on the analysis presented in the enclosures, EPA has determined that the modifications to the proposed activity are "not likely to adversely affect" some species and critical habitats, and have "no effect" for other species or critical habitats that are relevant to the proposed action under ESA in the action area. EPA has used the best scientific and commercial data available to complete this analysis. EPA also requests NMFS provide written concurrence with our determinations under ESA Section 7 and FWCA.

Sincerely,

Kip M. Tyler, Senior Permitting Specialist
NPDES Permitting Section

cc: Mr. John Fellows, USACE (via email)
Mr. Mark Rath, NOAA Sea Grant (via email)

Enclosures:

1. Supporting Information and Analysis of Effects under ESA Section 7 and FWCA for the Draft Modified NPDES Permit, RHA Section 10 Permit, and NOAA's Sea Grant Action
2. Final Biological Evaluation for the 2022 NPDES permit dated September 30, 2020
3. NMFS response letter to the 2022 permit's ESA consultation dated September 30, 2019
4. Additional analysis conducted by NMFS after the 2022 NPDES permit was issued dated August 26, 2022

Enclosure 1 - Supporting Information and Analysis of Effects under ESA Section 7 and FWCA for the Draft Modified NPDES Permit, RHA Section 10 Permit, and NOAA's Sea Grant Action

Federal Coordination and Lead Agency Determination

The implementing regulations for ESA consultations allow a lead agency when the proposed action involves more than one federal agency.¹ The usage of a lead federal agencies during environmental reviews promotes efficiency and consistency. The FWCA does not require or suggest a lead agency for consultations involving multiple agencies for the same action.

The 2022 NPDES Permit

Given that the action of authorizing the proposed project involved more than one federal agency (NPDES permit issuance by EPA, and Rivers and Harbors Act (RHA) Section 10 permit issuance by the US Army Corps of Engineers (USACE)), the EPA elected to act as the lead agency to complete the NEPA review as well as the action agencies' ESA and Essential Fish Habitat (EFH) consultation responsibilities. EPA's decision to act as the lead agency was also informed by the 2017 Memorandum of Understanding for Permitting Offshore Aquaculture Activities in Federal Waters of the Gulf of Mexico that was effective during the 2022 NPDES permit issuance for seven federal agencies with permitting or authorization responsibilities. EPA notified the National Marine Fisheries Service (NMFS) that EPA is acting as the lead agency. NMFS and USACE were cooperating or co-federal agencies for these environmental reviews.

Proposed NPDES Permit Modification

The modified NPDES permit remains subject to multiple federal actions, therefore, the EPA elected to maintain the lead federal agency roles for NEPA, ESA, and EFH.² On November 2, 2023, NMFS and USACE were informed by EPA that it will serve as the lead agency for any subsequent EA revisions or analysis, if necessary, due to proposed project modifications requested by Ocean Era, and requested that NMFS and USACE become a cooperating agency for NEPA if additional analysis is needed to evaluate potential effects with the proposed modification. These letters also notified the NMFS and USACE that EPA will maintain the lead agency role for ESA and EFH if re-initiating the consultations are required. On November 3, 2023, NMFS and USACE accepted EPA's lead role for NEPA, ESA, and EFH while also acknowledging that they will operate as cooperating agencies under NEPA. ESA Section 7 consultation for the modified action also includes NOAA's Sea Grant action for funding the project in partnership with Ocean Era, University of Florida, and University of Miami.

Supporting Information

Interagency consultation and coordination with the NMFS and the US Fish and Wildlife Service (USFWS) is required by ESA Section 7 to insure that any action authorized, funded, or carried out by an action agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any designated critical habitat (ESA Section 7(a)(2)), and confer with the NMFS and USFWS on any agency actions that are likely to jeopardize the continued existence of any species that is proposed for listing or result in the destruction or adverse modification of any critical habitat proposed to be designated (ESA Section 7(a)(4)). Additionally, the implementing regulations for the CWA related to the ESA require EPA to ensure, in

¹ 50 CFR § 402.07 allows a lead agency: "When a particular action involves more than one Federal agency, the consultation and conference responsibilities may be fulfilled through a lead agency. Factors relevant in determining an appropriate lead agency include the time sequence in which the agencies would become involved, the magnitude of their respective involvement, and their relative expertise with respect to the environmental effects of the action. The Director shall be notified of the designation in writing by the lead agency."

² The NPDES permit at issue is exempt from NEPA requirements, but EPA elected to voluntarily prepare an environmental assessment of impacts and alternatives in accordance with its Policy for Voluntary Preparation of NEPA Documents, 63 FR 58045 (Oct. 29, 1998).

consultation with the NMFS and USFWS, that “any action authorized by EPA is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat.”³

The 2022 NPDES Permit

A biological evaluation (BE) was prepared by EPA and USACE to jointly consider the potential direct, indirect, and cumulative effects that the proposed actions may have on listed and proposed species as well as designated and proposed critical habitat, and to assist the action agencies in carrying out their activities for the proposed action pursuant to ESA Section 7(a)(2) and ESA Section 7(a)(4). EPA and USACE reviewed the proposed activity and determined that a BE was appropriate to evaluate the scope of the proposed project. The action agencies considered the potential effects to threatened and endangered species from five groups of species: birds, fish, invertebrates, marine mammals, and reptiles. EPA and USACE concluded that the proposed project’s potential threats (disturbance, entanglement, vessel strike, water quality) to ESA-listed species and critical habitat are highly unlikely to occur or extremely minor in severity; therefore, the potential effects to ESA protected species and critical habitats are discountable or insignificant.

On August 13, 2019, EPA and USACE provided the jointly developed BE to NMFS and initiated consultation with the NMFS. Regarding federally listed species, proposed species, and critical habitat under the jurisdiction of NMFS, EPA and USACE determined that the discharges authorized by the NPDES permit “may affect, but [are] not likely to adversely affect” certain fish, invertebrates, marine mammals, and reptiles within the proposed action area. On September 30, 2019, NMFS concurred with some of the “not likely to adversely affect” determinations made by the federal action agencies, and revised others to “no effect.”

Additional Analysis Conducted by NMFS After the 2022 NPDES Permit was Issued

Following the final NPDES permit issuance in 2022, NMFS issued a letter of concurrence (LOC) that amended the consultation record to add a late-arriving action agency and to include additional relevant information related to the project’s potential impacts. The LOC did not change NMFS’s determination that the Ocean Era project is not likely to adversely affect any listed or proposed species or designated or proposed critical habitat. The LOC included an additional analysis on 1) the project-related vessel route between the marina and farm location; 2) potential route of effects to species from vessel strikes associated with the project and from non-project vessels due to a potential increase in recreational or commercial traffic near the facility; 3) potential effects of the aquaculture facility acting as a fish aggregating device that could lead to behavioral changes, increased predation, and increased bycatch; and 4) the potential risk of harmful algal blooms (HAB) from the project on listed species. Because all potential project effects to listed species were found to be extremely unlikely to occur, NMFS reaffirmed its concurrence with the EPA and USACE assessment that the proposed action is not likely to adversely affect any listed species or designated critical habitat.

Summary of Proposed Changes to the Facility

Ocean Era has indicated that it will not proceed with its aquaculture project as currently permitted in the 2022 permit because it intends to make changes to certain aspects of the operation. Specifically, Ocean Era has requested to alter: 1) the species of fish to be cultured (from albacore jack to red drum); 2) net material (copper to monofilament); and 3) the type of rearing system (from swivel point mooring system to a stationary cage attached

³ 40 CFR § 122.49: The following is a list of Federal laws that may apply to the issuance of permits under these rules. When any of these laws is applicable, its procedures must be followed. When the applicable law requires consideration or adoption of particular permit conditions or requires the denial of a permit, those requirements also must be followed. ... (c) The Endangered Species Act, 16 U.S.C. 1531 et seq. section 7 of the Act and implementing regulations (50 CFR part 402) require the Regional Administrator to ensure, in consultation with the Secretary of the Interior or Commerce, that any action authorized by EPA is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat.

to a grid mooring system). Other operational changes related to the discharge include a decreased fish production amount and lower nutrient load. More details for the proposed facility changes are provided below with a comparison to the currently permitted project (also see Tables 1 and 2).

- **Fish Species:** Ocean Era will raise red drum (*Sciaenops ocellatus*) rather than almaco jack (*Seriola rivoliana*). Both fish species are native to the Gulf of Mexico. The red drum brood stock will be sourced from wild fish caught in the Gulf of Mexico in the Sarasota region. Ocean Era will obtain juvenile red drum from first generation offspring of wild fish that are produced and raised at Mote Aquaculture Park, University of Miami, or Live Advantage Bait, LLC.
- **Fish Quantity:** The 2022 permit application states that 20,000 almaco jack fingerlings would be initially stocked into the cage and an estimated 17,000 fish would be harvested. Ocean Era's modification shows that 20,000 red drum fingerlings would be stocked into the cage and approximately 17,000 fish would be harvested within approximately 12 months assuming an 85% survival rate. No appreciable changes to the number of fish produced is anticipated by Ocean Era.
- **Survival Rate:** Ocean Era estimates that the survival rate (85%) for red drum will be the same as almaco jack.
- **Fish Size and Production:** The maximum production amount (without accounting for mortality) for the 2022 permit and modified permit is 88,000 lbs and 55,000 lbs, respectively. Red drum grow slower than almaco jack; therefore, the red drum harvest size will be approximately 2.75 lbs rather than 4.4 lbs for almaco jack. When accounting for the 15% mortality rate, the red drum's smaller harvestable size equates to a total estimated harvest of 46,750 lbs vs. the currently estimated harvest of 74,800 lbs, or approximately 63% of the currently estimated fish production.
- **Fish Feed:** Red drum require a different feed than almaco jack that is lower in protein and nutrients. The previous feed proposed by Ocean Era for almaco jack was EWOS Marine Juvenile (juvenile fish) and Skretting Kona Pacific (adult fish). See table 1 for certain feed characteristics. For the modified permit, Ocean Era will use Cargill Aquacell Starter 5014 (juvenile) and Cargill Triton 4413 redfish feed (adult).
- **Feed Rate:** The daily feed rate for almaco jack and red drum are approximately the same. The estimated feed rate is approximately 1% of fish body weight per day. Due to the slower growth rate and smaller harvest size, the total amount of feed used during production for the modified permit application would be approximately 49,000 lbs less than the feed amount for the 2022 permit.
- **Fish Density:** The fish density at harvest for the currently permitted and modified permit are approximately 1.3 and 1.0, respectively. The stocking density will remain at a commercial scale aquaculture density.
- **Cage Design:** Ocean Era reported that minor changes to the submersible net pen design are anticipated. The permitted net pen and the proposed cage are based on a PolarCirkel-style submersible design. The diameter of the 2022 permitted and proposed cage is 17 m and 25.5 m, respectively. The total fish rearing volume will be maintained at approximately 56,504 ft³.
- **Cage Net Material:** The permitted net mesh material was CopperNet that uses copper alloy wire woven into chain-link fence mesh. The proposed net material is KikkoNet – a black colored, UV stabilized, and lightweight polyethylene terephthalate monofilament that is woven into a hexagonal mesh. Ocean Era reported that there is no functional difference between the two cage materials in terms of entanglement risk or other concerns. The monofilament and copper cage material have the same opening size of 40 mm. The diameter of the Kikkonet and copper net are 2.8 mm and 4 mm, respectively.
- **Mooring System:** Mooring design for the proposed cage uses eight embedment anchors compared to the permitted mooring design of three embedment anchors. The mooring design for the proposed cage also uses four ballast blocks that touch the sea floor as part of the anchoring system (which were not part of

the embedment design for the 2022 permit). The estimated size of the concrete ballast blocks is 1.7 m³ and weigh 1,750 kg.

- **Mooring Lines:** Mooring lines will be used at multiple locations. The proposed configuration uses rope or chain to create the grid system, attach anchors to the grid system, connect ballast blocks to the grid system, and connect the grid system to the cage. Additionally, there are lines that connect from the anchor system to small buoys at the water surface to mark the location of anchors and show the grid boundary. Overall, the lines used for the proposed stationary cage system result in increased length of at least 4,750 ft. All ropes and lines are 2 inches in diameter.
- **Operational footprint:** When accounting for the mooring system, lines, and anchorages, the currently permitted swivel mooring produced a project footprint of approximately 11 acres. The proposed stationary grid system boundary area is approximately 23 acres.
- **Location and Water Depth:** No changes are proposed for the facility location and water depth. The proposed project would be placed in the Gulf at an approximate water depth of 130 ft, generally located 45 miles southwest of Sarasota, Florida.
- **Drugs:** Ocean Era is not proposing any changes to the drugs or therapeutants used during fish production. As currently permitted, Ocean Era does not intend to use therapeutants for the modified action, but use of therapeutants is authorized. Ocean Era reports that red drum are better suited to a stationary net pen and less likely to need therapeutants to control pathogens due to being naturally more tolerant to skin flukes.
- **Other:** Ocean Era did not report any other revisions to the modified operations.

Table 1 - Summary of Project Information

Item	Current NPDES Permit	Modified NPDES Permit
Fish Species	Almaco jack (<i>S. rivoliana</i>)	Red drum (<i>S. ocellatus</i>)
Fish Quantity		
@ stocking	20,000	20,000
@ harvest	17,000	17,000
Total Fish Production (lbs)		
Maximum (lbs)	88,000	55,000
Survival Rate (%)	85%	85%
Estimated (lbs)	74,800	46,750
Harvest Fish Size (lbs)	4.4	2.75
Harvest Fish Density (lbs/ft ³)	1.3	1.0
Fish Feed (juvenile)		
Manufacturer and Name	EWOS Marine Juvenile	Cargill Aquaxcel Starter 5014
Feed Rate (% fish body wt)	~1%	~1%
Protein (%)	50	50
Phosphorus (%)	1.4	1.0
Nitrogen (%)	8.0	8.0
Fish Feed (Adult)		
Manufacturer and type	Skreeting Kona Pacific	Cargill Triton 4413
Feed Rate (% fish body wt)	~1%	~1%
Protein (%)	41	44
Phosphorus (%)	1.2	1.0
Nitrogen (%)	6.56	7.04
Total Estimated Load @ Max Production		
Total Feed Amount (lbs)	175,320	126,210
Phosphorus (lbs)	2,104	1,262
Nitrogen (lbs)	14,026	10,097
Solids (lbs)	61,345	44,161
Total Ammonia Nitrogen (lbs)	6,899	5,330
Cage Information		
Cage Type	PolarCirkel-style	PolarCirkel-style
Mooring Type	swivel	stationary
Rearing Volume (ft ³)	56,504	56,504
Diameter (ft)	56	84
Net material	copper	monofilament
Operational Footprint (acres)	11	23

Table 2 - Summary of Mooring System

Item	Current Permit		Modified Permit		Difference	
	Qty	Length (ft)	Qty	Length (ft)	Qty	Length (ft)
Embedment anchors	3	-	8	-	+5	-
Concrete nodes	-	-	4	-	+4	-
Mooring chain/line	3	787	8	3,306	+5	+2,519
Mooring rope	3	394	-	-	-3	-394
Bridle lines	3	295	8	1,128	+5	+833
Node block to buoy	-	-	4	328	+4	+328
Grid line	-	-	4	787	+4	+787
Anchor to buoy line	-	-	8	656	+8	+656
Total	12	1,476	44	6,205	35	+5,123

Revisions to the Draft Modified NPDES Permit

All conditions of the 2022 permit and the draft modified permit remain the same except for the following revisions to the draft modified permit:

1. the maximum fish production level has been reduced from 88,000 lbs to 55,000 lbs on the cover page of the draft modified Permit and in Part II.B.14;
2. the cultured fish species (red drum) has been included in Part II.A of the draft modified Permit;
3. considering Ocean Era's decision to use a material other than copper for the net pen, effluent monitoring for total copper has been removed from Table 1 of draft modified Permit Part II.A.1; and
4. a prohibition on the intentional or negligent release of produced fish is included as a clarification in the draft modified Permit Part II.B.15.

Conservation Measures and Best Management Practices

A best management practices (BMPs) plan is required to be developed and implemented by the NPDES permit for the following topics: feed management; waste collection and disposal; transport of harvest discharge; carcass removal; material storage; maintenance; recordkeeping; and training (see draft modified NPDES permit for details). The NPDES permit also requires Ocean Era to implement other practices that are related to protecting ESA-listed species such as the environmental monitoring plan and a facility damage prevention and control plan. Ocean Era must implement these comprehensive plans to meet the permit conditions that are unique to their operation.

Ocean Era will use a protected species monitoring plan (PSMP) that was created in coordination with NMFS to protect and monitor for any protected species, and collect data on potential interactions between aquaculture facilities and protected species. The PSMP will be updated by Ocean Era in coordination with NMFS to include the project modifications. All conservation measures included in the 2022 permit action, including the SERO Protected Species Construction Conditions and Vessel Strike Mitigation Measures,⁴ will be implemented for the modified project.

Description of the Action Area

The *action area* is all areas to be affected by the Federal action and not merely the immediate area involved in the action. *Effects of the action* are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action. The action area is distinct from and can be larger than the project footprint because some elements of the project may affect listed species or critical habitat some distance from the project footprint. The action area, therefore, extends out to a point where no effects from the project are expected to occur.

For the modified project, the action area identified for the 2022 permit was a 1,000-meter radius measured from the facility center. The BE described the surrounding conditions, habitats, uses dominating the action area, general site conditions, water depth, substrate type, presence of any submerged aquatic vegetation, hard bottoms, etc. The 2022 action area remains unchanged for the draft modified NPDES permit. Additionally, NMFS 2022 LOC redefined and expanded the action area to include any vessel route to and from the facility in the Gulf of Mexico.

⁴ NMFS conservation measures are available at: www.fisheries.noaa.gov/southeast/consultations/regulations-policies-and-guidance

Analysis of Effects Not Previously Considered for the Federal Permitting Actions

According to 50 CFR 402.16, a federal agency is required to reinitiate ESA Section 7 consultation if any one of four thresholds are triggered.⁵ EPA, as the lead agency, has evaluated the triggers as described below and assessed the effects of the modified permitting action that were not previously considered under the 2022 permit:

1. If the amount or extent of taking specified in the incidental take statement is exceeded. (50 CFR 402.16(a)(1))

Incidental take refers to takings of ESA species that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant. The proposed project is not subject to an incidental take statement, and no incidental take is expected or allowed. ESA consultation reinitiation is not required based on this trigger.

2. If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered. (50 CFR 402.16(a)(2))

EPA and USACE evaluated the potential impacts to listed species and critical habitat in the 2020 BE. The risks to ESA-listed species and critical habitat that were considered during the 2022 permit were water quality, disturbance, vessel strike, and entanglement. The additional analysis conducted by NMFS in 2022 further considered potential impacts relating to HABs, fish aggregation devices, and vessel strikes. The routes of effects and potential impacts to listed species and critical habitat for the modified action are presented below.

Effects to Listed Species

Water Quality

All potential water quality risks associated with the modified permit are less when compared to the 2022 permit due to the change in fish species, decreased fish production amount, lower total feed, and reduced phosphorus and nitrogen feed contents. As shown in Table 1, the total load for nitrogen, phosphorus, and total ammonia nitrogen have decreased by 28%, 40%, 23%, respectively. EPA does not anticipate that the modified project's discharge will contribute to HABs due to the offshore location and small scale of the facility; however, any HAB effects from the project are mitigated by the reduced scale of pollutants compared to pollutants that were already evaluated in the 2022 permit record.

Ocean Era indicated that the netting material would need more regular cleaning unlike the previous cage material proposed. More frequent cleanings may temporarily increase floating biosolids or turbidity in the water surrounding the cage for a short duration directly after the cage cleaning. Because the listed species in the action area are highly mobile, and the time of increased turbidity in the water column will be very short, the effects of cage cleaning will be insignificant. The net material allows for more efficient cleaning that allows an increased cleaning frequency which can further control biofouling.

⁵ 50 CFR 402.16: Reinitiation of consultation: (a) Reinitiation of consultation is required and shall be requested by the Federal agency, where discretionary Federal involvement or control over the action has been retained or is authorized by law and: (1) If the amount or extent of taking specified in the incidental take statement is exceeded; (2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) If a new species is listed or critical habitat designated that may be affected by the identified action.

The revised fish species (red drum) is native to the Gulf of Mexico that has historically supported commercial and recreational fisheries. Similar to the fish species that were evaluated during the 2022 permit issuance (kampachi), red drum will be the first-generation offspring of wild-caught red drum in the vicinity of the facility. NPDES permit conditions limiting fish escapes have been further clarified by the draft modified permit's express condition prohibiting the intentional or negligent release of cultured fish.

Other biological materials such as pathogens that are considered pollutants under the NPDES program were previously assessed. The draft modified permit maintains conditions to reduce the probability of fish contracting diseases and limit pathogen transfer such as a veterinarian certificate attesting to fish health, and best management practices to prevent and minimize the indirect transfer or discharge of aquaculture pathogens. Ocean Era reports that red drum are more tolerant to skin flukes than almaco jack and will be better suited for a stationary culture system. Additionally, the netting is a smooth non-fibrous material that minimizes the development of biofouling marine benthic fauna on its surface. By limiting the amount of biofouling on the cage, the cultured fish receive increased water flow that maintains water quality levels that are optimal for fish health. The promotion of disease prevention practices within the cage decreases the transfer risk of pathogens or diseases to native fish outside of the culture system.

The usage of certain drugs or therapeutants is allowed for freshwater and marine aquaculture under the NPDES program, and under the 2022 permit and draft modified permit. The draft modified NPDES permit contains monitoring and reporting provisions for all drugs and chemicals used because Ocean Era previously identified three drugs as potential candidates (hydrogen peroxide, oxytetracycline dihydrate, and florfenicol) should the need for drug usage arise. Drug treatment usage is mitigated or minimized by the strong open ocean currents that will constantly flush the fish culture area, the properties of the net mesh material that minimizes biofouling, and the lack of nearby aquaculture facilities that increase the risk of disease and pathogen transmission. Additionally, the operational practices mentioned previously regarding pathogen control (e.g., regular maintenance and cleaning of the cage, monitoring effluent water quality, fish health monitoring) help minimize therapeutant usage.

Vessel Strike and Disturbance

Ocean Era is not proposing more vessels or more trips to the facility for the modified action. Vessel traffic from boats not associated with Ocean Era are estimated to be similar to that previously evaluated. Ocean Era has also not reported any operational changes that bear on the previous analysis conducted for disturbance to ESA-listed species. EPA has determined that the exposure routes associated with vessel strikes and disturbance will be the same as evaluated in the 2019 BE, the NMFS 2022 LOC, and the 2022 permit record. Therefore, effects due to vessel strike and disturbance from the project modifications are extremely unlikely to occur.

Fish Aggregation

There are potential risks to ESA-listed species from the proposed project acting as a fish aggregating device. As discussed above, the proposed project modification changes the cage net material from copper alloy mesh to Kikkomesh. Copper alloy mesh has increased anti-biofouling properties over monofilament; however, KikkoNet is known to foul less than other fiber-based monofilament due to

its rigidity and smooth material.⁶ KikkoNet may have increased risk of biofouling than the original copper alloy mesh net material. Due to increased biofouling that may occur, fishes and sea turtles may be attracted to the cage to feed on biofouling algae and crustaceans. In an effort to reduce biofouling, the applicant has indicated that biofouling reduction strategies will be implemented (e.g., regular inspections and maintenance, brushing, pressure washing). Therefore, the increase in biofouling from the modified netting material is likely to be negligible and the effects due to fish aggregation from the proposed project modifications are insignificant.

Entanglement

Regarding entanglement concerns, the modified project will increase the operational footprint (e.g., the total area used from the water surface to seafloor), include more lines in the water column, add more structures on the seafloor, and change the primary cage netting material from copper to monofilament. The facility footprint is being increased because a stationary grid system requires an anchoring design that is different than a swivel point system as consulted on during the 2022 permit. More details about the mooring and cage design can be found in Enclosure 5 and within the Section titled Summary of Proposed Changes to the Facility.

While the number of mooring lines is greater than the 2022 permitting action (see Table 2), EPA does not expect there to be an increase in effects to listed species beyond those that have previously been considered. As noted in the 2022 permit consultation, the risk of entanglement in mooring lines is reduced by using durable materials such as thick rope and steel chain that will be always maintained under tension. In the 2022 permit consultation, the applicant agreed to encase the bridle lines in rigid pipe to minimize entanglement risks because the mooring system was not designed to be in tension. Due to the proposed change in net pen mooring from a swivel mooring to a grid mooring system, the bridle lines will no longer be slack during the fish farming operation. A 2023 global review of aquaculture entanglements found that tensioning of mooring lines decreases risks from entanglement while also noting that there are instances of marine mammal physical interactions that result in fatal entanglements at offshore finfish farms.⁷ The only time that some lines may be slack is when the cage is raised and lowered (e.g., maintenance or storm events). As the applicant has agreed to implement a protected species monitoring plan, farm workers will be able to monitor for any listed species interactions during most situations that the cage is being raised and lowered. The entanglement risks that are associated with an increased quantity of gear are mitigated by the stationary grid system that will be maintained under tension to reduce the risk of entanglement to listed species and marine mammals. Therefore, the addition of mooring lines will not increase the risk of entanglement to any listed species and the effects from entanglement due to the project gear modifications are insignificant.

Regarding entanglement risks related to the net material (KikkoNet) – it is a hard plastic chain-link material that is highly predator resistant and withstands oceanic conditions for several years. The Kikkonet material has a long history of being used in marine aquaculture internationally. Unlike woven monofilament netting, Kikkonet is a UV stabilized polyethylene terephthalate monofilament. Kikkonet is kept in tension and is rigid like the previous copper alloy mesh netting considered in the

⁶ Lowell, J.M.S. 2012. Effect of netting materials on fouling and parasite egg loading on offshore net pens in Hawaii. Final Report, Blue Ocean Mariculture (2012), pp. 1-5. < <https://internationalcopper.org/wp-content/uploads/2017/05/Trematode-Study.pdf> >

⁷ Bath G.E., Price C.A., Riley K.L., Morris J.A. Jr. 2023. A global review of protected species interactions with marine aquaculture. Review in Aquaculture; 1-34. doi:10.1111/raq.12811

2022 permit consultation. A previous EA⁸ and biological opinion⁹ evaluated the usage of advanced monofilaments like Kikkonet in marine aquaculture and found that its rigidity offers lower risk of entanglement of marine mammals and helps prevent cage breaches. In open ocean environments, the net material is kept in tension which reduces the likelihood of entanglement. In addition, the KikkoNet proposed is the same mesh size as the original proposed mesh size (40mm). The risk of entanglement, particularly by sea turtles, in the mesh netting is unchanged from the 2022 permit consultation. Furthermore, Ocean Era is required to develop operational practices (e.g., net pen inspections, routine net maintenance, debris removal, and monitoring of net pen thickness material) that ensures structural integrity and limits the risk of entanglement.¹⁰ Therefore, the permit modification associated with changing the net material will not increase the risk of entanglement to any listed species and the effects due to the project modification are insignificant.

The length of time the facility will be deployed, and the small-scale nature of the system, are additional factors that make entanglement impacts to ESA-listed species highly unlikely to occur or extremely minor in severity. The gear changes associated with the modified project will not pose any increased effects to ESA-listed species and critical habitat beyond those previously evaluated. Additionally, Ocean Era will use a PSMP throughout the permit term that was developed in coordination with NMFS to protect and monitor for any protected species, and collect data on potential interactions between aquaculture facilities and protected species.

Marine Debris

The use of Kikkonet netting material instead of copper alloy mesh may introduce plastic particles into the marine environment due to the natural wear and tear of the mesh netting over time. While the Kikkonet mesh is known to be very durable for extended periods of time, there is the potential for some amount of wear and tear which may lead to plastic leaching into the water column. However, due to the durability of the netting, regular netting inspections, and the short time span of the project (only 1 year), the effects from natural wear and tear of the KikkoNet to listed species is expected to be insignificant.

Effects to Critical Habitat

The proposed project does not overlap with any critical habitats as shown in Table 4. Therefore, the proposed project modifications will not have any effect on any critical habitats.

Based on the foregoing, there is a limited amount of new information related to the revised project cage material, increased gear, and changed fish species that was not previously considered by EPA, USACE, NOAA Sea Grant, or NMFS. EPA has elected to reinstate informal consultation based on new information being available that was not previously considered under 50 CFR 402.16(a)(2).

⁸ State of Hawaii. 2009. Final Environmental Assessment/Finding of No Significant Impact for HA-3497. State of Hawaii, Department of Land and Natural Resources. < https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2009-05-08-HA-FSEA-Kona-Blue-Water-Aquafarm.pdf >

⁹ NMFS. 2022. Endangered Species Act (ESA) Section 7(a)(2) biological Opinion for authorization to install new net pens and ongoing, revised mariculture operations by Blue Ocean Mariculture, LLC. NMFS File No. PIR-2018-10334.

¹⁰ Ocean Era is required to monitor the structural integrity of the system pursuant to NPDES permit. Ocean Era has proposed to regularly monitor the strength of the net pen material that includes measuring the width of the netting. When any netting is measured to be less than 1.4 mm due to degradation or material elongation, the fish will be removed and the net pen will be retired. Net pen material replacement is unlikely given the 1-year duration of cage deployment.

3. If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence. (50 CFR 402.16(a)(3))

A *biological opinion* is a document that provides the opinion of the Service(s) as to whether the Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. A biological opinion was not prepared by NMFS or USFWS for the 2022 permit because a “may affect, likely to adversely affect” determination was not made. NMFS and USFWS used the 2019 BE as the basis for not preparing a biological opinion on the proposed federal actions and did not identify any reasonable and prudent measures to minimize any take incidental to otherwise lawful activities. Therefore, the changes to the project are not relevant to a biological opinion.

Regarding the written concurrences previously by NMFS in 2019 and 2022, the concurrences did not consider the new information described in item 2 above. All routes of exposure that were analyzed in the 2019 BE and 2022 LOC remain appropriate, and the proposed modifications are not anticipated to cause an effect to listed species or critical habitat that was not considered in the previous consultation or NMFS’s LOC. However, some details associated with subsequent modifications to the proposed project may not have been previously considered in evaluating potential impacts to ESA species and habitat. In order to ensure that all project revisions that were not previously evaluated in NMFS’s written concurrences that may cause an effect to ESA-listed species or critical habitat are properly considered in the ESA consultation process, EPA elects to reinstate informal consultation based on 50 CFR 402.16(a)(3).

4. If a new species is listed or critical habitat designated that may be affected by the identified action. (50 CFR 402.16(a)(4))

EPA has identified and evaluated below the endangered and threatened species and critical habitats that have been listed or proposed to be listed since the 2022 permit issuance. Other than the listings identified, there are no new or proposed species listings or critical habitat designations that could be affected by the modified action. Based on the evaluation described below, EPA has determined that the modified action will have no effect on the following newly listed or proposed species or critical habitats. Given that the federal action agencies are making a “no effect” determination for the newly listed species and critical habitat listed below, EPA is not required to reinstate ESA consultation with NMFS under 50 CFR 402.16(a)(4).

Queen conch (*Aliger gigas*)

On February 14, 2024, NMFS published a notice in the Federal Register (89 FR 11208) listing the queen conch as a threatened species under the ESA. The queen conch’s maximum habitat depth is 30 meters; the project is located at a water depth of 40 meters. The increased quantity of anchors or ballast blocks placed on the seafloor will not have any effect on ESA-listed coral species due to the facility location being outside the conch’s habitat. Additionally, the NPDES permit requires Ocean Era to stay 500 meters away from any hardbottom habitat. EPA and USACE have determined that this project would have no effect on the queen conch based on the project location being outside the queen conch’s habitat range.

Nassau grouper (*Epinephelus striatus*)

Critical habitat for the threatened Nassau grouper was designated effective February 1, 2024 (89 FR 126). The 920 miles² of critical habitat for the Nassau grouper was in various locations in the Atlantic

Ocean and southern portions of Gulf of Mexico. The proposed project is not located near the designated critical habitat; therefore, there is no effect on the Nassau grouper critical habitat.

Rice's whale (*Balaenoptera ricei*)

NMFS proposed to designate critical habitat for the Rice's whale within the Gulf of Mexico on July 24, 2023 (88 FR 47453). The waters from the 100-meter isobath to the 400-meter isobath were identified as the core distribution area that informed the proposed critical habitat designation. The proposed project is located well-inshore of the 100-meter bathymetry boundary in approximately 40-meters of water depth. Therefore, there will not be any direct impacts such as entanglement, from the proposed project as previously considered, or the proposed project modification to the proposed Rice's whale critical habitat.

The physical and biological features that are essential to support the conservation of the critical habitat are prey, marine water quality, and sufficiently quiet conditions. As analyzed in the previous consultation, the project may adversely affect water quality due to uneaten feed, ammonia excretions, fish feces, chemicals, cleaning, etc. As noted in the previous consultation, the effluent from the project will not extend more than 30-meters (0.02 miles) away from the project location. As the amount of production from the proposed project modifications is slightly decreased from the original proposal, the effluent radius is not expected to change significantly. Thirty meters from the project location is still in approximately 40-meters of water depth. Therefore, any water quality effects from the project are not expected to extend into the proposed critical habitat for Rice's whales. In addition, as this is a one cage one year demonstration project, the water quality effects are expected to be short-lived. Therefore, there will not be any expected impacts from this proposed project, including the project modification to the water quality feature of the proposed Rice's whale critical habitat. A similar lack of effects is expected to the prey feature of the proposed critical habitat. This project also will not have any effects on the quiet conditions feature, as any sound associated with the project will be well inshore of the 100-meter bathymetry boundary of the proposed critical habitat.

Therefore, since the facility is not located near the proposed Rice's whale critical habitat and will have no effect on the proposed physical and biological features, there will be no effects from the project to the proposed Rice's whale critical habitat. EPA notes that this effects determination for proposed Rice's whale critical habitat does not change the "not likely to adversely affect" determination made for the Rice's whale (see NMFS's determination for the 2022 permit NPDES permit).

Green sea turtle (*Chelonia mydas*)

On July 19, 2023, NMFS proposed to designate new areas of critical habitat for the Green sea turtle in nearshore waters (from the mean high-water line to 20 meters depth) off the coasts of Florida, Texas, and other areas within the Atlantic and Pacific Oceans (88 FR 46572). The essential features that are needed in specific areas to support the life-history needs of the Green sea turtle are not impacted based on the modified project being outside of the 20-meter isobath. There are no expected effects from the proposed project on the proposed green sea turtle critical habitat because the newly proposed critical habitat areas are inshore of this project.

Pillar coral (*Dendrogyra cylindrus*)

NMFS proposed to change the status of pillar coral from threatened to endangered due to multiple threats to the species on August 29, 2023 (88 FR 59494). The increased quantity of anchors or ballast blocks on the ocean bottom will not have any effect on ESA-listed coral species due to the facility location being outside all known invertebrate habitat. Additionally, placement of facility related structures must stay 500 meters away from any hardbottom habitat in accordance with NPDES permit. As a result of this project not overlapping with any areas of hard bottom including pillar coral, there are no expected effects to pillar coral from this project.

Summary of Effect Determinations on Potentially Affected NMFS ESA-Listed Species and Critical Habitat

The listed species and critical habitat that may be present in the action area or overlap with the action have been assessed. The federal action agencies determination of the project’s potential effects are summarized in Tables 3 and 4.

Table 3 – ESA-listed Species in the Action Area and Effect Determination(s)

Species	ESA Listing Status	Listing Rule/Date	Most Recent Recovery Plan Date	Effect Determination (Species)
Sea Turtles				
Green (South Atlantic DPS)	T	81 FR 20057 – 04/06/2016	1991	NLAA
Kemp’s ridley	E	35 FR 18319 – 12/2/1970	2011	NLAA
Leatherback	E	35 FR 8491 – 06/02/1970	1992	NLAA
Loggerhead (Northwest Atlantic DPS)	T	76 FR 58868 – 09/22/2011	2008	NLAA
Hawksbill	E	35 FR 8491 – 06/02/1970	1993	NE
Fish				
Smalltooth sawfish (U.S. DPS)	E	68 FR 15674 – 04/01/2003	2009	NLAA
Nassau grouper	T	81 FR 42268 – 06/29/2016	2018	NE
Giant manta ray	T	83 FR 2916 – 01/22/2018	2019	NLAA
Oceanic whitetip shark	T	83 FR 4153 – 01/30/2018	2018	NLAA
Invertebrates				
Elkhorn coral	T	71 FR 26852 – 05/09/2006	2015	NE
Staghorn coral	T	71 FR 26852 -05/09/2006	2015	NE
Boulder star coral	T	79 FR 53852 – 09/10/2014	N/A	NE
Mountainous star coral	T	79 FR 53852 – 09/10/2014	N/A	NE
Lobed star coral	T	79 FR 53852 – 09/10/2014	N/A	NE
Rough cactus coral	T	79 FR 53852 – 09/10/2014	N/A	NE
Pillar coral	E	79 FR 53852 – 09/10/2014	N/A	NE
Queen conch	T	89 FR 11208 – 02/14/2024	N/A	NE
Marine Mammals				
Blue whale	E	35 FR 18319 – 12/02/1970	1998	NE
Fin whale	E	35 FR 12222 – 12/02/1970	2010	NE
Sei whale	E	35 FR 12222 – 12/02/1970	2011	NE
Sperm whale	E	35 FR 12222 – 12/02/1970	2010	NE
Rice’s whale	E	84 FR 15446 – 04/15/2019	2020	NE

Table 3 abbreviations: E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = no effect

Table 4 – Critical Habitat(s) in the Action Area and Effect Determination(s)

Species	Critical Habitat in the Action Area	Critical Habitat Rule/Date	Effect Determination (Critical Habitat)
Sea Turtles			
Green (South Atlantic DPS)	0-20 m isobath	88 FR 46572 – 07/19/2023	NE
Fish			
Nassau grouper	Southern Gulf	89 FR 126 – 02/01/2024	NE
Marine Mammals			
Rice’s whale	100-400 m isobath	88 FR 47453 – 07/24/2023	NE

Table 4 abbreviations: NLAA = may affect, not likely to adversely affect; NE = no effect

Enclosure 2 - Final Biological Evaluation for the 2022 NPDES permit dated September 30, 2020

**Final
BIOLOGICAL EVALUATION**

Ocean Era, Inc. - Vellella Epsilon
Marine Aquaculture Facility
Outer Continental Shelf
Federal Waters of the Gulf of Mexico

September 30, 2020



**U.S. Environmental Protection Agency
Region 4**

Water Protection Division
61 Forsyth Street SW
Atlanta Georgia 30303

**NPDES Permit Number
FLOA00001**



**US Army Corps
of Engineers®**

**U.S. Army Corps of Engineers
Jacksonville District**

Fort Myers Permit Section
1520 Royal Palm Square Boulevard Suite 310
Fort Myers Florida 33919-1036

**Department of the Army Permit Number
SAJ-2017-03488**

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1.0 Introduction and Federal Coordination

In accordance with the Endangered Species Act (ESA) Section 7, interagency consultation and coordination with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) is required to insure that any action authorized, funded, or carried out by an action agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of any designated critical habitat (Section 7(a)(2)); and confer with the NMFS and USFWS on any agency actions that are likely to jeopardize the continued existence of any species that is proposed for listing or result in the destruction or adverse modification of any critical habitat proposed to be designated (Section 7(a)(4)).¹

On November 9, 2018, the U.S. Environmental Protection Agency Region 4 (EPA) received a complete application for a National Pollutant Discharge Elimination System (NPDES) permit from Ocean Era (formerly Kampachi Farms) for the point-source discharge of pollutants from a marine aquaculture facility in federal waters of the Gulf of Mexico (Gulf). On November 10, 2018, the U.S. Army Corps of Engineers Jacksonville District (USACE) received a completed Department of Army (DA) application pursuant to Section 10 of the Rivers and Harbors Act for structures and work affecting navigable federal waters from the same marine aquaculture facility.

Given that the action of permitting the proposed project involves more than one federal agency, the EPA has elected to act as the lead agency to fulfill the consultation responsibilities pursuant to the implementing regulations of ESA Section 7.² The USACE is a cooperating and co-federal agency for this informal consultation request. The completion of the informal consultation shall satisfy the EPA's and USACE's obligations under ESA Section 7(a)(2).

The EPA and the USACE (action agencies) have reviewed the proposed activity and determined that a biological evaluation (BE) is appropriate. The BE was prepared by the EPA and the USACE to jointly consider the potential direct, indirect, and cumulative effects that the proposed actions may have on listed and proposed species as well as designated and proposed critical habitat, and to assist the action agencies in carrying out their activities for the proposed action pursuant to ESA Section 7(a)(2) and ESA Section 7(a)(4). The EPA and the USACE have provided this BE for consideration by the USFWS and the NMFS in compliance with the ESA Section 7.

The EPA and USACE coordinated the interagency permitting process as required by the interagency Memorandum of Understanding (MOU) for Permitting Offshore Aquaculture Activities in Federal Waters of the Gulf,³ and conducted a comprehensive analysis of all applicable environmental requirements required by the National Environmental Policy Act (NEPA); however, a consolidated cooperation process under NEPA was not used to satisfy the requirements of ESA Section 7 as described in 50 CFR § 402.06.⁴ The NMFS was a cooperating agency for the NEPA analysis and has provided scientific expertise related to the BE and NEPA analysis for the proposed action including information about: site selection, ESA-listed species, marine

¹ The implementing regulations for the Clean Water Act related to the ESA require the EPA to ensure, in consultation with the NMFS and USFWS, that "any action authorized the EPA is not likely to jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat" (40 CFR § 122.49(c)).

² 50 CFR § 402.07 allows a lead agency: "When a particular action involves more than one Federal agency, the consultation and conference responsibilities may be fulfilled through a lead agency. Factors relevant in determining an appropriate lead agency include the time sequence in which the agencies would become involved, the magnitude of their respective involvement, and their relative expertise with respect to the environmental effects of the action. The Director shall be notified of the designation in writing by the lead agency."

³ On February 6, 2017, the Memorandum of Understanding for Permitting Offshore Aquaculture Activities in Federal Waters of the Gulf of Mexico became effective for seven federal agencies with permitting or authorization responsibilities.

⁴ 50 CFR § 402.06 states that "Consultation, conference, and biological assessment procedures under section 7 may be consolidated with interagency cooperation procedures required by other statutes, such as the National Environmental Policy Act (NEPA) (implemented at 40 CFR Parts 1500 - 1508) or the Fish and Wildlife Coordination Act (FWCA)."

mammal protection, and essential fish habitat. While some information related to the ESA evaluation is within the coordinated NEPA document developed by multiple federal agencies, the attached BE is provided as a stand-alone document to comply with the consultation process under ESA Section 7.

2.0 Proposed Action

Ocean Era, Inc. (applicant) is proposing to operate a pilot-scale marine aquaculture facility (Velella Epsilon) in federal waters of the Gulf. The proposed action is the issuance of permits under the respective authorities of the EPA and the USACE as required to operate the facility. The EPA's proposed action is the issuance of a NPDES permit that authorizes the discharge of pollutants from an aquatic animal production facility into federal waters of the United States. The USACE's proposed action is the issuance of a DA permit pursuant to Section 10 of the Rivers and Harbors Act that authorizes anchorage to the sea floor and structures affecting navigable waters.

3.0 Proposed Project

The proposed project would allow the applicant to operate a pilot-scale marine aquaculture facility with up to 20,000 albacore jack (*Seriola rivoliana*) being reared in federal waters for a period of approximately 12 months (total deployment of the cage system is 18 months). Based on an estimated 85 percent survival rate, the operation is expected to yield approximately 17,000 fish. Final fish size is estimated to be approximately 4.4 pounds (lbs) per fish, resulting in an estimated final harvest weight of 80,000 lbs considering a 10% mortality rate. The fingerlings will be sourced from brood stock that are located at Mote Aquaculture Research Park, in Sarasota, Florida, and were caught in the Gulf near Madeira Beach, Florida. As such, only F1 progeny will be stocked into the proposed project.

One support vessel will be used throughout the life of the project. The vessel will always be present at the facility except during certain storm events or times when resupplying is necessary. The support vessel would not be operated during any time that a small craft advisory is in effect for the proposed action area. The support vessel is expected to be a 70 ft long Pilothouse Trawler (20 ft beam and 5 ft draft) with a single 715 HP engine. The vessel will also carry a generator that is expected to operate approximately 12 hours per day. Following harvest, cultured fish would be landed in Florida and sold to federally licensed dealers in accordance with state and federal laws. The exact type of harvest vessel is not known; however, it is expected to be a vessel already engaged in offshore fishing activities in the Gulf.

A fully enclosed and submersible single copper pen that is offshore strength (PolarCirkel-style) will be deployed on an engineered multi-anchor swivel (MAS) mooring system. The engineered MAS will have up to three anchors for the mooring, with a swivel and bridle system. The design drawings provided for the engineered MAS uses three concrete deadweight anchors for the mooring; however, the final anchor design will likely utilize embedment anchors instead. The cage material for the proposed project is constructed with rigid and durable materials (copper mesh net with a diameter of 4-millimeter (mm) wire and 40 mm x 40 mm mesh square). The mooring lines for the proposed project will be constructed of steel chain (50 mm thick) and thick rope (36 mm) that are attached to a floating cage that will rotate in the prevailing current direction; the ocean currents will maintain the mooring rope and chain under tension during most times of operation. The bridle line that connects from the swivel to the cage will be encased in a rigid pipe. Structural information showing the MAS and pen, along with the tethered supporting vessel, is provided in Appendix A. The anchoring system for the proposed project is being finalized by the applicant. While the drawings in Appendix A show concrete deadweight anchors, it is likely that the final design will utilize appropriately sized embedment anchors instead. Both anchor types are included for ESA consultation purposes.

The cage design is flexible and self-adjusts to suit the constantly changing wave and current conditions. As a result, the system can operate floating on the ocean surface or submerged within the water column of the ocean; however, the normal operating condition of the cage is below the water surface. When a storm approaches the area, the entire cage can be submerged by using a valve to flood the flotation system with water. A buoy remains on the surface, marking the net pen's position and supporting the air hose. When the pen approaches the bottom, the system can be maintained several meters above the sea floor. The cage system is able to rotate around the MAS and adjust to currents while it is submerged and protected from storms. After storm events, the cage system is made buoyant again by pumping air back into the flotation system, causing the system to rise to resume normal operational conditions. The proposed project cage will have at least one properly functioning global positioning system device to assist in locating the system in the event it is damaged or disconnected from the mooring system.

In cooperation with the NMFS, a protected species monitoring plan (PSMP) has been developed for the proposed action to protect all marine mammal, reptiles, sea birds, and other protected species. Monitoring will occur throughout the life of the project and represents an important minimization measure to reduce the likelihood of any unforeseen potential injury to all protected species including ESA-listed marine animals. The data collected will provide valuable insight to resource managers about potential interactions between aquaculture operations and protected species. The PSMP also contains important mitigative efforts such as suspending vessel transit activities when a protected species is observed to come within 100 meters (m) of the activity until the animal(s) leave the area. The project staff will suspend all surface activities (including stocking fish, harvesting operations, and routine maintenance operations) in the unlikely event that any protected species is observed to come within 100 m of the activity until the animal leaves the area. Furthermore, should there be activity that results in an injury to protected species, the on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement.⁵

The below information about chemicals, drugs, cleaning, and solid waste provides supporting details about the proposed project:

Chemicals: The proposed facility has indicated they would not be using toxic chemicals, cleaners, or solvents at the proposed project. The proposed project would use small amounts of petroleum to run the generator. Spills are unlikely to occur; however, if spills did occur, they would be small in nature.

Drugs: The applicant has indicated that FDA-approved antibiotics or other therapeutants will not likely be used (within any feed or dosing the rearing water) during the proposed project.⁶ The need for drugs is minimized by the strong currents expected at the proposed action area, the low fish culture density, the cage material being used, and the constant movement of the cage.

Cleaning: The applicant does not anticipate the need to clean the cage for the short duration of the proposed project. Should the cage system need cleaning, divers would manually scrub the cage surfaces with cleaning brushes. No chemicals would be used while cleaning and any accumulated marine biological matter would be returned to sea without alteration.

Solid Wastes: The applicant will dispose of all solid waste appropriately on shore.

⁵ A PSMP has been developed by the applicant with assistance from the NMFS Protected Resources Division. The purpose of the PSMP is to provide monitoring procedures and data collection efforts for species (marine mammals, sea turtles, seabirds, or other species) protected under the MMPA or ESA that may be encountered at the proposed project.

⁶ The applicant is not expected to use any drugs; however, in the unlikely circumstance that therapeutant treatment is needed, three drugs were provided to the EPA as potential candidates (hydrogen peroxide, oxytetracycline dihydrate, and florfenicol).

4.0 Proposed Action Area

The proposed project will be placed in the Gulf at an approximate water depth of 40 m (130 feet), and generally located 45 miles southwest of Sarasota, Florida. The proposed facility will be placed within an area that contains unconsolidated sediments that are 3 – 10 ft deep (see Table 1). The applicant will select the specific location within that area based on diver-assisted assessment of the sea floor when the cage and anchoring system are deployed. The proposed action area is a 1,000 m radius measured from the center of the MAS.

The facility potential locations were selected with assistance from NOAA’s National Ocean Service National Centers for Coastal Ocean Science (NCCOS). The applicant and the NCCOS conducted a site screening process over several months to identify an appropriate project site. Some of the criteria considered during the site screening process included avoidance of corals, coral reefs, submerged aquatic vegetation, hard bottom habitats, and avoidance of marine protected areas, marine reserves, and habitats of particular concern. This siting assessment was conducted using the Gulf AquaMapper tool developed by NCCOS.⁷

Upon completion of the site screening process with the NCCOS, the applicant conducted a Baseline Environmental Survey (BES) in August 2018 based on guidance developed by the NMFS and EPA.⁸ The BES included a geophysical investigation to characterize the sub-surface and surface geology of the sites and identify areas with a sufficient thickness of unconsolidated sediment near the surface while also clearing the area of any geohazards and structures that would impede the implementation of the aquaculture operation. The geophysical survey for the proposed project consisted of collecting single beam bathymetry, side scan sonar, sub-bottom profiler, and magnetometer data within the proposed area. The BES report noted that there were no physical, biological, or archaeological features within the surveyed area that would preclude the siting of the proposed aquaculture facility within the area shown in Table 1.

Table 1: Target Area with 3’ to 10’ of Unconsolidated Sediments

Location	Latitude	Longitude
Upper Left Corner	27° 7.70607’ N	83° 12.27012’ W
Upper Right Corner	27° 7.61022’ N	83° 11.65678’ W
Lower Right Corner	27° 6.77773’ N	83° 11.75379’ W
Lower Left Corner	27° 6.87631’ N	83° 12.42032’ W

⁷ The Gulf AquaMapper tool is available at: <https://coastalscience.noaa.gov/products-explorer/>

⁸ The BES guidance document is available at: http://sero.nmfs.noaa.gov/sustainable_fisheries/Gulf_fisheries/aquaculture/

5.0 Federally Listed and Proposed Threatened and Endangered Species and Critical Habitat

5.1 Federally Listed Threatened and Endangered Species

The action agencies identified the ESA-listed species shown in Table 2 for consideration on whether the proposed action may affect protected species in or near the proposed action area. In summary, the action agencies considered the potential affects to threatened and endangered species from five groups of species: birds (2), fish (4), invertebrates (7), marine mammals (6), and reptiles (5). The action agencies considered the species within this Section of the BE because they may occur within the project footprint or near enough such that there are potential routes of effects. Certain ESA-listed species are not discussed because their behavior, range, habitat preferences, or known/estimated location do not overlap or expose them to the activities within the proposed action area.

Table 2: Federally Listed Species, Listed Critical Habitat, Proposed Species, and Proposed Critical Habitat Considered for the Proposed Action

Species Considered	ESA Status	Critical Habitat Status	Potential Exposure to Proposed Action Area
Birds			
1 Piping Plover	Threatened	Yes	No
2 Red Knot	Threatened	No	No
Fish			
1 Giant Manta Ray	Threatened	No	Yes
2 Nassau Grouper	Threatened	No	Yes
3 Oceanic Whitetip Shark	Threatened	No	Yes
4 Smalltooth Sawfish	Endangered	No	Yes
Invertebrates			
1 Boulder Star Coral	Threatened	No	No
2 Elkhorn Coral	Threatened	No	No
4 Mountainous Star Coral	Threatened	No	No
5 Pillar Coral	Threatened	No	No
7 Staghorn Coral	Threatened	No	No
6 Rough Cactus Coral	Threatened	No	Yes
3 Lobed Star Coral	Threatened	No	Yes
Marine Mammals			
1 Blue Whale	Endangered	No	Yes
2 Bryde's Whale	Endangered	No	Yes
3 Fin Whale	Endangered	No	Yes
4 Humpback Whale	Endangered	No	Yes
5 Sei Whale	Endangered	No	Yes
6 Sperm Whale	Endangered	No	Yes
Reptiles			
1 Green Sea Turtle	Threatened	No	Yes
2 Hawksbill Sea Turtle	Endangered	Yes	Yes
3 Kemp's Ridley Sea Turtle	Endangered	No	Yes
4 Leatherback Sea Turtle	Endangered	Yes	Yes
5 Loggerhead Sea Turtle	Threatened	Yes	Yes

5.1.1 Birds

There are 14 ESA-listed avian species identified as threatened or endangered, previously delisted, or candidate species in the eastern Gulf. Of those species, only two listed species, the piping plover and red knot, are considered in this BE because their migratory range could expose them to activities covered under the proposed action. There are several other listed species whose range includes only inshore and coastal margin waters and are not exposed to the activities covered under the proposed action.

Piping Plover

The piping plover is a threatened shorebird that inhabits coastal sandy beaches and mudflats. Three populations of piping plover are recognized under ESA: Great Lakes (endangered); Great Plains (threatened); and Atlantic (threatened) (BOEM, 2012a). This species nests in sand depressions lined with pebbles, shells, or driftwood. Piping plovers forage on small invertebrates along ocean beaches, on intertidal flats, and along tidal pool edges; therefore, fish from the proposed action are not considered a potential source of food for the piping plover.

Possibly as high as 75% of all breeding piping plovers, regardless of population affiliation, may spend up to eight months on wintering grounds in the Gulf. They arrive from July through September, leaving in late February to migrate back to their breeding sites (BOEM, 2012b). They do not breed in the Gulf. Habitat used by wintering birds include beaches, mud flats, sand flats, algal flats, and washover passes (where breaks in sand dunes result in an inlet). The piping plover is considered a state species of conservation concern in all Gulf coast states due to wintering habitat. The piping plover is a migratory shorebird with no open ocean habitat.

Red Knot

The red knot, listed as threatened in 2014, is a highly migratory shorebird species that travels between nesting habitats in Arctic latitudes and southern non-breeding habitats in South America and the U.S. Atlantic and Gulf coasts (BOEM, 2012a). Red knots forage along sandy beaches, tidal mudflats, salt marshes, and peat banks for bivalves, gastropods, and crustaceans (USFWS, 2015). Horseshoe crab eggs are a critical food resource for this species, and the overharvesting and population declines of horseshoe crabs may be a major reason for the decline of red knot numbers.

Wintering red knots may be found in Florida and Texas (Würsig, 2017). They are considered a State Species of Conservation Concern in Florida and Mississippi. The numbers of wintering and staging red knots using coastal beaches in Gulf coast states other than Florida have declined dramatically (Würsig, 2017). Its population has exhibited a large decline in recent decades and is now estimated in the low ten-thousands (NatureServe, 2019). Critical habitat rules have not been published for the red knot. Within the Gulf region, wintering red knots are found primarily in Florida, but this species has been reported in coastal counties of each of the Gulf states.

5.1.2 Fish

The four species of ESA-protected fish that may occur within the action area are: giant manta ray, nassau grouper, smalltooth sawfish, and oceanic whitetip shark.

Giant Manta Ray

The giant manta ray was listed as threatened under the ESA on February 21, 2018. The giant manta ray is found worldwide in tropical, subtropical, and temperate seas. These slow-growing, migratory animals are circumglobal with fragmented populations. The giant manta ray is the largest living ray, with a wingspan reaching a width of up to 9 m. Manta species are distinguished from other rays in that they tend to be larger with a terminal mouth, and have long cephalic lobes (Evgeny, 2010), which are extensions of the pectoral fins

that funnel water into the mouth. Giant manta rays feed primarily on planktonic organisms such as euphausiids, copepods, mysids, decapod larvae and shrimp, but some studies have noted their consumption of small and moderately sized fishes (Miller and Klimovich, 2017).

Within the Southeast Region of the United States, the giant manta ray is frequently sighted along the east coast and within the Gulf of Mexico. Giant manta rays are seasonal visitors along productive coastlines with regular upwelling, in oceanic island groups, and near offshore pinnacles and seamounts. Given the opportunistic sightings of the species, researchers are still unsure what drives giant manta rays to certain areas and not others (and where they go for the remainder of the time). The timing of these visits varies by region and seems to correspond with the movement of zooplankton, current circulation and tidal patterns, seasonal upwelling, seawater temperature, and possibly mating behavior. Although giant manta rays are considered oceanic and solitary, they have been observed congregating at cleaning sites at offshore reefs and feeding in shallow waters during the day at depths less than 10 m (O'Shea et al., 2010; Marshall et al., 2011; Rohner et al., 2013). The giant manta ray ranges from near shore to pelagic habitats, occurring over the continental shelf near reef habitats and offshore islands. The species can be found in estuarine waters near oceanic inlets, with use of these waters as potential nursery grounds. This species appears to exhibit a high degree of plasticity in terms of their use of depths within their habitat.

Nassau Grouper

The Nassau grouper is a reef fish typically associated with hard structure such as reefs (both natural and artificial), rocks, and ledges. It is a member of the family Serranidae, which includes groupers valued as a major fishery resource such as the gag grouper and the red grouper. These large fish are found in tropical and subtropical waters of southern coastal Florida and the Florida Keys. Nassau grouper are generally absent from the Gulf north and outside of the Florida Keys; this is well documented by the lack of records in Florida Fish and Wildlife Conservation Commission's, Fisheries Independent Monitoring data, as well as various surveys conducted by NOAA Fisheries Southeast Fisheries Science Center. There has been one verified report of the Nassau Grouper in the northwest Gulf at Flower Gardens Bank national marine sanctuary; however, the Flower Gardens Bank is not near the proposed action area.

Oceanic Whitetip Shark

The oceanic whitetip shark is a large, open ocean, highly migratory, apex predatory shark found in subtropical waters throughout the Gulf. It is a pelagic species usually found offshore in the open ocean, on the outer continental shelf, or around oceanic islands in deep water greater than 184 m. The oceanic whitetip shark can be found from the surface to at least 152 m depth. Occasionally, it is found close to land in waters as shallow as 37 m, mainly around mid-ocean islands or in areas where the continental shelf is narrow with access to nearby deep water. Oceanic whitetip sharks have a strong preference for the surface mixed layer in warm waters above 20°C and are therefore mainly a surface-dwelling shark.

Oceanic whitetip sharks are high trophic-level predators in open ocean ecosystems feeding mainly on teleosts and cephalopods (Backus et al., 1956; Bonfil et al., 2008); however, some studies have found that they consume sea birds, marine mammals, other sharks and rays, mollusks, crustaceans, and even garbage (Compagno, 1984; Cortés, 1999).

Smalltooth Sawfish

The smalltooth sawfish was the first marine fish to receive protection as an endangered species under the ESA in 2003. Their current range is poorly understood but believed to have significantly contracted from these historical areas. Today, smalltooth sawfish primarily occur off peninsular Florida from the Caloosahatchee River to the Florida Keys (Würsig, 2017). Historical accounts and recent encounters suggest immature individuals are most common in shallow coastal waters less than 25 m (Bigelow and Schroeder, 1953; Adams

and Wilson, 1995). Smalltooth sawfish primarily live in shallow coastal waters near river mouths, estuaries, bays, or depths up to 125 m. Smalltooth sawfish feed primarily on fish. Mullet, jacks, and ladyfish are believed to be their primary food resources (Simpfendorfer, 2001). Smalltooth sawfish also prey on crustaceans (mostly shrimp and crabs) by disturbing bottom sediment with their saw (Norman and Fraser, 1938; Bigelow and Schroeder, 1953).

5.1.3 Invertebrates

The seven ESA-listed coral species in the Gulf are known to occur near the Dry Tortugas, a small group of islands located approximately 67 miles west of Key West, Florida. Four of the ESA-listed coral species in the Gulf (elkhorn, lobed star, mountainous star, and boulder star) are known to occur in the Flower Banks National Marine Sanctuary, located 70 to 115 miles off the coast of Texas and Louisiana. The most abundant depth ranges for the ESA-listed invertebrates are provided in Table 3. Given the known geographic locations of the considered coral species and their recognized habitat preferences related to water depth, only two invertebrate species (lobed star coral and rough cactus coral) may occur in the proposed action area. Threats to coral communities throughout the Gulf include predation, hurricane damage, and loss of habitat due to algal overgrowth and sedimentation.

Table 3: ESA-listed Coral Depth Ranges

Coral Species	Most Abundant Depth (ft)
Boulder Star Coral	3 - 82 ⁹
Elkhorn Coral	3 - 16 ¹⁰
Lobed Star Coral	6 - 130 ¹¹
Mountainous Star Coral	3 - 30 ¹¹
Pillar Coral	3 - 90
Rough Cactus Coral	15 - 270 ¹⁰
Staghorn Coral	15 - 60 ¹⁰

5.1.4 Marine Mammals

All the ESA-listed marine mammals considered in this BE are endangered under the ESA. The six species of whales that could occur within the action area are: blue whale, fin whale, Gulf Bryde’s whale, humpback whale, sperm whale, and sei whale; however, except for the Gulf Bryde’s whale, each ESA-listed whale considered in this BE are not common in the Gulf (Würsig, 2017). Threats to whales from aquaculture facilities include vessel strikes, entanglement, and disturbance (ocean noise).

Blue Whales

Blue whales are found in all oceans except the Arctic Ocean. Currently, there are five recognized subspecies of blue whales. Blue whales have been sighted infrequently in the Gulf. The only record of blue whales in the Gulf are two strandings on the Louisiana and Texas coasts; however, the identifications for both strandings are questionable. In the North Atlantic blue whales are most often seen off eastern Canada where they are present year-round (NMFS, 2016). Blue whales also typically occur in deeper waters seaward of the continental shelf and are not commonly observed in the waters of the Gulf or off the U.S. East Coast (CeTAP, 1982; Wenzel et al., 1988; Waring et al., 2006). Blue whales are not expected to be within the proposed action area that is located in a water depth of approximately 40 m.

⁹ www.DCNaNature.org, 2016

¹⁰ NMFS, 2016

¹¹ www.IUCNRedList.org, 2016

Bryde's Whale

The Gulf Bryde's whale was listed as endangered on May 15, 2019. The Gulf Bryde's whales are members of the baleen whale family and are a subspecies of the Bryde's whale. The Gulf Bryde's whales are one of the most endangered whales in the world, with likely less than 100 whales remaining. They are the only resident baleen whale in the Gulf. The Gulf Bryde's whale is one of the few types of baleen whales that do not migrate and remain in the Gulf year-round. The historical range in Gulf waters is not well known; however, scientists believe that the historical distribution of Gulf Bryde's whales once encompassed the north-central and southern Gulf. For the past 25 years, Bryde's whales in U.S. waters of the Gulf have been consistently located in the northeastern Gulf (largely south of Alabama and the western part of the Florida panhandle) along the continental shelf break between the 100 and 400 m depth (Labrecque et al., 2015). This area has been identified as a Biologically Important Area (BIA) for the Gulf Bryde's whale and encompasses over 5.8 million acres. BIAs are reproductive areas, feeding areas, migratory corridors, or areas in which small and resident populations are concentrated. The proposed action area is not located near the areas where the Gulf Bryde's whale is known to be distributed and are not expected to occur at the water depth of the proposed project.

Fin Whales

Fin whales are found in deep, offshore waters of all the world's oceans, primarily in temperate to polar climates. The NMFS has reported that there are about 2,700 fin whales in the North Atlantic and Gulf. There are few reliable reports of fin whales in the northern Gulf. They are most commonly found in North Atlantic waters where they feed on krill, small schooling fish, and squid (NMFS, 2016). Fin whales are generally found along the 100 m isobath with sightings also spread over deeper water including canyons along the shelf break (Waring et al., 2006). Therefore, fin whales are not expected to be found near the proposed action area where the water depth is approximately 40 m.

Humpback Whales

Based on a few confirmed sightings and one stranding event, humpback whales are rare in the northern Gulf (BOEM, 2012a). Baleen whale richness in the Gulf is believed to be less than previously understood (Würsig, 2017). U.S. populations of humpback whales mainly use the western North Atlantic for feeding grounds and use the West Indies during winter and for calving (NMFS, 2016). Given that humpback whales are not a typical inhabitant of the Gulf, they are not expected to be found near the proposed action area. Additionally, the water depth at the proposed action area (40 m) does not overlap the habitat preference of humpback whales for deeper waters.

Sei Whales

The sei whale is rare in the northern Gulf and its occurrence is considered accidental, based on four reliable and one questionable strandings records in Louisiana and Florida (Jefferson and Schiro, 1997; Schmidley, 2004; Würsig, 2017). Sei whales are more commonly found in subtropical to subpolar waters of the continental shelf and slope of the Atlantic, with movement between the climates according to seasons (NMFS, 2016). Sei whales typically occur in deeper waters seaward of the continental shelf and are not commonly observed in the waters of the Gulf (CeTAP, 1982; Wenzel et al., 1988; Waring et al., 2006). Sei whales are not expected to be geographically located near the proposed project.

Sperm Whales

In the northern Gulf, aerial and ship surveys indicate that sperm whales are widely distributed and present in all seasons in continental slope and oceanic waters. Sperm whales are the most abundant large cetacean in the Gulf. Greatest densities of sperm whales are in the central Northern Gulf near Desoto Canyon as well as near the Dry Tortugas (Roberts et al., 2016). They are found in deep waters throughout the world's oceans, but generally in waters greater than 200 to 800 m due to the habit of feeding on deep-diving squid and fish (Hansen et al., 1996; Davis et al., 2002; Mullin and Fulling, 2003; Würsig, 2017). Research conducted since 2000

confirms that Gulf sperm whales constitute a distinct stock based on several lines of evidence (Waring et al., 2006). Sperm whales are not expected to be within the proposed action area due to their known preference for deeper water.

5.1.5 Reptiles

The five ESA-listed sea turtle species that may occur in or near the proposed action area are: green, hawksbill, leatherback, kemp's ridley, and loggerhead. Sea turtles are highly migratory and travel widely throughout the Gulf. Therefore, each sea turtle has the potential to occur throughout the entire Gulf. In general, the entire Gulf coastal and nearshore area can serve as habitat for marine turtles. Florida is the most important nesting area in the United States for loggerhead, green, and leatherback turtles. Several volumes exist that cover the biology and ecology of these species (i.e., Lutz and Musick, 1997; Lutz et al., 2003, Wynnekan et al., 2013).

Green sea turtle

Green sea turtle hatchlings are thought to occupy pelagic areas of the open ocean and are often associated with *Sargassum* rafts (Carr, 1987; Walker, 1994). Pelagic stage green sea turtles are thought to be carnivorous. Stomach samples of these animals found ctenophores and pelagic snails (Frick, 1976; Hughes, 1974). At approximately 20 to 25 centimeters (cm) carapace length, juveniles migrate from pelagic habitats to benthic foraging areas (Bjorndal, 1997). As juveniles move into benthic foraging areas, a diet shift towards herbivory occurs. They consume primarily seagrasses and algae, but are also known to consume jellyfish, salps, and sponges (Bjorndal, 1980, 1997; Paredes, 1969; Mortimer, 1981, 1982). The diving abilities of all sea turtle species vary by their life stages. The maximum diving range of green sea turtles is estimated at 110 m (Frick, 1976), but they are most frequently making dives of less than 20 m (Walker, 1994). The time of these dives also varies by life stage.

The NMFS and USFWS removed the range-wide and breeding population ESA listings of the green sea turtle and listed eight distinct population segments (DPSs) as threatened and three DPSs as endangered, effective May 6, 2016. Two of the green sea turtle DPSs, the North Atlantic DPS and the South Atlantic DPS, occur in the Gulf. The proposed action area is within the North Atlantic NPS where the green sea turtle is listed as threatened.

Hawksbill sea turtle

The hawksbill sea turtle's pelagic stage lasts from the time they leave the nesting beach as hatchlings until they are approximately 22 to 25 cm in straight carapace length (Meylan, 1988; Meylan and Donnelly, 1999). The pelagic stage is followed by residency in developmental habitats (foraging areas where juveniles reside and grow) in coastal waters. Little is known about the diet of pelagic stage hawksbills. Adult foraging typically occurs over coral reefs, although other hard-bottom communities and mangrove-fringed areas are occupied occasionally. Hawksbills show fidelity to their foraging areas over several years (van Dam and Diéz, 1998). The hawksbill's diet is highly specialized and consists primarily of sponges (Meylan, 1988). Gravid females have been noted ingesting coralline substrate (Meylan, 1984) and calcareous algae (Anderes, Alvarez, and Uchida, 1994), which are believed to be possible sources of calcium to aid in eggshell production. The maximum diving depths of these animals are unknown, but the maximum length of dives is estimated at 73.5 minutes, more routinely dives last about 56 minutes (Hughes, 1974). Hawksbill sea turtles are not known to regularly nest in Florida but do occur occasionally.

Kemp's Ridley sea turtle

Kemp's ridley sea turtle hatchlings are also pelagic during the early stages of life and feed in surface waters (Carr, 1987; Ogren, 1989). After the juveniles reach approximately 20 cm carapace length they move to relatively shallow (less than 50 m) benthic foraging habitat over unconsolidated substrates (Márquez-M.,

1994). They have also been observed transiting long distances between foraging habitats (Ogren, 1989). Kemp's ridleys feeding in these nearshore areas primarily prey on crabs, though they are also known to ingest mollusks, fish, marine vegetation, and shrimp (Shaver, 1991). The fish and shrimp Kemp's ridleys ingest are not thought to be a primary prey item but instead may be scavenged opportunistically from bycatch discards or discarded bait (Shaver, 1991). Given their predilection for shallower water, Kemp's ridleys most routinely make dives of 50 m or less (Soma, 1985; Byles, 1988). Their maximum diving range is unknown. Depending on the life stage, a Kemp's ridley may be able to stay submerged anywhere from 167 minutes to 300 minutes, though dives of 12.7 minutes to 16.7 minutes are much more common (Soma, 1985; Mendonca and Pritchard, 1986; Byles, 1988). Kemp's ridley turtles may also spend as much as 96 percent of their time underwater (Soma, 1985; Byles, 1988). In the United States, Kemp's ridley turtles inhabit the Gulf and northwest Atlantic Ocean; nesting occurs primarily in Texas, and occasionally in Florida, Alabama, Georgia, South Carolina, and North Carolina.

Leatherback sea turtle

Leatherback sea turtles are the most pelagic of all ESA-listed sea turtles and spend most of their time in the open ocean. They will enter coastal waters and are seen over the continental shelf on a seasonal basis to feed in areas where jellyfish are concentrated. Leatherbacks feed primarily on cnidarians (medusae, siphonophores) and tunicates. Unlike other sea turtles, leatherbacks' diets do not shift during their life cycles. Because leatherbacks' ability to capture and eat jellyfish is not constrained by size or age, they continue to feed on these species regardless of life stage (Bjorndal, 1997). Leatherbacks are the deepest diving of all sea turtles. It is estimated that these species can dive more than 1,000 m (Eckert et al., 1989) but more frequently dive to depths of 50 m to 84 m (Eckert et al. 1986). Dive times range from a maximum of 37 minutes to more routines dives of 4 to 14.5 minutes (Standora et al., 1984; Eckert et al., 1986; Eckert et al., 1989; Keinath and Musick, 1993).

Loggerhead sea turtle

Loggerhead sea turtle hatchlings forage in the open ocean and are often associated with Sargassum rafts (Hughes, 1974; Carr 1987; Walker, 1994; Bolten and Balazs, 1995). The pelagic stage of these sea turtles are known to eat a wide range of things including salps, jellyfish, amphipods, crabs, syngnathid fish, squid, and pelagic snails (Brongersma, 1972). Stranding records indicate that when pelagic immature loggerheads reach 40 to 60 cm straight-line carapace length, they begin to live in coastal inshore and nearshore waters of the continental shelf throughout the U.S. Atlantic (Witzell, 2002). Loggerhead sea turtles forage over hard-bottom and soft-bottom habitats (Carr, 1986).

Benthic foraging loggerheads eat a variety of invertebrates with crabs and mollusks being an important prey source (Burke et al., 1993). Estimates of the maximum diving depths of loggerheads range from 211 m to 233 m (Thayer et al., 1984; Limpus and Nichols, 1988). The lengths of loggerhead dives are frequently between 17 and 30 minutes (Thayer et al., 1984; Limpus and Nichols, 1988; Limpus and Nichols, 1994; Lanyon et al., 1989) and they may spend anywhere from 80 to 94 percent of their time submerged (Limpus and Nichols, 1994; Lanyon et al., 1989). Loggerhead sea turtles are a long-lived, slow-growing species, vulnerable to various threats including alterations to beaches, vessel strikes, and bycatch in fishing nets.

5.2 Federally Listed Critical Habitat In or Near the Action Area

5.2.1 Birds

Onshore critical habitat has been designated for the piping plover including designations for coastal wintering habitat areas in Alabama, Mississippi, and Florida.¹² The proposed project is not expected to impact any onshore habitats.

5.2.2 Reptiles

The only critical habitat designated near the proposed action area is the Northwest Atlantic DPS of loggerhead sea turtles. Specific areas of designated habitat include: nearshore reproductive habitat, winter area, breeding areas, migratory corridors, and Sargassum habitat. The northwest Atlantic loggerhead DPS designated critical habitat portion that occurs in federal waters (*i.e.*, a Sargasso habitat unit) consists of the western Gulf to the eastern edge of the loop current, through the Straits of Florida and along the Atlantic coast from the western edge of the Gulf Stream eastward. Sargassum habitat is home to most juvenile sea turtles in the western Gulf.

5.3 Federal Proposed Species and Proposed Critical Habitat

The action agencies did not identify any Federally-listed proposed species or proposed critical habitat in the proposed action area.

¹² Critical habitat locations for the piping plover are available at: <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B079>

6.0 Potential Stressors to Listed and Proposed Species and Critical Habitat

The action agencies evaluated the potential impacts of the proposed project on ESA-listed species that were identified in Section 5.0 and that may occur in or near the proposed action area. Potential effects considered in this analysis may occur because of a potential overlap between the proposed aquaculture facility location with the species habitat (socialization, feeding, resting, breeding, etc.) or migratory route. Section 6.0 broadly describes the most likely stressors, directly and indirectly, that were considered to potentially impact the species near the proposed facility. The action agencies identified four categories of risks from the proposed project: disturbance; entanglement; vessel collisions; and impacts from water quality. The specific analysis of potential impacts to each species from the proposed project is provided in Section 7.0.

6.1 Disturbance

Disturbance in the context of this BE includes ocean noise (low-frequency underwater noises) and breakage (invertebrates). Underwater noises can interrupt the normal behavior of whales, which rely on sound to communicate. As ocean noise increases from human sources, communication space decreases and whales cannot hear each other, or discern other signals in their environment as they used to in an undisturbed ocean. Different levels of sound can disturb important activities, such as feeding, migrating, and socializing. Mounting evidence from scientific research has documented that ocean noise also causes marine mammals to change the frequency or amplitude of calls, decrease foraging behavior, become displaced from preferred habitat, or increase the level of stress hormones in their bodies. Loud noise can cause permanent or temporary hearing loss. Underwater noise threatens whale populations, interrupting their normal behavior and driving them away from areas important to their survival. Increasing evidence suggests that exposure to intense underwater sound in some settings may cause some whales to strand and ultimately die.

ESA-listed sea turtles, whales, and fish may experience stress due to a startled reaction should they encounter vessels, or vessel noise, at the proposed location or in transit to the proposed project site. The reaction could range from the animal approaching and investigating the activity, to the opposite reaction of flight, where the animal could injure itself while attempting to flee. The most likely source of disturbance from the proposed aquaculture activity would be noise from the vessel engines and barge generator.

6.2 Entanglements

Entanglement, for the purposes of this BE, refers to the wrapping of lines, netting, or other man-made materials around the body of a listed species. Entanglement can result in restraint and/or capture to the point where harassment, injury, or death occurs. The cage, mooring lines, and bridles from the proposed project may pose an entanglement risk to listed species in the project area; however, entanglement risks to ESA-listed species at any aquaculture operation are mitigated by using rigid and durable cage materials, and by keeping all facility lines taut as slack lines are the primary source of entanglements (Nash et al., 2005).

Past protected species reviews by the NMFS for a similar scale aquaculture project determined that cetacean and sea turtle entanglement is not expected when facility mooring and tether lines are kept under near-constant tension and free of loops (NMFS, 2016). Additionally, the NMFS determined that a similar aquaculture project had the potential to result in interactions with marine mammals; however, the NMFS found that the most likely effect of the project on marine mammals was behavioral interactions (e.g., individuals engaging in investigative behavior around the array or that prey on wild fish accumulated near the facility) as opposed to causing injury or mortality from entanglement.

6.3 Vessel Strike

A vessel strike is a collision between any type of boat and a marine animal in the ocean. All sizes and types of vessels have the potential to collide with nearly any marine species. Strikes can result in death or injury to the

marine animal and may go unnoticed by the vessel operator. Some marine species spend short durations “rafting” at the ocean’s water surface between dives which makes them more vulnerable to vessel strikes.

The NMFS estimates collisions between some cetaceans and vessels are relatively rare events based on data from Marine Mammal Stock Assessments for the Atlantic and Gulf (NMFS, 2017). Collisions between marine mammals and vessels can be further minimized when vessels travel at less than 10 knots based on general guidance from the NMFS for vessels transiting areas where there are known populations of whales (HIHWNMS, 2011). Detection of sea turtles by vessel operators may be more difficult because most vessel operators usually sight protected species and avoid them. In past biological opinions in support of similar aquaculture activities, the NMFS has determined that the rate of collisions between sea turtles and vessels was negligible and did not expect sea turtle vessel strikes to occur (NMFS, 2016).

The support vessel used for the proposed project is expected to be vigilant against the possibility of protected species collisions. Piloting of all vessels associated with the proposed project will be done in a manner that will prevent vessel collisions or serious injuries to protected species. Operators and crew will operate vessels at low speeds when performing work within and around the proposed project area and operate only when there are no small craft advisories in effect. All vessels are expected to follow the vessel strike and avoidance measures that have been developed by the NMFS.¹³ These operating conditions are expected to allow vessel operators the ability to detect and avoid striking ESA-listed species.

6.4 Water Quality

Although offshore marine cage systems do not generate a waste stream like other aquaculture systems, effluent from the proposed action area can adversely affect water quality, sea floor sediment composition, and benthic fauna though the additions of uneaten feed, ammonia excretions, and fish feces from the increased fish biomass. Water quality in aquaculture is primarily assessed through measures of nitrogen (N), phosphorus (P), solids (total suspended solids, settleable solids, and turbidity), dissolved oxygen (DO), and pH. The increased amount of organic material has the potential to increase N, P, and solids levels in the surrounding waters. The concentration of N (such as total nitrogen, ammonia, nitrate, nitrite) and P (as total phosphorus or orthophosphate) are indicators of nutrient enrichment and are commonly used to assess the impact of aquaculture on water quality. The release of nutrients, reductions in concentrations of DO, and the accumulation of sediments under certain aquaculture operations can affect the local environment by boosting overall productivity in phytoplankton and macroalgal production in marine ecosystems through eutrophication and degradation of benthic communities (Stickney, 2002).

According to *Marine Cage Culture and The Environment* (Price and Morris, 2013), “there are usually no measurable effects 30 meters beyond the cages when the farms are sited in well-flushed water. Nutrient spikes and declines in dissolved oxygen sometimes are seen following feeding events, but there are few reports of long-term risk to water quality from marine aquaculture.” Price and Morris (2013) also considered the benthic effects of Marine Cage Culture and found that “well-managed farms may exhibit little perturbation and, where chemical changes are measured, impacts are typically confined to within 100 meters of the cages. Benthic chemical recovery is often rapid following harvest”. Conversely, poorly managed farms or heavily farmed areas, can see anaerobic conditions persisting and extending hundreds of meters beyond the aquaculture facility. Changes in water quality associated with commercial scale marine aquaculture facilities can be measurable downstream for approximately 205 m (Nash et al., 2005).

¹³ The NMFS has determined that collisions with any vessel can injure or kill protected species (e.g., endangered and threatened species, and marine mammals). The vessel strike avoidance guidelines developed by the NMFS are the standard measures that should be implemented to reduce the risk associated with vessel strikes or disturbance of these protected species to discountable levels. NMFS Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners; revised February 2008.

The NCCOS reviewed global siting data to identify aquaculture site characteristics that are best suited for water quality protection, concluding that, "Protection of water quality will be best achieved by siting farms in well-flushed waters." (Price, 2013). The hydrology near the proposed action area has powerful and mixing ocean currents that would constantly flush and dilute particulate and dissolved wastes. In addition, the proposed action has other attributes cited in this study that contributes to decreased water quality impacts, including deep waters and a sand bottom type. Neither particulates nor dissolved metabolites are expected to accumulate due to low fish production levels and the near constant flushing of the cage by strong offshore currents that dissipate wastes.

The EPA evaluated the proposed action's potential impacts to water quality, impacts of organic enrichment to the seafloor, and impacts to benthic communities from organic enrichment as required by Sections 402 and 403 of the CWA. The EPA determined that discharges from the proposed facility are not expected to exceed federally recommended water quality criteria; that the discharged material is not sufficient to pose an environmental threat through seafloor bioaccumulation; and the potential for benthic impacts from the proposed project are minimal.¹⁴ Additionally, the EPA considered recent environmental modeling performed by the NMFS for a similar small scale aquaculture facility (Velella Delta).¹⁵ NCCOS concluded that there are minimal risks to water column or benthic ecology functions in the subject area from the operation of the fish cage as described in the applicant's proposal. Furthermore, EPA reviewed the previous and current environmental monitoring data collected from a commercial-scale marine aquaculture facility, Blue Ocean Mariculture (BOM) in Hawaii, raising the same fish species.¹⁶ While the size of the proposed project is significantly smaller than the BOM commercial-scale facility and BOM is in slightly deeper waters, the results show that soluble and particulate nutrients from the BOM facility do not substantially affect the marine environment. Based on EPA's analysis, as well as a review and comparison of representative water quality information, the proposed action would not likely raise particulate and dissolved nutrient concentrations in the proposed action area.

The proposed facility will be covered by a NPDES permit as an aquatic animal production facility with protective conditions required by the Clean Water Act. The NPDES permit will contain conditions that will confirm EPA's determination and ensure no significant environmental impacts will occur from the proposed project. The aquaculture-specific water quality conditions placed in the NPDES permit will generally include a comprehensive environmental monitoring plan. The applicant will be required to monitor and sample certain water quality, sediment, and benthic parameters at a background (up-current) location and near the cage. Additionally, the NPDES permit will include effluent limitations expressed as best management practices (BMPs) for feed management, waste collection and disposal, harvest discharge, carcass removal, materials storage, maintenance, record keeping, and training. Impacts to water quality will be reduced by a range of operational measures through the implementation of project-specific BMPs. For example, feeding will always

¹⁴ Further information about EPA's analysis and determination for impacts to water quality, seafloor, and benthic habitat can be found in the final NPDES permit and the Ocean Discharge Criteria (ODC) Evaluation, as well as other supporting documents for the NPDES permit such as the Essential Fish Habitat Assessment and the NEPA evaluation.

¹⁵ The NCCOS previously produced models to assess the potential environmental effects on water quality and benthic communities for the applicant's Velella Delta project that is similar Velella Epsilon in terms of fish production (approximately 120,000 lbs), operation duration, and cultured species; however, the water depth was dissimilar between the two projects (6,000 ft vs. 130 ft). At maximum capacity, NCCOS determined there were no risks to water quality from the Velella Delta project, and only insignificant effects would occur in the water column down to 100 feet. Because of the great depth, strong currents, and physical oceanographic nature of the Velella Delta site, dissolved wastes would be widely dispersed and assimilated by the planktonic community. Furthermore, the model results showed that benthic impacts and accumulation of particulate wastes would not be detectable through measurement of organic carbon or infaunal community biodiversity.

¹⁶ Water quality information from a Blue Ocean Mariculture (BOM) facility in Hawaii was reviewed as representative data and compared to the proposed project. The BOM farm previously produced approximately 950,000 lbs/yr prior to 2014 and has produced up to 2,400,000 lbs/yr after 2014. The BOM facility is in a similar depth of water as the proposed project with an average depth of 60 m. Over eight years of comprehensive water quality and benthic monitoring, the BOM facility has not adversely impacted water quality outside of the mixing zone at the facility (BOM, 2014).

be monitored to ensure fish are fed at levels just below satiation to limit overfeeding and decrease the amount of organic material that is introduced into the marine environment. Moreover, the Essential Fish Habitat assessment requires certain mitigation measures within the NPDES and Section 10 permits.¹⁷

The EPA also considered the potential water quality impacts from chemical spills, drugs, cleaning, and solid wastes.

Chemical Spills: Spills are unlikely to occur; however, if spills do occur they are expected to be small in nature and dissipate rapidly due to strong currents in the project area. The terms and conditions of the NPDES permit would require the applicant to follow operational procedures (i.e. BMPs) that minimize the risk of wastes and discharges that may affect any ESA-listed species or habitat. The risk of accidental fuel or oil spills into the marine environment is minimized by the support vessel not being operated during any time that a small craft advisory is in effect at the proposed facility.

Drugs: The applicant indicated that FDA-approved antibiotics or other therapeutants will not likely be used during the proposed project due to the strong currents expected at the proposed action area, the low fish culture density, and the cage material being used. In the unlikely event that drugs/therapeutants are used, administration of drugs will be performed under the control of a licensed veterinarian and only FDA-approved therapeutants for aquaculture would be used as required by federal law. In addition, the NPDES permit will require that the use of any medicinal products be reported to the EPA, including therapeutics, antibiotics, and other treatments. The report will include types and amounts of medicinal product used and the duration they were used. The EPA does not expect the project to cause a measurable degradation in water quality from drugs that may affect any ESA-listed species.

Cleaning: Another potential source of water quality impacts would be from the cleaning of the cage system. The applicant does not anticipate the need to clean the cage for the short duration of the proposed project. Experience from previous trials by the applicant demonstrated that copper alloy mesh material used for the cage is resistant to fouling. Should the cage system need cleaning, divers would manually scrub the cage surfaces with cleaning brushes. No chemicals would be used while cleaning and any accumulated marine biological matter would be returned to sea without alteration.

Solid Wastes: Multiple federal laws and regulations strictly regulate the discharge of oil, garbage, waste, plastics, and hazardous substances into ocean waters. The NPDES permit prohibits the discharge of any solid material not in compliance with the permit.

¹⁷ The EPA and the USACE will require mitigation measures to be incorporated into the NPDES permit to avoid or limit organic enrichment and physical impacts to habitat that may support associated hardbottom biological communities. The NPDES permit will require facility to be positioned at least 500 meters from any hardbottom habitat; the DA permit will not authorize the anchor system to be placed on vegetated and/or hardbottom habitat.

7.0 Potential Effects of Action

Under the ESA, “effects of the action” means the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR § 402.02). The NMFS and USFWS standard for making a “no effect” finding is appropriate when an action agency determines its proposed action will not affect that ESA-listed species or critical habitat, directly or indirectly (USFWS and NMFS, 1998). Generally, a “no effect” determination means that ESA-listed species or critical habitats will not be exposed to any potentially harmful/beneficial elements of the action (NMFS, 2014).

The applicable standard to find that a proposed action “may affect, but not likely to adversely affect” (NLAA) listed species or critical habitat is that all the effects of the action are expected to be discountable, insignificant, or completely beneficial. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are those extremely unlikely to occur. Beneficial effects are contemporaneous positive effects without any adverse effects to the species or critical habitat.

A summary of the potential effects considered and the determination of impact for each listed species and critical habitat is provided in Table 4. Overall, potential impacts to the ESA-listed species considered in this BE are expected to be extremely unlikely and insignificant due to the small size of the facility, the short deployment period, unique operational characteristics, lack of geographic overlap with habitat or known migratory routes, or other factors that are described in the below sections for each species. The federal action agencies used multiple sources to support the determinations described within this section including the analysis of potential impacts that the NMFS used as the basis for its ESA determination for up to 20 commercial scale offshore marine aquaculture facilities in the Gulf (EPA, 2016; NMFS, 2009; NMFS, 2013; NMFS, 2015; NMFS, 2016).

7.1 Federally Listed Threatened and Endangered Species

7.1.1 Birds

The action agencies did not consider any potential threats to ESA-protected birds from the proposed project. The two species of birds considered are not expected to interact with the proposed project due to the distance between the proposed project from shore (approximately 45 miles) to their onshore habitat preferences. The piping plover and red knot are migratory shorebirds. Known migratory routes do not overlap with the proposed project. Both birds primarily inhabit coastal sandy beaches and mudflats of the Gulf; migration and wintering habitat are in intertidal marine habitats such as coastal inlets, estuaries, and bays (USFWS, 2015). Additionally, the normal operating condition of the cage is expected to be below the water surface which will further decrease the likelihood of any bird interaction with the proposed project.

The ESA-listed bird species will not be exposed to any potentially harmful impacts of the proposed action. The action agencies have determined that the activities under the proposed project will have no effect on the threatened species of birds.

7.1.2 Fish

The action agencies considered disturbance, entanglement (for smalltooth sawfish only), and water quality as potential impacts to endangered or threatened fish from the proposed project in the rare event that interaction occurs.

Impacts from disturbance, entanglement, and water quality are highly unlikely for each ESA-listed fish species that was considered given their unique habitat preferences and known proximity to the proposed action area.

The oceanic whitetip shark is not likely to occur near the proposed project given its preference for deeper waters. The action agencies believe that the Nassau grouper will not be present given that it is absent from the Gulf outside of the Florida Keys. Interactions with smalltooth sawfish with the proposed project is extremely unlikely because they primarily occur in the Gulf off peninsular Florida and are most common off Southwest Florida. The giant manta ray may encounter the facility given its migratory patterns; however, disturbance is not expected because the facility is small and will have a short deployment period of approximately 18 months.

Entanglement impacts were considered for smalltooth sawfish because it is the only listed fish species large enough to become entangled within the proposed facility's mooring lines. Entanglement risks to the smalltooth sawfish from the proposed project are minimized by using rigid and durable cage materials and by keeping all lines taut (as described in Section 3.0). The ocean currents will maintain the floating cage, mooring lines, and chain under tension during most times of operation. Additionally, the limited number of vertical mooring lines reduce the risk of potential entanglement by this listed fish species. Furthermore, interactions are anticipated to be highly unlikely given their current range in southwest Florida between Ft Myers and the Florida Keys. Because of the proposed project operations and lack of proximity to the known habitat for the smalltooth sawfish, the action agencies expect that the effects of this entanglement interaction would be discountable.

For water quality impacts, the EPA is proposing NPDES permit conditions required by the Clean Water Act. These permit provisions will contain environmental monitoring (water quality, sediment, and benthic infauna) and conditions that minimize potential adverse impacts to fish from the discharge of effluent from the proposed facility, and prohibit the discharge of certain pollutants (e.g., oil, foam, floating solids, trash, debris, and toxic pollutants). Due to the pilot-scale size of the facility, water quality and benthic effects are not expected to occur outside of 5-10 meters. The discharges authorized by the proposed NPDES permit represent a small incremental contribution of pollutants that are not expected to affect any ESA-listed fish species in or near the proposed action area.

Any potential effects from the proposed action on ESA-listed fish are discountable and insignificant. The action agencies have determined that the activities under the proposed project is NLAA the threatened and endangered species of fish.

7.1.3 Invertebrates

Potential routes of effects to coral from the proposed project include disturbance (breakage of coral structures) and water quality impacts (e.g., increased sedimentation, increased nutrient loading, and the introduction of pollutants).

Regarding disturbance, anthropogenic breakage is extremely unlikely and discountable because the proposed facility will not be in areas where listed corals may occur. Most of the ESA-listed invertebrate species are associated with coral reefs that occur in shallower areas of the Gulf and along the west Florida shelf. Only five species of the invertebrates considered (boulder star, elkhorn, mountainous star, pillar, and staghorn) are not known to occur near the proposed project location or at depths where the proposed facility is located. Only two invertebrate species (lobed star coral and rough cactus coral) may occur in the proposed action area. Moreover, the anchoring system and cage will be placed in an area consisting of unconsolidated sediments, away from potential hardbottom which may contain corals according to the facility's seafloor survey. Given the known geographic locations of the considered coral species and their recognized habitat preferences related to water depth, the disturbance effects of the proposed action is anticipated to be minimal and extremely unlikely.

Regarding impacts from water quality, the discharge from the proposed facility will be covered by a NPDES permit with water quality conditions required by the Clean Water Act. The aquaculture-specific water quality conditions contained in the NPDES permit will generally include an environmental monitoring plan (water quality, sediment, and benthic monitoring) and effluent limitations expressed as BMPs. Water quality effects are not expected to occur outside of 5-10 m due to the small size of the facility and low production levels. Sedimentation from the facility is not expected to occur outside of 1,000 m (assuming a maximum production for the entire duration of the project) with impacts resulting from the proposed facility likely limited to within 300-500 meters from the cage. The NPDES permit will prohibit discharges within 500 m of areas of biological concern, including live bottoms or coral reefs. The impacts from water quality and sedimentation are expected to be minimal or insignificant, and the likelihood that deleterious water quality will contribute to any adverse effects to listed coral species is extremely unlikely.

Any adverse effects from the proposed project on ESA-listed corals are discountable and insignificant. The action agencies have concluded that the proposed project will NLAA on the ESA-listed invertebrate species.

7.1.4 Marine Mammals

Generally, endangered whales are not likely to be adversely affected by any of the threats considered by the action agencies at or near the proposed facility because they are unlikely to overlap geographically with the small footprint of the proposed action area. All whales considered in this BE prefer habitat in waters deeper than the proposed action (40 m) as described in Section 5.1.4. The expected absence of the ESA-listed marine mammals in or near the proposed action area is an important factor in the analysis of whether impacts from the proposed project will have any effect on ESA-listed whales; however, the action agencies have still considered potential threats (disturbance, entanglement, vessel strikes, and water quality) to the six species of marine mammals considered in this BE.

Disturbance to marine mammals from ocean noise generated by the proposed facility is expected to be extremely low given the duration of the project, minimal vessel trips, and scale of the operation. The production cage will be deployed for a duration of approximately 18 months. Opportunities for disturbance from the vessel participating in the proposed project are minimal due to the limited trips to the site. The most likely source of disturbance from the proposed aquaculture activity would be noise from the vessel engines and barge generator. The noise emitted from the engines and generator would not significantly add to the frequency or intensity of ambient sound levels in the proposed action area and are not expected to be different from other vessels operating in federal waters. The action agencies believe that the underwater noise produced by operating a vessel and cage will not interfere with the ability of marine mammals to communicate, choose mates, find food, avoid predators, or navigate. The limited amount of noise from the proposed project would have negligible effect on ESA-listed whales.

Entanglement risks to marine mammals at any aquaculture operation are minimized by using rigid and durable cage materials and by keeping all lines taut. As described in Section 3.0, the cage material for the proposed project is constructed with rigid and durable materials that will significantly decrease the likelihood that ESA-listed species will become entangled. The limited number of vertical mooring lines (3) and the duration of cage deployment (approximately 18 months) will reduce the risk of potential entanglement by marine mammals. When the currents change, the lines would likely remain taut even as the currents shift because the weight of chain and rope create a negative buoyancy on the facility anchorage lines. While it is highly unlikely that ESA-listed whales would become entangled in the mooring lines; if incidental line contact occurs, serious harm to the listed whales or sea turtles is not likely due to the tension in the mooring lines. The cage will be constructed of semi-rigid copper alloy mesh with small openings that will further prevent entanglements.

Additionally, there have been no recorded incidents of entanglement from ESA-listed marine mammal species interacting with a permitted commercial-scale marine aquaculture facility in Hawaii (BOM, 2014). The depth of water and line length used at the proposed project would provide adequate spaces for most marine mammals to pass through. The proposed action would not likely entangle marine mammals as they are likely to detect the presence of the facility and would be able to avoid the gear; however, should entanglement occur, on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement. Furthermore, because of the location of the proposed project relative to marine mammal habitat, the action agencies anticipate the effects of entanglement are highly unlikely..

Regarding vessel strikes, facility staff will be stationed on one vessel for the duration of the project except during unsafe weather conditions. The probability that collisions with the vessel associated with the proposed project would kill or injure marine mammals is discountable, as the vessel will not be operated at speeds known to injure or kill marine mammals. Given the limited trips to the facility with only one vessel, and the high visibility of whales to small vessels, opportunities for strikes from the vessel participating in the proposed project are expected to be insignificant. Strikes from other vessels not operated by the facility are anticipated to be improbable due to the proximity to shore (~45 miles). Additionally, all vessels are expected to follow the vessel strike and avoidance measures that have been developed by the NMFS. Moreover, should there be any vessel strike that results in an injury to an ESA-protected marine mammal, the on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement.

Regarding potential impacts from water quality, each ESA-listed whale species considered in this BE is not expected to be affected given their unique habitat preferences and known proximity to the proposed action area. The discharge from the proposed facility will be covered by a NPDES permit with project-specific conditions that includes water quality monitoring and implementation of practices to protect the environment near the proposed action area. The discharge of wastewater from the proposed project are expected to have a minor impact on water quality due to factors concerning the low fish biomass produced; the relatively small amounts of pollutants discharged; depth of the sea floor; and current velocities at the proposed action area. It is anticipated that the proposed activity would add relatively small amounts of nutrient wastes (nitrogen, phosphorus, particulate organic carbon, and solids) to the ocean in the immediate vicinity of the proposed action area. The facility's effluent is expected to undergo rapid dilution from the prevailing current; constituents will be difficult to detect within short distances from the cage. The impacts from water quality are expected to be insignificant, and the likelihood of water quality impacts contributing to any adverse effects to ESA-listed marine mammals is extremely unlikely (see Section 6.4 for more information).

The action agencies believe that any adverse effects from the potential threats considered to ESA-listed marine mammals are extremely unlikely to occur and are discountable. The action agencies have determined that the activities authorized under the proposed permits will NLAA any marine mammals considered in this BE.

7.1.5 Reptiles

The action agencies considered disturbance, entanglement, vessel strike, and water quality as the only potential threats to reptiles within the proposed action area.

Sea turtles may experience disturbance by stress due to a startled reaction should they encounter vessels in transit to the proposed project site. Given the limited trips to the site, opportunities for disturbance from vessels participating in the proposed project are minimal. ESA-listed sea turtles may be attracted to aquaculture facilities as potential sources of food, shelter, and rest, but behavioral effects from disturbance are expected to be insignificant. Additionally, all vessels are expected to follow the vessel strike and avoidance measures that have been developed by the NMFS.⁷ Furthermore, there has been a lack of documented observations and records of ESA-listed sea turtles interacting with a permitted commercial-scale marine

aquaculture facility in Hawaii (BOM, 2014); we anticipate that such interactions would be unlikely. As a result, disturbance effects from human activities and equipment operation associated with the proposed action are expected to be insignificant on ESA-listed species.

The risk of sea turtles being entangled in an offshore aquaculture operation is greatly reduced by using rigid cage materials and by keeping all lines taut. Section 3 describes how the cage and mooring material for the proposed project is constructed with rigid and durable materials, and how the mooring lines will be constructed of steel chain and thick rope that will be maintained under tension by the ocean currents during most times of operation. Additionally, the bridle line that connects from the swivel to the cage will be encased in a rigid pipe. Moreover, the limited number of vertical mooring lines (three) and the duration of cage deployment (less than 18 months) will reduce the risk of potential entanglement by sea turtles. Because of the proposed project operations and duration, the action agencies expect that the effects of this entanglement interaction would be discountable; however, should entanglement occur, on-site staff would follow the steps outlined in the PSMP and alert the appropriate experts for an active entanglement.

In regard to vessel strikes, facility staff will use only one vessel for the duration of the project. The vessel will be operated at low speeds that are not known to injure or kill sea turtles; therefore, the probability that collisions with the vessel associated with the proposed project would kill or injure sea turtles is discountable. Opportunities for strikes to reptiles from the vessel participating in the proposed project are expected to be insignificant given the limited number of trips to the facility with one vessel. Strikes from other vessels not operated by the facility are anticipated to be improbable due to the proximity to shore. Additionally, all vessels are expected to follow the vessel strike and avoidance measures that have been developed by the NMFS.

The proposed activity would not add significantly to the volume of maritime traffic in the proposed action area. The number of trips associated with deploying and retrieving the facility components, routine maintenance, stocking, and harvest operations would minimally increase vessel traffic in the proposed action area. The project activities are not expected to result in collisions between protected species and any vessels. Collisions with ESA-listed species during the proposed activity would be extremely unlikely to occur.

Commercial and recreational fishermen are expected to visit the proposed project because it could act as a fish attraction device. While fishermen would be attracted to the project area from other locations, overall fishing efforts by these fishermen in federal fisheries would not increase as these fishermen would have fished elsewhere if the project was not in place. The action agencies do not expect increased fishing activity in the project area since there were no reports or observations of interactions between fishermen and ESA-listed species in previous *Verella* trials (*Verella* Beta and *Verella* Gamma) in Hawaii (NMFS, 2016).

The impacts from water quality are expected to be insignificant, and the likelihood of water quality impacts contributing to any adverse effects to ESA-listed reptiles in or near the proposed action area is extremely unlikely (see Section 6.4 for more information related to water quality impacts). The discharge from the proposed facility will be covered by a NPDES permit with project-specific conditions that includes water quality monitoring and implementation of practices to protect the environment. Water quality effects are not expected to occur outside of 5-10 m due to the low fish production levels and fast ocean currents.

Any adverse effects from the proposed project on ESA-listed reptiles are extremely unlikely to occur and are discountable. The action agencies have determined that the activities under the proposed permit will NLAA the sea turtles considered in this BE.

7.2 Federally Listed Critical Habitat

7.2.1 Reptiles

The action agencies identified vessel strike and water quality as the only potential routes of impacts to the loggerhead turtle DPS critical habitat of the Northwest Atlantic. In the Gulf, designated critical habitat consists of either nearshore reproductive habitat or Sargassum habitat. The proposed project is roughly 45 miles from shore and will not affect nearshore reproductive habitat. Therefore, the essential features of loggerhead turtle critical habitat that the proposed action may affect are foraging habitat for hatchlings and association of hatchlings around Sargassum mats.

Sargassum mats may be impacted by vessel traffic; however, the PSMP that was developed for the proposed project area includes a provision that trained observers will look for Sargassum mats and will inform vessel operators as to their location to avoid the mats to the maximum extent practicable. The proposed project will be sited in the open ocean environment, and Sargassum mats may infrequently drift into the project area; however, it is highly unlikely the proposed facility would impact Sargassum habitat further offshore where the facility will be located. Additionally, the facility will only bring the submerged aquaculture cage to the surface for brief periods to conduct maintenance, feeding, or harvest activities due to the high energy open-ocean environment where the proposed facility will be located.

Sargassum mats are not anticipated to be negatively impacted by water quality due to the conditions in the NPDES permit. Potential impacts on loggerhead critical habitat is expected to be discountable because of active monitoring for Sargassum mats and the extremely low likelihood of impacts from water quality.

The action agencies believe that the adverse effects from the proposed action on the Northwest Atlantic loggerhead DPS critical habitat will be insignificant due to location of the facility and operational methods used while the cage is deployed. The action agencies have determined that the activities under the proposed permit will not affect the listed sea turtle critical habitat.

7.2.2 Birds

Critical habitat has been designated for the piping plover for coastal wintering habitat areas in Florida; however, the proposed action does not interfere with any nearshore areas. Therefore, critical habitat for the piping plover will not be exposed to any potentially harmful elements of the proposed action. The action agencies have determined that the activities under the proposed project will have no effect to the piping plover's critical habitat.

7.3 Federal Proposed Species and Proposed Critical Habitat

The action agencies did not perform an analysis of impacts because no federally-listed proposed species or proposed critical habitat in or near the proposed action area were identified.

Table 4: Summary of potential impacts considered and ESA determination

Group and Species	Potential Impacts Considered	Potential Effect	Determination
Birds			
1 Piping Plover	None	None	No effect
2 Red Knot			
Fish			
1 Giant Manta Ray	Disturbance, entanglement, and water quality	Discountable and insignificant	May affect, but not likely to adversely affect
2 Nassau Grouper			
3 Oceanic Whitetip Shark			
4 Smalltooth Sawfish			
Invertebrates			
1 Boulder Star Coral	Disturbance and water quality	Discountable and insignificant	May affect, but not likely to adversely affect
2 Elkhorn Coral			
3 Mountainous Star Coral			
4 Pillar Coral			
5 Staghorn Coral			
6 Rough Cactus Coral			
7 Lobed Star Coral			
Marine Mammals			
1 Blue Whale	Disturbance, entanglement, vessel strike, and water quality	Discountable and insignificant	May affect, but not likely to adversely affect
2 Fin Whale			
3 Humpback Whale			
4 Sei Whale			
5 Sperm Whale			
6 Bryde's Whale			
Reptiles			
1 Green Sea Turtle	Disturbance, entanglement, vessel strike, and water quality	Discountable and insignificant	May affect, but not likely to adversely affect
2 Hawksbill Sea Turtle			
3 Kemp's Ridley Sea Turtle			
4 Leatherback Sea Turtle			
5 Loggerhead Sea Turtle			
Critical Habitat			
1 Hawksbill Sea Turtle	Vessel strike and water quality	Discountable and insignificant	May affect, but not likely to adversely affect
2 Leatherback Sea Turtle			
3 Loggerhead Sea Turtle			
4 Piping Plover			

8.0 Conclusion

The EPA and USACE conclude that the proposed project's potential threats (disturbance, entanglement, vessel strike, water quality) to ESA-listed species and critical habitat are highly unlikely to occur or extremely minor in severity; therefore, the potential effects to ESA protected species and critical habitats are discountable or insignificant.

8.1 Consultation with USFWS

The EPA and USACE have determined that the proposed project will have "no effect" on the listed species and critical habitat under the jurisdiction of the USFWS that may occur in the proposed action area and that may be affected. This determination includes the piping plover and the red knot and critical habitat for the piping plover. No other listed species, proposed species, critical habitats, or proposed critical habitats were considered under the authority of the USFWS because there is no evidence to support that a potential effect from the proposed project may occur. The EPA and USACE request concurrence from the USFWS for this determination under ESA § 7.

On August 13, 2019, EPA and USACE provided the jointly developed BE to USFWS and initiated consultation with USFWS. EPA and USACE determined that the discharges and structures authorized by the NPDES or RHA Section 10 permit will have "no effect" on any federally listed species, proposed species, or critical habitat for sea birds that are under the jurisdiction of the USFWS and within the proposed action area. On August 27, 2019, a USFWS provided notification that the USFWS does not object to the permit issuance for the proposed project and had no additional comments. Completion of the informal consultation with the USFWS satisfies EPA's obligations under ESA § 7(a)(2).

8.2 Consultation with NMFS

The EPA and USACE have determined that the proposed project "may affect, but is not likely to adversely affect" the listed species and critical habitat or designated critical habitat under the jurisdiction of the NMFS. This determination includes: four species of fish, seven species of invertebrates, six species of whales, reptiles from five species, and critical habitat for reptiles. No other listed species, proposed species, critical habitats, or proposed critical habitats were considered under the authority of the NMFS because there is no evidence to support that a potential effect from the proposed project may occur. The EPA and USACE request concurrence from the NMFS for this determination under ESA § 7.

On August 13, 2019, EPA and USACE provided the jointly developed BE to NMFS and initiated consultation with the NMFS. Regarding federally listed species, proposed species, or critical habitat under the jurisdiction of the NMFS, EPA and USACE determined that the proposed project "may affect, but not likely to adversely affect" certain fish, invertebrates, marine mammals, and reptiles within the proposed action area. On September 30, 2019, NMFS concluded "that the proposed action is not likely to adversely affect listed species under NMFS's purview." Completion of the informal consultation with the NMFS satisfies EPA's obligations under ESA § 7(a)(2).

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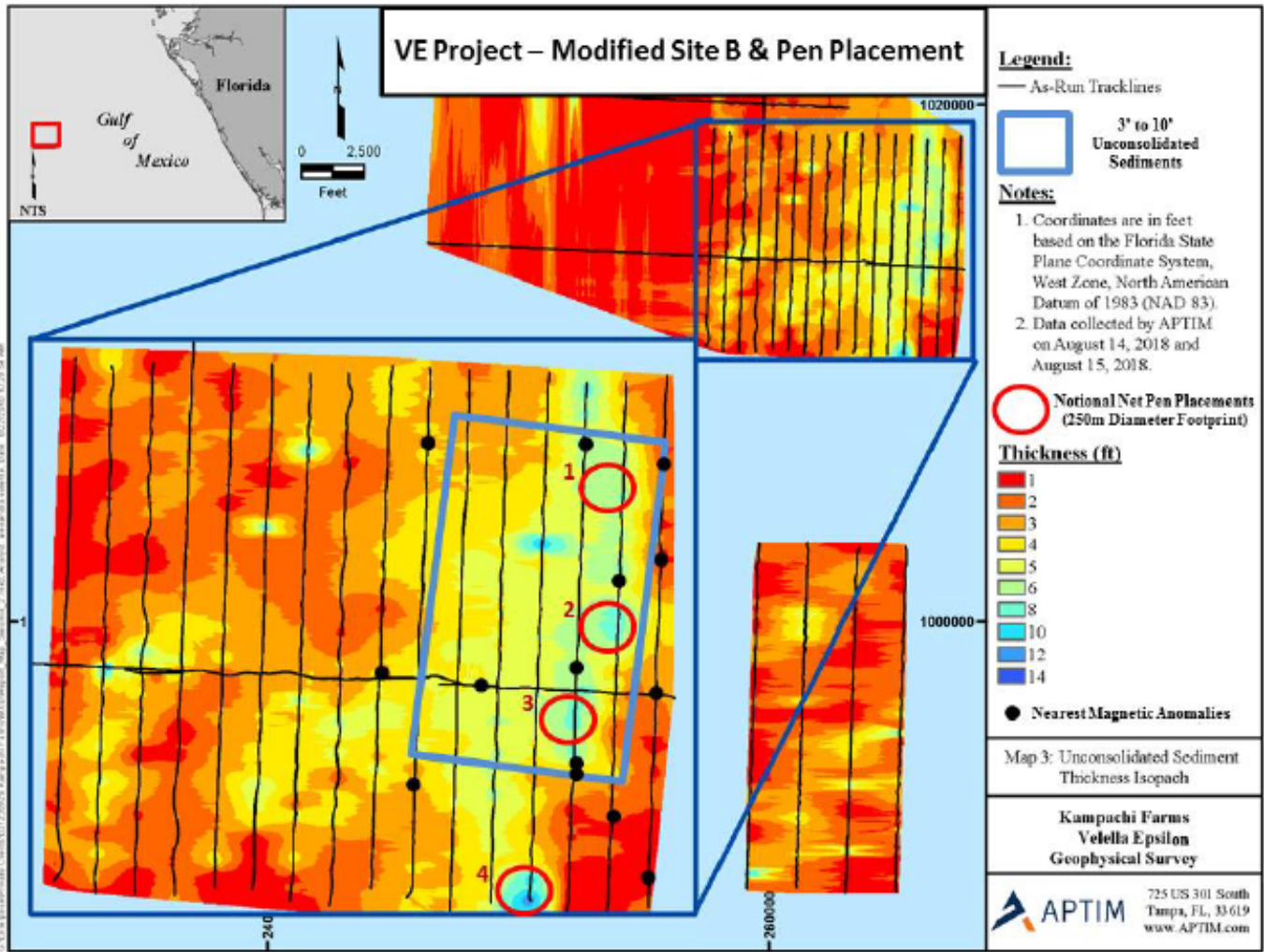
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Appendix B – Location Area



Position	° Decimal Latitude	° Decimal Longitude	Decimal Latitude	Decimal Longitude	Perimeter (km)	Area (km ²)
Modified Site B from BES Report						
Upper Left	27° 7.86863' N	83° 13.45827' W	27.131143° N	83.224303° W	11.1571	7.7237
Upper Right	27° 7.83079' N	83° 11.63237' W	27.130512° N	83.193872° W		
Lower Right	27° 6.43381' N	83° 11.69349' W	27.107230° N	83.194890° W		
Lower Left	27° 6.50261' N	83° 13.52658' W	27.108377° N	83.225442° W		
Center	27° 7.11266' N	83° 12.58604' W	27.118543° N	83.209767° W		
Targeted Subset Area of Modified Site B from BES Report (3' to 10' Unconsolidated Sediments)						
Upper Left	27° 7.70607' N	83° 12.27012' W	27.126445° N	83.204502° W	5.2273	1.6435
Upper Right	27° 7.61022' N	83° 11.65678' W	27.126837° N	83.194278° W		
Lower Right	27° 6.77773' N	83° 11.75379' W	27.112962° N	83.195897° W		
Lower Left	27° 6.87631' N	83° 12.42032' W	27.114605° N	83.207005° W		
Center	27° 7.34185' N	83° 12.02291' W	27.122365° N	83.200382° W		
Notional Net Pen Placements within Modified Site B from BES Report						
1	27° 7.54724' N	83° 11.85393' W	27.125787° N	83.197565° W	0.7854	0.0491
2	27° 7.17481' N	83° 11.82576' W	27.119580° N	83.197095° W		
3	27° 6.93930' N	83° 11.94780' W	27.115655° N	83.199130° W		
4	27° 6.52579' N	83° 12.09175' W	27.108763° N	83.201530° W		

Enclosure 3 - NMFS response letter to the 2022 permit's ESA consultation dated September 30, 2019



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
 Southeast Regional Office
 263 13th Avenue South
 St. Petersburg, Florida 33701-5505
<https://www.fisheries.noaa.gov/region/southeast>

09/30/2019

F/SER31:JLL
 SER-2019-02205

Christopher B. Thomas
 Chief, Permitting and Grants Branch
 U.S. Environmental Protection Agency
 Region 4
 Atlanta Federal Center
 61 Forsyth Street
 Atlanta, Georgia, 30303-8960

Dear Mr. Thomas:

This letter responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act (ESA) and the Fish and Wildlife Coordination Act (FWCA) for the following action.

Project Name	Applicant(s)	SER Number	Project Type
Veella Epsilon Marine Aquaculture Facility	Kampachi Farms, LLC	SER0-2019-02205	Offshore Cage Aquaculture, NPDES permit, Section 10 permits

Your request is on behalf of the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers Jacksonville District (USACE), the two federal agencies responsible for permitting aquaculture operations in federal waters of the Gulf of Mexico. The EPA is proposing to issue a National Pollutant Discharge Elimination System (NPDES) permit to Kampachi Farms, LLC for the point-source discharge of pollutants from their proposed Veella Epsilon marine aquaculture facility. The USACE is proposing to issue a Department of Army permit pursuant to Section 10 of the Rivers and Harbors Act for structures and work affecting navigable federal waters from the same aquaculture facility. The EPA has elected to act as the lead action agency and the USACE is a cooperating and co-federal agency. The EPA and USACE have determined that their proposed actions are not likely to adversely affect any listed or proposed species or designated or proposed critical habitat.

Consultation History

We received your letter requesting consultation and Biological Evaluation on August 13, 2019 and initiated consultation that day.

Project Location

The proposed aquaculture facility will be located in the Gulf of Mexico in an approximate water depth of 130 feet (ft) (40 meters [m]), 45 miles (mi) southwest of Sarasota, Florida. The applicant has submitted four potential locations to place the cage and multi-anchor swivel



(MAS) mooring system. The applicant will select one of these four potential locations based on diver-assisted assessments of the sea floor when the cage and the MAS are deployed.

Proposed Potential Project Locations

Address	Location Option	Latitude/Longitude (North American Datum 1983)	Water body
Approximately 45 mi off Sarasota, Florida	1	27.125787°N, 83.197565°W	Gulf of Mexico
	2	27.119580°N, 83.197096°W	
	3	27.115655°N, 83.19913°W	
	4	27.108763°N, 83.201529°W	

Pursuant to 50 C.F.R. § 402.02, the term action area is defined as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The EPA defined the proposed action area as a 1,000 m radius measured from the center of the MAS, based on the result of their water quality analysis.

Existing Site Conditions

The proposed facility will be placed within an area that contains unconsolidated sediments that are 3-10 ft deep. The facility’s potential locations were selected with assistance from NOAA’s National Ocean Service National Centers for Coastal Ocean Science (NCCOS). The applicant and the NCCOS conducted a site screening process over several months to identify an appropriate project site. Some of the criteria considered during the site screening process included avoidance of corals, coral reefs, submerged aquatic vegetation, hard bottom habitats, marine protected areas, marine reserves, and habitats of particular concern. This siting assessment was conducted using the Gulf AquaMapper tool developed by NCCOS.¹

Upon completion of the site screening process with the NCCOS, the applicant conducted a Baseline Environmental Survey (BES) in August 2018 based on guidance developed by the NMFS and EPA.² The BES report noted that there were no physical, biological, or archaeological features that would preclude the siting of the proposed aquaculture facility at one of the four potential locations

Project Description

The project applicant, Kampachi Farms, LLC, is proposing to operate a pilot-scale marine aquaculture facility, rearing up to 20,000 almaco jack (*Seriola rivoliana*) for approximately 12 months (with total deployment of the cage system 18 months) in federal waters of the Gulf of Mexico in 130 ft of water.

A single CopperNet offshore strength (PolarCirkel-style) fully-closed submersible fish pen will be deployed on an MAS mooring system. The engineered MAS will have up to three anchors (concrete deadweight or embedment anchors) for the mooring, with a swivel and bridle system. The cage material for the proposed project is constructed with rigid and durable materials

¹ The Gulf AquaMapper tool is available at: <https://coastalscience.noaa.gov/products-explorer/>

² The BES guidance document is available at: <https://www.fisheries.noaa.gov/content/fishery-management-plan-regulating-offshore-marine-aquaculture-gulf-mexico>

(copper mesh net with a diameter of 4 millimeter [mm] wire and 40mm x 40 mm mesh square). The mooring lines for the proposed project will be constructed of steel chain (50 mm thick) and thick rope (36 mm) that are attached to a floating cage that will rotate in the prevailing current direction; this will maintain the mooring rope and chain under tension during most times of operation. The bridle line that connects from the swivel to the cage will be encased in a rigid pipe.

The CopperNet cage design is flexible and self-adjusts to suit the constantly changing wave and current conditions. Consequently, the system can operate floating on the ocean surface or submerged within the water column of the ocean. Normal operating condition of the cage is below the water surface. The cage will be submerged and only brought to the surface for brief periods to conduct maintenance, feeding, or harvest activities due to the high-energy open ocean environment.

When a storm approaches the area, the operating team uses a valve to flood the floatation system with water, causing the entire cage array to submerge. A buoy remains on the surface, marking the net pen's position and supporting the air hose. When the pen approaches the bottom, the system will maintain the cage several meters above the sea floor. Submerged and protected from the storm above, the system is still able to rotate around the MAS and adjust to the currents. After storm events, facility staff makes the cage system buoyant, causing the system to rise back to the surface or near surface position to resume normal operational conditions. The proposed project cage will have at least one properly functioning global positioning system device to assist in locating the system in the event it is damaged or disconnected from the mooring system.

One support vessel, expected to be a 70-ft-long Pilothouse Trawler (20 ft beam and 5 ft draft) with a single 715 horsepower engine, will be tethered to the facility. Another vessel would be used for harvest and transport of the fish. The exact harvest vessel is not known; however, it is expected to be a vessel already engaged in offshore fishing activities in the Gulf.

Construction Conditions

The applicant has agreed to follow a protected species monitoring plan (PSMP), which they developed with assistance from the NMFS Protected Resources Division. The purpose of the PSMP is to provide monitoring procedures and data collection efforts for species protected under the MMPA or ESA that may be encountered at the proposed project. The PSMP also contains precautionary measures including suspending vessel transit and all surface activities (including stocking fish, harvesting operations, and routine maintenance operations) when a protected species comes within 100 m of the activity until the animal(s) leave the area. The applicant also commits to following vessel strike avoidance guidelines developed by the NMFS. (i.e., NMFS Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners; revised February 2008).

Effects Determination(s) for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Action

Species	ESA Listing Status ³	Action Agency Effect Determination	NMFS Effect Determination
Sea Turtles			
Green (North Atlantic [NA] distinct population segment [DPS])	T	NLAA	NLAA
Green (South Atlantic [SA] DPS)	T	NLAA	NLAA
Kemp's ridley	E	NLAA	NLAA
Leatherback	E	NLAA	NLAA
Loggerhead (Northwest Atlantic [NWA] DPS)	T	NLAA	NLAA
Hawksbill	E	NLAA	NE
Fish			
Smalltooth sawfish (U.S. DPS)	E	NLAA	NLAA
Nassau grouper	T	NLAA	NE
Giant manta ray	T	NLAA	NLAA
Oceanic whitetip shark	T	NLAA	NLAA
Invertebrates and Marine Plants			
Elkhorn coral (<i>Acropora palmata</i>)	T	NLAA	NE
Staghorn coral (<i>Acropora cervicornis</i>)	T	NLAA	NE
Boulder star coral (<i>Orbicella franksi</i>)	T	NLAA	NE
Mountainous star coral (<i>Orbicella faveolata</i>)	T	NLAA	NE
Lobed star coral (<i>Orbicella annularis</i>)	T	NLAA	NE
Rough cactus coral (<i>Mycetophyllia ferox</i>)	T	NLAA	NE
Pillar coral (<i>Dendrogyra cylindrus</i>)	T	NLAA	NE
Marine Mammals			
Bryde's whales	E	NLAA	NE
Blue whale	E	NLAA	NE
Fin whale	E	NLAA	NE
Sei whale	E	NLAA	NE
Sperm whale	E	NLAA	NE

There are listed species for which you made NLAA determinations for the proposed project but for which we believe there are no effects. Our rationale for that determination for each of these species is as follows:

1. Hawksbill sea turtles have very specific life history strategies, which are not supported at the project site. Hawksbill sea turtles typically inhabit inshore reef and hard bottom areas where they forage primarily on encrusting sponges. The proposed facility is located in an offshore area that contains 3 to 10-ft deep unconsolidated sediments and not near any

³ E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = no effect; NP = not present

hardbottom habitat. Consequently, we believe that Hawksbill sea turtles will not be present, and that there are no potential routes of effects on this species.

2. The absence of Nassau grouper in the Gulf of Mexico (excluding around the Florida Keys and Dry Tortugas) is well-documented by the lack of records in Florida Fish and Wildlife Conservation Commission, Fisheries Independent Monitoring data as well as in various surveys conducted by NMFS, Southeast Fisheries Science Center. Nassau grouper are not found in or close enough to the action area for there to be any potential routes of effects to this species.
3. The proposed project will be placed in an area consisting of unconsolidated sediments and not near any hardbottom. In your analysis, you concluded that water quality effects are not expected to occur outside of 30 m (0.02 mi) due to the small size of the facility. You also concluded that sedimentation from the Velella Epsilon facility is not expected outside of 1,000 m (0.62 mi), and impacts resulting from the proposed facility are likely limited to within 300 to 500 m (0.12 to 0.31 mi) from the cage. Listed corals generally occur in the Gulf only near the Florida Keys and Dry Tortugas and in the Flower Banks National Marine Sanctuary, located off the coast of Texas and Louisiana. Listed corals do not occur in or close enough to the action area for there to be any potential routes of effects on these species.
4. Two strandings on the Louisiana and Texas coast comprise the only possible record of blue whales in the Gulf of Mexico and identifications for both strandings are questionable, thus we do not believe blue whales live in the Gulf of Mexico.
5. Water depth at the project site is only 40 m deep, and the site is approximately 80+ mi from Bryde's whale biological important areas, the 100-m depth contour, and the shelf break. Sperm whales are the most abundant large cetacean in the Gulf of Mexico, found year-round in waters greater than 200 m. Sei whales also typically occur in these deeper waters. Sei whales are generally found in oceans along the 100-meter depth contour with sightings also spread over deeper water including canyons along the shelf break. Fin and sei whale do occasionally strand in the Gulf indicating they may occur, but neither is commonly observed in the waters of the Gulf of Mexico. We do not believe any of these species will occur in the action area for this project or close enough for there to be any potential routes of effects to these species.

Critical Habitat

We do not concur with your determination that the proposed action may affect hawksbill, leatherback, and loggerhead sea turtle critical habitat. The project is not located in or near designated critical habitat of these or any other species. The nearest critical habitat to the project is loggerhead nearshore nesting habitat (Units 29 and 30), more than 40 mi away from the action area.

Analysis of Potential Routes of Effects to Species

Potential routes of effects to the listed species that may occur in the action area (i.e., sea turtles [green NA and SA DPSs, loggerhead, leatherbacks, and Kemp's ridleys] and ESA-listed fish [i.e., smalltooth sawfish, giant manta rays, and oceanic whitetip sharks]⁴) include disturbance, vessel strike, entanglement, and water quality changes.

⁴ Hereafter, sea turtles and ESA-listed fish refer to these specific species.

Vessel strike

A vessel strike is a collision between any type of boat and a marine animal in the ocean. Collision with the hull, outboard motor, or propeller of a vessel can kill or injure marine animals including air-breathing whales and sea turtles as well as any other marine species when feeding, basking or even just swimming close to the surface (e.g., giant manta rays and oceanic whitetip sharks). Collisions may occur anywhere a vessel cross paths of a species. However, we have determined that the potential for a vessel strike on any listed species to result from this proposed action is discountable. The proposed project involves only two vessels. A support vessel will be present at the facility throughout the life of the project except during certain storm events or times when resupplying is necessary; a harvest vessel (expected to be a vessel already engaged in offshore fishing in the Gulf) will be used to transport the fish, once grown, to land. Vessels are expected to follow the vessel strike and avoidance measures that have been developed by NMFS⁵. A collision between any specific vessel and marine animal is extremely unlikely to occur. For example, when using the conservative mean estimate of a sea turtle strike every 193 years (range of 135-250 years) per vessel, it would require a moderately-sized marina project (e.g., ~200 new vessels introduced to an area) to potentially result in a sea turtle take in any single year (Barnette 2018⁶). Given the limited vessel activity and duration of the project, a vessel strike is extremely unlikely.

Disturbance

ESA-listed fish and sea turtles may experience disturbance by stress via a startled reaction should they encounter the proposed facility, including the cage associated and the support vessel and/or harvest vessel or associated noise (e.g., vessel engine or barge generator), when moving through the area. A behavioral reaction could range from the animal approaching and investigating the facility to avoidance and moving away from the area. A potential source of disturbance from the proposed aquaculture facility would be vessel engine and barge generator noise. ESA-listed fish and sea turtles may also be attracted to aquaculture facilities as potential sources of food, shelter, and/or rest. However, any stress and behavioral effects on ESA-listed fish and sea turtles from disturbance are expected to be insignificant. The facility is not in an area known to be a hot spot or high-use area for any important activities (e.g., feeding, reproducing) of the sea turtle or ESA-listed fish species. Also, because this is a pilot study with only one cage in the open ocean, the proposed project site is small (each potential site <8 square kilometers) and will in no way limit movement or ability of a species to avoid the area or navigate through the area. As a result, disturbance from human activities and equipment and vessel operation resulting from the proposed action is expected to have only insignificant effects on ESA-listed fish and sea turtles.

Entanglement/Entrapment

The cage, mooring lines, and bridle line from the proposed project may pose an entanglement and an entrapment risk to ESA listed fish and sea turtles. Entanglements occur when lines, netting, or other man-made materials become wrapped around the body (e.g., flipper, fin) of the

⁵ NMFS. Vessel Strike Avoidance Measures and Reporting for Mariners NOAA Fisheries Service, Southeast Region, February 2008. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, Saint Petersburg, Florida.
<https://www.fisheries.noaa.gov/southeast/consultations/regulations-policies-and-guidance>

⁶ Barnette, M. C. 2018. Threats and Effects Analysis for Protected Resources on Vessel Traffic Associated with Dock and Marina Construction. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Saint Petersburg, Florida.

animal. Entrapment can occur when an animal becomes restrained or stuck in man-made structure and cannot escape. However, we believe the effects to sea turtles or ESA listed fish from entanglement will be discountable because of how the cage will be constructed and deployed. The risk of sea turtles and ESA listed fish being entangled or entrapped is greatly reduced by using rigid cage materials and by keeping all lines taut. The cage and moorings for the proposed project are constructed with rigid and durable materials, and the mooring lines will be constructed of steel chain and thick rope that will be maintained under tension by the ocean currents during most times of operation. For example, the lines would likely remain taut even as the currents shift because of the weight of the chain and rope creating a negative buoyancy on the facility anchorage lines. The cage, even in storm conditions, will be at least several meters from the sea floor, allowing safe passage under the cage. Additionally, the bridle line that connects from the swivel to the cage will be encased in a rigid pipe. The limited number of vertical mooring lines (3) and the duration of cage deployment (less than 18 months) will also reduce the risk of potential entanglement. Because of the proposed project operations and duration, we expect that the effects of possible entanglement to be discountable.

Water quality

Sea turtles and ESA-listed fish species may be affected by water quality/habitat degradation if it leads to reduced habitat quality. However, we believe any potential water quality effects on ESA-listed fish and sea turtles from the proposed action will be insignificant. Effluent from the proposed action can adversely affect water quality, sea floor sediment composition, and benthic fauna through the additions of uneaten feed, ammonia excretions, and fish feces from the increased fish biomass. The release of nutrients, reductions of dissolved oxygen, and the accumulation of sediments under certain aquaculture operations lead to eutrophication and degradation of benthic communities. The EPA evaluated the proposed action's potential impacts to water quality and impacts of organic enrichment to the seafloor and benthic communities. The EPA also considered the potential water quality impacts from chemical spills, drugs, cleaning, and solid wastes. The discharge of wastewater from the proposed project are expected to have a minor impact on water quality due to factors concerning the low fish biomass produced; the relatively small amounts of pollutants discharged; depth of the sea floor; and current velocities at the proposed action area. The EPA anticipates that the proposed activity would add relatively small amounts of nutrient wastes (nitrogen, phosphorus, particulate organic carbon, and solids) to the ocean in the immediate vicinity of the proposed action area. The facility's effluent is expected to undergo rapid dilution from the prevailing current; constituents will be difficult to detect within short distances from the cage. Per EPA's analysis, (1) water quality effects are not expected to occur more than 30 m (0.02 mi) away from the cage site due to the small size of the facility, and (2) sedimentation from the Vellella Epsilon facility is not expected to go more than 1,000 m (0.62 mi) from the cage, and impacts resulting from the proposed facility are likely limited to within 300 to 500 m (0.12 to 0.31 mi) from the cage. The discharges authorized by the proposed NPDES permit represent a small incremental contribution of pollutants and will have an insignificant affect any on the ESA-listed fish or sea turtles in the action area.

Conclusion

Because all potential project effects to listed species were found to be discountable, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species under NMFS's purview. This concludes your consultation responsibilities under the ESA for species under NMFS's purview. Consultation must be reinitiated if a take occurs or new

information reveals effects of the action not previously considered, or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. NMFS's findings on the project's potential effects are based on the project description in this response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

In your letter to us, you also initiated consultation pursuant to the Fish and Wildlife Coordination Act (FWCA). NMFS's Southeast Regional Office, Habitat Conservation Division reviewed the information in the Draft Biological Evaluation pursuant to the FWCA, and based on that review, we anticipate any adverse effects that might occur on marine and anadromous fishery resources would be minimal. Therefore, we do not object to issuance of the permit per the FWCA.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Jennifer Lee, Fishery Biologist, at (727) 551-5778 or by email at Jennifer.lee@noaa.gov.

Sincerely,



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David Bernhart
Assistant Regional Administrator
for Protected Resources

cc: F/SER – J. Beck
F/SER31 – J. Lee

File: 1514-22.k

Enclosure 4 - Additional analysis conducted by NMFS after the 2022 NPDES permit was issued dated August 26, 2022



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, Florida 33701-5505
<https://www.fisheries.noaa.gov/region/southeast>

08/26/2022

F/SER31: JJS, LEF, JLL
SERO-2019-02205; SERO-2021-02842

Christopher B. Thomas
Chief, Permitting and Grants Branch
U.S. Environmental Protection Agency
Region 4
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia, 30303-8960

John Fellows
Acting Chief, Tampa Permits Section
Jacksonville District Corps of Engineers (USACE)
Department of the Army
10117 Princess Palm Drive, Suite 120
Tampa, FL 33610-8302

Jonathan Pennock, Ph.D.
Director
NOAA National Sea Grant College Program
1315 East West Highway
Silver Springs, MD 20910

Dear Mr. Thomas, Mr. Fellows, and Mr. Pennock:

We, the National Marine Fisheries Service (NMFS), are amending our letter of concurrence (LOC) that we provided to you pursuant to Section 7 of the Endangered Species Act (ESA) for the following action, in order to address information we considered, but did not document in the original LOC. In reviewing the existing consultation when considering the late-arriving action agency, NOAA National Sea Grant College Program, we noted that we did not fully document all of our considerations and supporting rationale for our LOC. In order to address information we considered, but did not include documentation on in the original LOC, we are now amending the consultation to include relevant additional information related to the project's potential impacts. This amended LOC does not change our determination that the Velella Epsilon project is not likely to adversely affect any listed or proposed species or designated or proposed critical habitat.



Permit Numbers	Applicant	SERO Numbers	Project Types
NPDES FL0A0000I, SAJ- 20 17-03488	Kampachi Farms, LLC (now Ocean Era, Inc.	SERO-2019- 02205, SERO- 2021-02842	Offshore Cage Aquaculture, NPDES permit, Section 10 permit, Project Funding

Consultation History

On August 13, 2019, the EPA requested informal consultation on EPA’s proposed issuance of a National Pollutant Discharge Elimination System (NPDES) permit to Kampachi Farms, LLC (now, Ocean Era, Inc.) for the point-source discharge of pollutants from their proposed Velella Epsilon marine aquaculture facility. In the same request, the USACE requested informal consultation on the proposed issuance of a Department of Army permit pursuant to Section 10 of the Rivers and Harbors Act for structures and work affecting navigable federal waters from the same aquaculture facility. The EPA included a biological evaluation with their request. On September 30, 2019, we concurred with the EPA and USACE determinations that the Velella Epsilon project is not likely to adversely affect any listed or proposed species or designated or proposed critical habitat in an LOC (SERO-2019-02205-see Appendix 1).

On October 21, 2021, NOAA’s Sea Grant Program requested ESA Section 7 consultation on their proposed funding for the Velella Epsilon marine aquaculture project (Velella Epsilon) in partnership with Neil Sims of Ocean Era, Inc., University of Florida, and Dr. Daniel Benetti and the University of Miami. On July 14, 2022, we determined that NOAA Sea Grant’s proposed funding was within the scope of the original action and that a separate consultation was not warranted. Instead, we issued a letter to NOAA Sea Grant as a late arriving action agency noting that their consultation obligation for funding of the Velella Epsilon project was fulfilled by the previous consultation.

Project Location

Address	Location Option	Latitude/Longitude (North American Datum 1983)	Water body
Approximately 45 mi off Sarasota, Florida	1	27.125787°N, 83.197565°W	Gulf of Mexico
	2	27.119580°N, 83.197096°W	
	3	27.115655°N, 83.19913°W	
	4	27.108763°N, 83.201529°W	

Pursuant to 50 C.F.R. § 402.02, the term action area is defined as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action”. In the original LOC, we defined the proposed action area as a 1,000 m radius measured

from the center of the MAS, based on the result of the water quality analysis. We inadvertently omitted from our proposed action area definition the route that project vessels will take between the marina and the farm location. Therefore, we are redefining the action area in this amendment to the original LOC to include any vessel route in addition to the radius around the project location. As explained below, the expansion of the action area does not alter our determination in the original LOC issued to the EPA and USACE, that the proposed aquaculture facility is not likely to adversely affect listed species.

Existing Site Conditions

The project siting process and the site conditions can be found in the original consultation, SERO-2019-02205 (Appendix 1) which we incorporated by reference.

Project Description

The project applicant, Ocean Era, Inc. (formerly, Kampachi Farms, LLC), is proposing to operate a pilot-scale marine aquaculture facility, rearing up to 20,000 almaco jack (*Seriola rivoliana*) for approximately 12 months (with total deployment of the cage system - 18 months) in federal waters of the Gulf of Mexico, in 130 ft of water.

Specific construction and operation details of the project can be found in the original LOC, SERO-2019-02205 (Appendix 1) incorporated by reference.

Construction Conditions

Ocean Era, Inc. agreed to follow a protected species monitoring plan (PSMP), which they developed with assistance from my staff. The purpose of the PSMP is to provide monitoring procedures and data collection efforts for species protected under the MMPA or ESA that may be encountered at the proposed project. The PSMP also contains precautionary measures including suspending vessel transit and all surface activities (including stocking fish, harvesting operations, and routine maintenance operations) when a protected species comes within 100 m of the activity, until the animal(s) leave the area. Ocean Era, Inc. also committed to following vessel strike avoidance guidelines developed by the NMFS. (i.e., NMFS Southeast Region Vessel Strike Avoidance Measures; revised February 2021; https://media.fisheries.noaa.gov/2021-06/Vessel_Strike_Avoidance_Measures.pdf?null).

Effects Determination(s) for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Action. Please note abbreviations used in the table below: E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = no effect.

Species	ESA Listing Status	Action Agency Effect Determination	NMFS Effect Determination
Sea Turtles			
Green (North Atlantic [NA] distinct population segment [DPS])	T	NLAA	NLAA
Green (South Atlantic [SA] DPS)	T	NLAA	NLAA
Kemp's ridley	E	NLAA	NLAA
Leatherback	E	NLAA	NLAA
Loggerhead (Northwest Atlantic [NWA] DPS)	T	NLAA	NLAA
Hawksbill	E	NE	NE
Fish			
Smalltooth sawfish (U.S. DPS)	E	NLAA	NLAA
Nassau grouper	T	NE	NE
Giant manta ray	T	NLAA	NLAA
Oceanic whitetip shark	T	NLAA	NLAA
Invertebrates and Marine Plants			
Elkhorn coral (<i>Acropora palmata</i>)	T	NLAA	NE
Staghorn coral (<i>Acropora cervicornis</i>)	T	NLAA	NE
Boulder star coral (<i>Orbicella franksi</i>)	T	NLAA	NE
Mountainous star coral (<i>Orbicella faveolata</i>)	T	NLAA	NE
Lobed star coral (<i>Orbicella annularis</i>)	T	NLAA	NE
Rough cactus coral (<i>Mycetophyllia ferox</i>)	T	NLAA	NE
Pillar coral (<i>Dendrogyra cylindrus</i>)	T	NLAA	NE
Marine Mammals			
Rice's whale	E	NLAA	NE
Blue whale	E	NLAA	NE
Fin whale	E	NLAA	NE
Sei whale	E	NLAA	NE
Sperm whale	E	NLAA	NE

Our species determinations, including our rationale for listed species for which you made NLAA determinations for the proposed project but for which we believe there are no effects, remain unchanged from the original LOC, even after considering our revised definition of the action area, and are incorporated by reference (Appendix 1).

Critical Habitat

The project is not located in designated critical habitat, and there are no potential routes of effect to any designated critical habitat.

Analysis of Potential Routes of Effects to Species

Potential routes of effects to the listed species that may occur in the action area (see table above) and that were documented in our original LOC include: disturbance, vessel strike, entanglement, and water quality changes. Analysis of those potential routes of effects are referenced in the original LOC, SERO-2019-02205 (Appendix 1), and are incorporated herein by reference.

Due to our expanded definition of the action area, this amended consultation adds additional analysis of the potential route of effects to species from vessel strikes that may occur during the transit of project vessels between where they are docked and the project area. In addition, this amended LOC addresses the potential risk of vessel strike effects from other non-project vessels due to a potential increase in recreational and commercial fishing traffic near the facility, the potential effects of the aquaculture facility acting as a fish aggregating device (FAD) leading to feeding or behavioral changes, increased predation, and increased bycatch; and the potential risk of harmful algal blooms from the project on listed species. This additional analysis does not change our finding that the project is not likely to adversely affect any listed species. Instead we document additional support for our finding.

Vessel strike risks:

As noted in the original LOC, vessel strikes between a marine animal and a vessel can kill or injure the animal, including air-breathing whales and sea turtles as well as any other marine species, when feeding, basking or swimming close to the surface (e.g., giant manta rays and oceanic whitetip sharks). Smalltooth sawfish are primarily demersal and rarely would be at risk from moving vessels. Therefore, we expect any vessel traffic effects on smalltooth sawfish to be discountable. The oceanic whitetip is a pelagic species, and may be more vulnerable to vessel strike than demersal species. While there is anecdotal information indicating vessel strikes on pelagic shark species do occur (e.g., Barnette, pers. obs.), such as when sharks are basking or cruising near the surface, strikes on this particular shark species are anticipated to be highly unlikely due to their preference for offshore pelagic waters where vessel traffic is more diffuse.

The proposed project involves only two vessels - a support vessel and a harvest vessel. The support vessel will be present at the facility throughout the life of the project except during certain storm events or times when resupplying is necessary. The harvest vessel (expected to be a vessel already engaged in offshore fishing in the Gulf) will be used to transport the fish, once grown, to land and as such, will only be present on-site when harvesting occurs. As stated in the original LOC, we do not believe any of the listed whale species that may be present in the Gulf of Mexico will be close enough to the facility location of this project for there to be any potential routes of effects to these species. For the same reasons explained in the original LOC, we also conclude that these whales will not occur close enough to the expanded action area, which includes the route from shore to the farm location, of this project for there to be any potential routes of effects. For non-demersal ESA-listed fish and sea turtles that may occur in the expanded action area and may be affected, any adverse effects from project vessels are still extremely unlikely to occur, due to the small number of vessels associated with farm activities and the low number of trips that will take place between shore and the farm.

The original LOC omitted discussing the risk of vessel strikes due to a potential increase in recreational and commercial fishing traffic to the area due to the project acting as a fish aggregation device (FAD). The addition of one aquaculture net pen may introduce new fishing

vessels to the area around the farm but those fishing vessels would likely be the result of a shift in current fishing vessel distribution from areas where vessels may currently aggregate. While it is difficult to estimate the increase in fishing vessels near the farm, the number of vessels that will be drawn to the farm is limited due to the distance the proposed project will be from shore (45 miles). The threat that fishing vessels present to ESA-listed fish and manta rays is not constant. It is influenced by vessel type, vessel speed, and environmental conditions such as sea state and visibility. A collision between any specific vessel and marine animal is extremely unlikely to occur (Barnette 2018). For example, when using the conservative mean estimate of a sea turtle strike every 193 years (range of 135-250 years) per vessel, it would require a moderately-sized marina project (e.g., ~200 new vessels introduced to an area) to potentially result in one sea turtle take in any single year (Barnette 2018). While there may be some shift in fishing effort to the farm location and an increase in fishing vessels near the farm, the effect of vessel strikes on listed species is still extremely unlikely to occur.

Other Potential Risks from the Farm Acting as a FAD:

There are several other potential risks to listed species from the farm, potentially acting as a FAD. These include changes in trophic ecosystem effects leading to feeding/behavioral changes, potential increased predation on ESA-listed species, and potential aggregation of fishing effort around the farm leading to a potential increase in bycatch of ESA-listed species.

As pointed out in Callier et al (2018), an aquaculture facility has the potential to act as a FAD and attract fish to the area to feed on the excess fish food or feces that will be discharged from the fish cage. A finfish cage acts as a fish aggregating device (FAD) by providing structure in the pelagic environment but has increased food availability compared to traditional FAD's (e.g. artificial reefs), (Dempster et al. 2002). These structures provide shade, which create shadow areas where zooplankton become more visible to feeding fish; substrate for egg laying; act as a schooling companion, providing spatial reference for fish; shelter for small fish from predators; substrate for plant and animal growth; and as potential cleaning stations for pelagic fish (Beveridge, 1984).

What species may be attracted to offshore aquaculture is dependent on the farm location and varies by season. As there are no other fish cages in the Gulf of Mexico, the only other comparable structures offshore are oil platforms. Oil platforms are known to attract clupeids, engraulids, synodontids, bennids, and pomacentrids, which is expected, as those are common species around hard bottom habitat in the Gulf of Mexico (Lindquist et al. 2005). Those species are aggregating at the oil platform to either use the structure as a habitat, refuge, or feed on organisms that settle and grow on the structure itself. The assemblage of species that will be attracted to the Vellella facility may be different, as fish will be attracted to not only the structure, but to the discharge from the net pen. Oil platforms are more likely to attract herbivorous fish and benthic carnivores, while this project is more likely to also attract particulate matter feeders such as rays and pagellus fishes (Tuya et al. 2006).

The impact of the attraction of fish to the farm facility is difficult to assess, as the attraction of particulate matter feeders may lessen the amount of discharge by reducing the amount of organic material that is released into the environment (Uglem et al. 2008). Sea turtles, in particular, are not known to feed on fish or particulate matter, such as what will be discharged from the farm location, nor do they feed on any of the fishes that will be attracted to the farm. Giant manta rays

and oceanic whitetip sharks may be attracted to the farm location to feed on fish or farm discharge. Regardless, based on this proposed one-cage project, the changes in the trophic ecosystem around the farm are likely to be minimal; that is, we expect any feeding or behavioral effects to ESA-listed species that may be attracted to the area to be too small to be meaningfully measured or detected, and effects insignificant. Since this project is limited to one fish cage, there is no evidence that the cage acting as a FAD will have any significant effect on any of the listed species in the table above.

Due to the increase in fish around the fish cage, there is a possibility that the farm will attract predators such as sharks or killer whales, which could prey on listed sea turtles or manta rays. However, the Gulf of Mexico killer whale population is very small (a 2009 survey estimated the population at 28 individuals), and they are primarily found in a mean depth of 1,900m (Maze-Foley and Mullin 2006). Oil platforms in the Gulf of Mexico are known to attract tiger sharks due to them acting as artificial reefs and attracting high densities of fish (Ajemiam et al. 2020). However, there is some limited evidence that tiger sharks attracted to fish farms are transient and are not found to be permanently aggregating around open ocean aquaculture farm locations (Papastamatiou et al. 2011). As oceanic whitetip sharks are highly mobile and opportunistic predators, they may be attracted to the farm location, but there is little evidence that the addition of one fish cage will adversely impact their foraging behavior.

The attraction of sharks to the farm location may have some impact on listed sea turtles and giant manta rays. Giant manta rays and sea turtles both have been observed with shark bites. A recent study on the east coast of Florida found that only 6.8% of identifiable manta rays had shark bites and hypothesized that mantas may be exhibiting some preference for areas with low levels of predators (Pate and Marshall 2020). Generally, giant manta mortality due to shark attacks is thought to be relatively low (Bucair et al. 2021). The hard sea turtle carapace makes large sea turtles more resilient to shark predation, and Stacy et al. (2021) found that the majority (80%) of sea turtle stranding's with shark-related injuries were due to sharks preying on already deceased sea turtles. While there is a risk of sea turtle and manta ray predation by sharks attracted to the project location, due to the small size of the farm and the transient nature of sharks, we believe this is extremely unlikely to occur.

Recreational and commercial fishermen may fish near the cage facility, as they do near other structures (e.g., natural and artificial reefs) while fishing for species managed under federal fisheries management plans (FMPs) (e.g., Gulf of Mexico Reef Fish FMP, coastal migratory pelagic resources FMP). Although the facility may aggregate some fish and fishing activity, we do not expect there to be a measurable increased risk of ESA-listed species bycatch attributed to the proposed aquaculture farm relative to that considered in our biological opinions on federal fisheries. As with vessel traffic, we believe that the proposed farm would only potentially shift current fishing vessel distribution from areas where vessels may currently aggregate.

Risks from Potential Harmful Algal Blooms:

Listed species may be adversely affected indirectly if the proposed facility leads to an increase in harmful algal blooms or red tide events due to the toxic nature of red tide to marine organisms. However, the best available information on the potential effects of the proposed facility do not indicate such will occur from this offshore small one cage project. Phytoplankton blooms are primarily natural events and an important part of the annual cycle of phytoplankton growth, but

some blooms are associated with ‘harmful events’, ranging from ecosystem disturbance to serious threats to human health. Phytoplankton blooms can vary seasonally and are predominantly due to local environmental conditions on land. Nutrient input from land into a marine system occurs via runoff; flooding of a major river basin which re-suspends nutrients; and local wind and rainfall, which set up oceanographic conditions, such as water-column stability, that may promote or exacerbate algal growth. Although nutrient enrichment from finfish farm waste has been associated with increased phytoplankton growth and the occurrence of algal blooms, these concerns are mainly for farms located in shallow, poorly flushed sites that are sensitive to nutrient additions.

The Vellella Epsilon project has stringent monitoring requirements for discharge required by the EPA to protect water quality. The overall pollutant loading of the project is expected to be minimal given the small production levels from one cage. Additionally, it is not expected that aquaculture-related pollutants will be measurable in the water within 5-10 meters from the project (US EPA 2020). There is very little evidence of aquaculture farms directly being attributable to HABs. Water quality and phytoplankton monitoring of finfish farm sites in Ireland and Chile found no evidence that salmon aquaculture caused phytoplankton blooms (Hensey, 1992; Bushmann *et al.*, 1996). A study in British Columbia demonstrated that salmon farms did not increase the food for mussels grown adjacent to the farms. Additionally, there was no evidence of direct contribution of nutrients in the form of fish feed or feces and no indirect contribution of phytoplankton from nitrogen enrichment (Taylor *et al.*, 1992). Similarly, in the Bay of Fundy, Martin *et al.* (1999) could find no connection between fish farming and the occurrence of HABs. Finally, Price *et al.* 2015, found that modern operating conditions have minimized impacts of individual fish farms on marine water quality and the effects on dissolved oxygen and turbidity were minimized through better management. Based on the modeling done by the EPA for this project, we believe one cage will not produce enough discharge in a concentrated area to lead to a harmful algal bloom, or exacerbate existing blooms that have been occurring along the Florida coastline. Therefore, we find the effects of potential HABs or red tide events as a result of this project on listed species to be discountable.

Conclusion

Although the action area was expanded and additional analysis on the effects to listed species was conducted, this did not change the determination of the original LOC (SERO-2019-02205–Appendix 1). Because all potential project effects to listed species were found to be discountable, insignificant, or beneficial, we concur with your assessment that the proposed action is also not likely to adversely affect any listed species or designated critical habitat.

This concludes your consultation responsibilities under the ESA for species under NMFS’s purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. NMFS’s findings on the project’s potential effects are based on the project description in this response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Joe Shields, Marine Habitat Specialist, at joseph.shields@noaa.gov or Lindsey Feldman, Marine Habitat Specialist, at lindsey.feldman@noaa.gov.

Sincerely,



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David Bernhart
Assistant Regional Administrator
for Protected Resources

Files: 1514-22.k, 1514-22.e, 1514-22.f.4
Appendix

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APPENDIX 1: 09/30/2019 Letter of Concurrence



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
 Southeast Regional Office
 263 13th Avenue South
 St. Petersburg, Florida 33701-5505
<https://www.fisheries.noaa.gov/region/southeast>

09/30/2019

F/SER31:JLL
 SER-2019-02205

Christopher B. Thomas
 Chief, Permitting and Grants Branch
 U.S. Environmental Protection Agency
 Region 4
 Atlanta Federal Center
 61 Forsyth Street
 Atlanta, Georgia, 30303-8960

Dear Mr. Thomas:

This letter responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act (ESA) and the Fish and Wildlife Coordination Act (FWCA) for the following action.

Project Name	Applicant(s)	SER Number	Project Type
Veella Epsilon Marine Aquaculture Facility	Kampachi Farms, LLC	SER0-2019-02205	Offshore Cage Aquaculture, NPDES permit, Section 10 permits

Your request is on behalf of the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers Jacksonville District (USACE), the two federal agencies responsible for permitting aquaculture operations in federal waters of the Gulf of Mexico. The EPA is proposing to issue a National Pollutant Discharge Elimination System (NPDES) permit to Kampachi Farms, LLC for the point-source discharge of pollutants from their proposed Veella Epsilon marine aquaculture facility. The USACE is proposing to issue a Department of Army permit pursuant to Section 10 of the Rivers and Harbors Act for structures and work affecting navigable federal waters from the same aquaculture facility. The EPA has elected to act as the lead action agency and the USACE is a cooperating and co-federal agency. The EPA and USACE have determined that their proposed actions are not likely to adversely affect any listed or proposed species or designated or proposed critical habitat.

Consultation History

We received your letter requesting consultation and Biological Evaluation on August 13, 2019 and initiated consultation that day.

Project Location

The proposed aquaculture facility will be located in the Gulf of Mexico in an approximate water depth of 130 feet (ft) (40 meters [m]), 45 miles (mi) southwest of Sarasota, Florida. The applicant has submitted four potential locations to place the cage and multi-anchor swivel



(MAS) mooring system. The applicant will select one of these four potential locations based on diver-assisted assessments of the sea floor when the cage and the MAS are deployed.

Proposed Potential Project Locations

Address	Location Option	Latitude/Longitude (North American Datum 1983)	Water body
Approximately 45 mi off Sarasota, Florida	1	27.125787°N, 83.197565°W	Gulf of Mexico
	2	27.119580°N, 83.197096°W	
	3	27.115655°N, 83.19913°W	
	4	27.108763°N, 83.201529°W	

Pursuant to 50 C.F.R. § 402.02, the term action area is defined as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The EPA defined the proposed action area as a 1,000 m radius measured from the center of the MAS, based on the result of their water quality analysis.

Existing Site Conditions

The proposed facility will be placed within an area that contains unconsolidated sediments that are 3-10 ft deep. The facility’s potential locations were selected with assistance from NOAA’s National Ocean Service National Centers for Coastal Ocean Science (NCCOS). The applicant and the NCCOS conducted a site screening process over several months to identify an appropriate project site. Some of the criteria considered during the site screening process included avoidance of corals, coral reefs, submerged aquatic vegetation, hard bottom habitats, marine protected areas, marine reserves, and habitats of particular concern. This siting assessment was conducted using the Gulf AquaMapper tool developed by NCCOS.¹

Upon completion of the site screening process with the NCCOS, the applicant conducted a Baseline Environmental Survey (BES) in August 2018 based on guidance developed by the NMFS and EPA.² The BES report noted that there were no physical, biological, or archaeological features that would preclude the siting of the proposed aquaculture facility at one of the four potential locations

Project Description

The project applicant, Kampachi Farms, LLC, is proposing to operate a pilot-scale marine aquaculture facility, rearing up to 20,000 almaco jack (*Seriola rivoliana*) for approximately 12 months (with total deployment of the cage system 18 months) in federal waters of the Gulf of Mexico in 130 ft of water.

A single CopperNet offshore strength (PolarCirkel-style) fully-closed submersible fish pen will be deployed on an MAS mooring system. The engineered MAS will have up to three anchors (concrete deadweight or embedment anchors) for the mooring, with a swivel and bridle system. The cage material for the proposed project is constructed with rigid and durable materials

¹ The Gulf AquaMapper tool is available at: <https://coastalscience.noaa.gov/products-explorer/>

² The BES guidance document is available at: <https://www.fisheries.noaa.gov/content/fishery-management-plan-regulating-offshore-marine-aquaculture-gulf-mexico>

(copper mesh net with a diameter of 4 millimeter [mm] wire and 40mm x 40 mm mesh square). The mooring lines for the proposed project will be constructed of steel chain (50 mm thick) and thick rope (36 mm) that are attached to a floating cage that will rotate in the prevailing current direction; this will maintain the mooring rope and chain under tension during most times of operation. The bridle line that connects from the swivel to the cage will be encased in a rigid pipe.

The CopperNet cage design is flexible and self-adjusts to suit the constantly changing wave and current conditions. Consequently, the system can operate floating on the ocean surface or submerged within the water column of the ocean. Normal operating condition of the cage is below the water surface. The cage will be submerged and only brought to the surface for brief periods to conduct maintenance, feeding, or harvest activities due to the high-energy open ocean environment.

When a storm approaches the area, the operating team uses a valve to flood the floatation system with water, causing the entire cage array to submerge. A buoy remains on the surface, marking the net pen's position and supporting the air hose. When the pen approaches the bottom, the system will maintain the cage several meters above the sea floor. Submerged and protected from the storm above, the system is still able to rotate around the MAS and adjust to the currents. After storm events, facility staff makes the cage system buoyant, causing the system to rise back to the surface or near surface position to resume normal operational conditions. The proposed project cage will have at least one properly functioning global positioning system device to assist in locating the system in the event it is damaged or disconnected from the mooring system.

One support vessel, expected to be a 70-ft-long Pilothouse Trawler (20 ft beam and 5 ft draft) with a single 715 horsepower engine, will be tethered to the facility. Another vessel would be used for harvest and transport of the fish. The exact harvest vessel is not known; however, it is expected to be a vessel already engaged in offshore fishing activities in the Gulf.

Construction Conditions

The applicant has agreed to follow a protected species monitoring plan (PSMP), which they developed with assistance from the NMFS Protected Resources Division. The purpose of the PSMP is to provide monitoring procedures and data collection efforts for species protected under the MMPA or ESA that may be encountered at the proposed project. The PSMP also contains precautionary measures including suspending vessel transit and all surface activities (including stocking fish, harvesting operations, and routine maintenance operations) when a protected species comes within 100 m of the activity until the animal(s) leave the area. The applicant also commits to following vessel strike avoidance guidelines developed by the NMFS. (i.e., NMFS Southeast Region Vessel Strike Avoidance Measures and Reporting for Mariners; revised February 2008).

Effects Determination(s) for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Action

Species	ESA Listing Status ³	Action Agency Effect Determination	NMFS Effect Determination
Sea Turtles			
Green (North Atlantic [NA] distinct population segment [DPS])	T	NLAA	NLAA
Green (South Atlantic [SA] DPS)	T	NLAA	NLAA
Kemp's ridley	E	NLAA	NLAA
Leatherback	E	NLAA	NLAA
Loggerhead (Northwest Atlantic [NWA] DPS)	T	NLAA	NLAA
Hawksbill	E	NLAA	NE
Fish			
Smalltooth sawfish (U.S. DPS)	E	NLAA	NLAA
Nassau grouper	T	NLAA	NE
Giant manta ray	T	NLAA	NLAA
Oceanic whitetip shark	T	NLAA	NLAA
Invertebrates and Marine Plants			
Elkhorn coral (<i>Acropora palmata</i>)	T	NLAA	NE
Staghorn coral (<i>Acropora cervicornis</i>)	T	NLAA	NE
Boulder star coral (<i>Orbicella franksi</i>)	T	NLAA	NE
Mountainous star coral (<i>Orbicella faveolata</i>)	T	NLAA	NE
Lobed star coral (<i>Orbicella annularis</i>)	T	NLAA	NE
Rough cactus coral (<i>Mycetophyllia ferox</i>)	T	NLAA	NE
Pillar coral (<i>Dendrogyra cylindrus</i>)	T	NLAA	NE
Marine Mammals			
Bryde's whales	E	NLAA	NE
Blue whale	E	NLAA	NE
Fin whale	E	NLAA	NE
Sei whale	E	NLAA	NE
Sperm whale	E	NLAA	NE

There are listed species for which you made NLAA determinations for the proposed project but for which we believe there are no effects. Our rationale for that determination for each of these species is as follows:

1. Hawksbill sea turtles have very specific life history strategies, which are not supported at the project site. Hawksbill sea turtles typically inhabit inshore reef and hard bottom areas where they forage primarily on encrusting sponges. The proposed facility is located in an offshore area that contains 3 to 10-ft deep unconsolidated sediments and not near any

³ E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = no effect; NP = not present

hardbottom habitat. Consequently, we believe that Hawksbill sea turtles will not be present, and that there are no potential routes of effects on this species.

2. The absence of Nassau grouper in the Gulf of Mexico (excluding around the Florida Keys and Dry Tortugas) is well-documented by the lack of records in Florida Fish and Wildlife Conservation Commission, Fisheries Independent Monitoring data as well as in various surveys conducted by NMFS, Southeast Fisheries Science Center. Nassau grouper are not found in or close enough to the action area for there to be any potential routes of effects to this species.
3. The proposed project will be placed in an area consisting of unconsolidated sediments and not near any hardbottom. In your analysis, you concluded that water quality effects are not expected to occur outside of 30 m (0.02 mi) due to the small size of the facility. You also concluded that sedimentation from the Velella Epsilon facility is not expected outside of 1,000 m (0.62 mi), and impacts resulting from the proposed facility are likely limited to within 300 to 500 m (0.12 to 0.31 mi) from the cage. Listed corals generally occur in the Gulf only near the Florida Keys and Dry Tortugas and in the Flower Banks National Marine Sanctuary, located off the coast of Texas and Louisiana. Listed corals do not occur in or close enough to the action area for there to be any potential routes of effects on these species.
4. Two strandings on the Louisiana and Texas coast comprise the only possible record of blue whales in the Gulf of Mexico and identifications for both strandings are questionable, thus we do not believe blue whales live in the Gulf of Mexico.
5. Water depth at the project site is only 40 m deep, and the site is approximately 80+ mi from Bryde's whale biological important areas, the 100-m depth contour, and the shelf break. Sperm whales are the most abundant large cetacean in the Gulf of Mexico, found year-round in waters greater than 200 m. Sei whales also typically occur in these deeper waters. Sei whales are generally found in oceans along the 100-meter depth contour with sightings also spread over deeper water including canyons along the shelf break. Fin and sei whale do occasionally strand in the Gulf indicating they may occur, but neither is commonly observed in the waters of the Gulf of Mexico. We do not believe any of these species will occur in the action area for this project or close enough for there to be any potential routes of effects to these species.

Critical Habitat

We do not concur with your determination that the proposed action may affect hawksbill, leatherback, and loggerhead sea turtle critical habitat. The project is not located in or near designated critical habitat of these or any other species. The nearest critical habitat to the project is loggerhead nearshore nesting habitat (Units 29 and 30), more than 40 mi away from the action area.

Analysis of Potential Routes of Effects to Species

Potential routes of effects to the listed species that may occur in the action area (i.e., sea turtles [green NA and SA DPSs, loggerhead, leatherbacks, and Kemp's ridleys] and ESA-listed fish [i.e., smalltooth sawfish, giant manta rays, and oceanic whitetip sharks]⁴) include disturbance, vessel strike, entanglement, and water quality changes.

⁴ Hereafter, sea turtles and ESA-listed fish refer to these specific species.

Vessel strike

A vessel strike is a collision between any type of boat and a marine animal in the ocean. Collision with the hull, outboard motor, or propeller of a vessel can kill or injure marine animals including air-breathing whales and sea turtles as well as any other marine species when feeding, basking or even just swimming close to the surface (e.g., giant manta rays and oceanic whitetip sharks). Collisions may occur anywhere a vessel cross paths of a species. However, we have determined that the potential for a vessel strike on any listed species to result from this proposed action is discountable. The proposed project involves only two vessels. A support vessel will be present at the facility throughout the life of the project except during certain storm events or times when resupplying is necessary; a harvest vessel (expected to be a vessel already engaged in offshore fishing in the Gulf) will be used to transport the fish, once grown, to land. Vessels are expected to follow the vessel strike and avoidance measures that have been developed by NMFS⁵. A collision between any specific vessel and marine animal is extremely unlikely to occur. For example, when using the conservative mean estimate of a sea turtle strike every 193 years (range of 135-250 years) per vessel, it would require a moderately-sized marina project (e.g., ~200 new vessels introduced to an area) to potentially result in a sea turtle take in any single year (Barnette 2018⁶). Given the limited vessel activity and duration of the project, a vessel strike is extremely unlikely.

Disturbance

ESA-listed fish and sea turtles may experience disturbance by stress via a startled reaction should they encounter the proposed facility, including the cage associated and the support vessel and/or harvest vessel or associated noise (e.g., vessel engine or barge generator), when moving through the area. A behavioral reaction could range from the animal approaching and investigating the facility to avoidance and moving away from the area. A potential source of disturbance from the proposed aquaculture facility would be vessel engine and barge generator noise. ESA-listed fish and sea turtles may also be attracted to aquaculture facilities as potential sources of food, shelter, and/or rest. However, any stress and behavioral effects on ESA-listed fish and sea turtles from disturbance are expected to be insignificant. The facility is not in an area known to be a hot spot or high-use area for any important activities (e.g., feeding, reproducing) of the sea turtle or ESA-listed fish species. Also, because this is a pilot study with only one cage in the open ocean, the proposed project site is small (each potential site <8 square kilometers) and will in no way limit movement or ability of a species to avoid the area or navigate through the area. As a result, disturbance from human activities and equipment and vessel operation resulting from the proposed action is expected to have only insignificant effects on ESA-listed fish and sea turtles.

Entanglement/Entrapment

The cage, mooring lines, and bridle line from the proposed project may pose an entanglement and an entrapment risk to ESA listed fish and sea turtles. Entanglements occur when lines, netting, or other man-made materials become wrapped around the body (e.g., flipper, fin) of the

⁵ NMFS. Vessel Strike Avoidance Measures and Reporting for Mariners NOAA Fisheries Service, Southeast Region, February 2008. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, Saint Petersburg, Florida.
<https://www.fisheries.noaa.gov/southeast/consultations/regulations-policies-and-guidance>

⁶ Barnette, M. C. 2018. Threats and Effects Analysis for Protected Resources on Vessel Traffic Associated with Dock and Marina Construction. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Saint Petersburg, Florida.

animal. Entrapment can occur when an animal becomes restrained or stuck in man-made structure and cannot escape. However, we believe the effects to sea turtles or ESA listed fish from entanglement will be discountable because of how the cage will be constructed and deployed. The risk of sea turtles and ESA listed fish being entangled or entrapped is greatly reduced by using rigid cage materials and by keeping all lines taut. The cage and moorings for the proposed project are constructed with rigid and durable materials, and the mooring lines will be constructed of steel chain and thick rope that will be maintained under tension by the ocean currents during most times of operation. For example, the lines would likely remain taut even as the currents shift because of the weight of the chain and rope creating a negative buoyancy on the facility anchorage lines. The cage, even in storm conditions, will be at least several meters from the sea floor, allowing safe passage under the cage. Additionally, the bridle line that connects from the swivel to the cage will be encased in a rigid pipe. The limited number of vertical mooring lines (3) and the duration of cage deployment (less than 18 months) will also reduce the risk of potential entanglement. Because of the proposed project operations and duration, we expect that the effects of possible entanglement to be discountable.

Water quality

Sea turtles and ESA-listed fish species may be affected by water quality/habitat degradation if it leads to reduced habitat quality. However, we believe any potential water quality effects on ESA-listed fish and sea turtles from the proposed action will be insignificant. Effluent from the proposed action can adversely affect water quality, sea floor sediment composition, and benthic fauna through the additions of uneaten feed, ammonia excretions, and fish feces from the increased fish biomass. The release of nutrients, reductions of dissolved oxygen, and the accumulation of sediments under certain aquaculture operations lead to eutrophication and degradation of benthic communities. The EPA evaluated the proposed action's potential impacts to water quality and impacts of organic enrichment to the seafloor and benthic communities. The EPA also considered the potential water quality impacts from chemical spills, drugs, cleaning, and solid wastes. The discharge of wastewater from the proposed project are expected to have a minor impact on water quality due to factors concerning the low fish biomass produced; the relatively small amounts of pollutants discharged; depth of the sea floor; and current velocities at the proposed action area. The EPA anticipates that the proposed activity would add relatively small amounts of nutrient wastes (nitrogen, phosphorus, particulate organic carbon, and solids) to the ocean in the immediate vicinity of the proposed action area. The facility's effluent is expected to undergo rapid dilution from the prevailing current; constituents will be difficult to detect within short distances from the cage. Per EPA's analysis, (1) water quality effects are not expected to occur more than 30 m (0.02 mi) away from the cage site due to the small size of the facility, and (2) sedimentation from the Vellella Epsilon facility is not expected to go more than 1,000 m (0.62 mi) from the cage, and impacts resulting from the proposed facility are likely limited to within 300 to 500 m (0.12 to 0.31 mi) from the cage. The discharges authorized by the proposed NPDES permit represent a small incremental contribution of pollutants and will have an insignificant affect any on the ESA-listed fish or sea turtles in the action area.

Conclusion

Because all potential project effects to listed species were found to be discountable, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species under NMFS's purview. This concludes your consultation responsibilities under the ESA for species under NMFS's purview. Consultation must be reinitiated if a take occurs or new

information reveals effects of the action not previously considered, or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. NMFS's findings on the project's potential effects are based on the project description in this response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

In your letter to us, you also initiated consultation pursuant to the Fish and Wildlife Coordination Act (FWCA). NMFS's Southeast Regional Office, Habitat Conservation Division reviewed the information in the Draft Biological Evaluation pursuant to the FWCA, and based on that review, we anticipate any adverse effects that might occur on marine and anadromous fishery resources would be minimal. Therefore, we do not object to issuance of the permit per the FWCA.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Jennifer Lee, Fishery Biologist, at (727) 551-5778 or by email at Jennifer.lee@noaa.gov.

Sincerely,

David Bernhart
Assistant Regional Administrator
for Protected Resources

cc: F/SER – J. Beck
F/SER31 – J. Lee

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