UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
National Centers for Coastal Ocean Science
Silver Spring, Maryland 20910

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MEMORANDUM FOR: The Record

FROM: Steven Thur, Ph.D.
Acting Director, National Centers for Coastal Ocean Science

SUBJECT: Categorical Exclusion for RESTORE Act Science Program Project #2624081, "Effects of Nitrogen Sources and Plankton Food-Web Dynamics on Habitat Quality for the Larvae of Atlantic Bluefin Tuna in the Gulf of Mexico"

NOAA Administrative Order (NAO) 216-6A, Environmental Review Procedures, requires all proposed projects be reviewed with respect to environmental consequences on the human environment. This memorandum addresses the determination that the activities described below for Project #2624081, "Effects of Nitrogen Sources and Plankton Food-Web Dynamics on Habitat Quality for the Larvae of Atlantic Bluefin Tuna in the Gulf of Mexico", qualifies to be categorically excluded from further National Environmental Policy Act review

Purpose and need

The RESTORE Act Science program is funding a three-year project to National Marine Fisheries Service (NMFS) researchers and sub-awardees to improve western Atlantic bluefin tuna (ABT) stock assessments by elucidating the mechanisms that link variability in nitrogen sources and food-web dynamics in the Gulf of Mexico (GoM) to habitat quality, feeding, growth and survival for ABT larvae.

Effective management of western Atlantic bluefin tuna (ABT) depends on understanding larval survival rates and the stock-recruitment relationship (SRR) in their spawning grounds in the (GoM). In the most recent assessment, however, uncertainties in environmental constraints on the SRR for ABT have led to differing "low" and "high" recruitment scenarios, with highly divergent implications for setting goals in fishing pressure and stock recovery potential. The question of ABT recruitment variability in the GoM is complicated by the complex circulation and mesoscale activity driven by the Loop Current (LC). The northern extension of the LC can separate, forming large anticyclonic rings that propagate westward at around 4 km/day with lifetimes of a year or more. Upwelling associated with these mesoscale features can increase both primary and secondary productivity, and/or concentrate prey in areas of convergent flow. The objective of this proposed project is to improve western ABT stock assessment by elucidating the mechanisms that link variability in nitrogen sources and food-web dynamics in the GoM to habitat quality, feeding, growth and survival for ABT larvae. Specific hypotheses will be evaluated to test the boundaries of anticyclonic (retentive) eddies as a mesoscale habitat that enhances growth and survival of ABT larvae and to assess relationships to new production nitrogen sources, food-web interactions that lead to preferred ABT prey, and variability of larval trophic position.

To meet project objectives, field sampling is proposed for two, 25 day cruises aboard the NOAA ship Nancy Foster during the peak spawning season in May 2017 and 2018. The sampling plan will use an ecosystem nitrogen focus to link biogeochemistry (δ15N of nitrate and exported material; nutrient uptake rates), phytoplankton (biomass, composition, taxon-specific growth and grazing rates), zooplankton (biomass, composition and grazing rates; trophic position by Compound-Specific Isotopic Analysis of Amino Acids, CSIA-AA), and larval tuna (abundance, size, growth rate, gut contents, and trophic position by CSIA-AA).

The following activities are proposed to meet project objectives

- Transect surveys
- Lagrangian experiments
    - Sediment trap arrays at three depths
    - Coordinated suite of sampling and process studies –
        - includes deployment of CTD rosette for nutrients, NO3- δ 15N, particulate C and N, δ15N of size-fractionated POM, microbial plankton community assessments by flow cytometry, microscopy and pigments, and to collect water for incubation experiments
        - Measurements of primary production (14C), N assimilation, and dilution estimates of phytoplankton growth and microzooplankton grazing rates will occur at 6-8 depths in the euphotic zone
- Daily mid-day and midnight net tow collections of larval ABT and prey
- Laboratory studies – (more detail below)

Shipboard experimental process studies will explore mesoscale features as areas that may have higher concentrations of bluefin tuna larvae. The studies will take place on 2 cruises (one in May 2017 and another expected for May 2018) and will be organized around water parcels/larvae patches marked by drogued, satellite-tracked drift arrays, which serve as moving frames-of-references for repeat sampling and platforms for *in situ* incubations to measure primary production, nitrogen uptake, and phytoplankton growth and grazing rates.

Action Area:
The cruise platform will be the NOAA ship Nancy Foster which is homeported at the Charleston Marine Support Facility, Charleston, South Carolina. The first cruise in May 2017 is expected to originate at key West, Florida and terminate at Miami, FL. The port locations for the 2018 cruise will be identical. Sampling areas in the GoM will be selected based upon locations of anticyclonic rings and other mesoscale features using methods described in Domingues et al. (2016), sea surface height derived from satellite altimetry and surface geostrophic velocity magnitude calculated from the geostrophic balance of pressure gradient and Coriolis. Most likely areas are shown in Figure 1.

An expected cruise itinerary for May 2017 is in Table 1. The itinerary for 2018 is likely to be similar in details as well as time of year.

Table 1. Expected cruise itinerary for May 2017 cruise (03 May 2017 - 04 June 2017 (NF-17-03/04)).

Date	**Itinerary**
03 May 2017	NOAA Ship Nancy Foster arrives Key West, Florida. Scientific personnel board.

07 May 2017	Depart from Key West, Florida (Leg 1 begins)
19 May 2017	Arrive at Progreso, Mexico (pending clearance)
23 May 2017	Depart from Progreso, Mexico (pending clearance). Leg 2 begins
03 June 2017	Arrive at Miami, Florida
04 June 2017	Depart from Miami, Florida

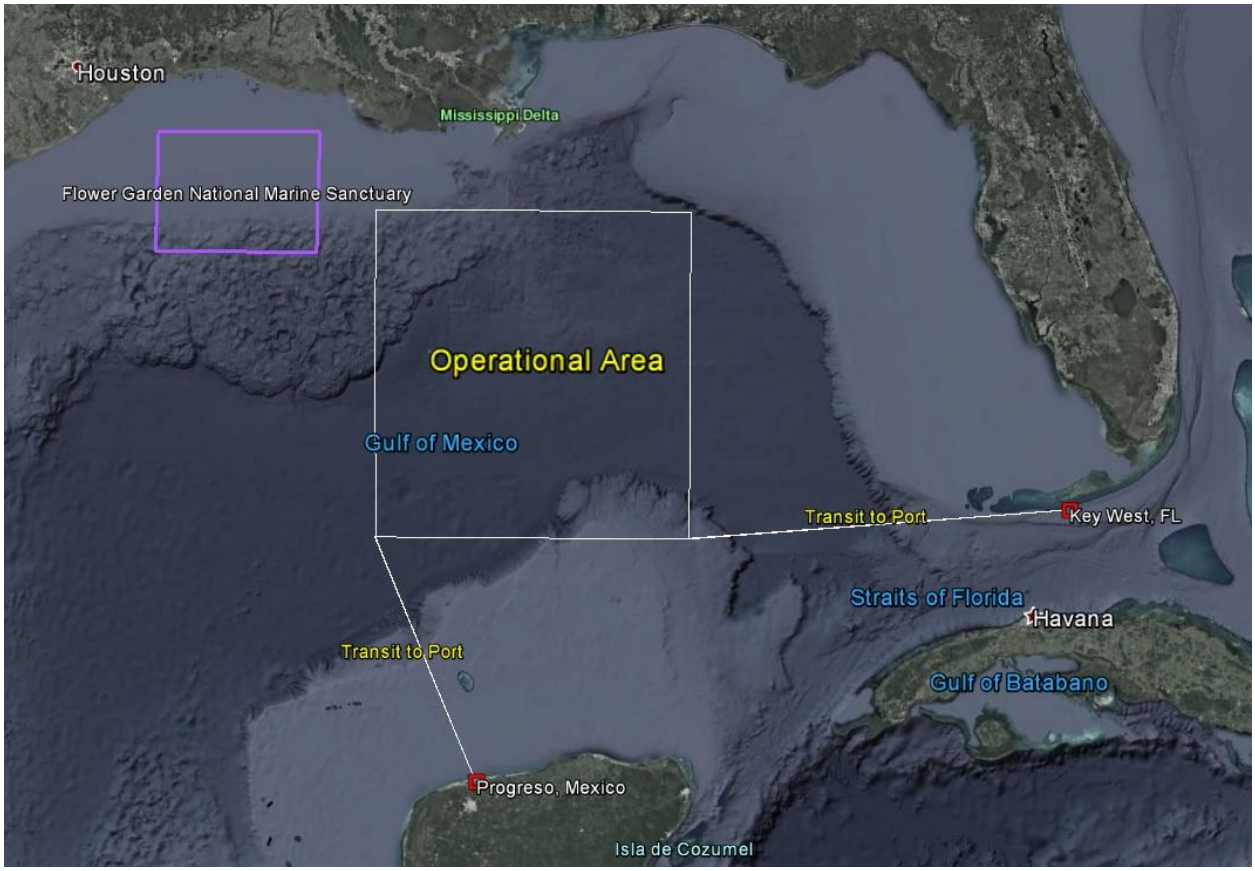

Figure 1. Map depicting expected transit path and operational area for the FY 2017 and 2018 research cruises from Key West, through Progreso Mexico, and return to Miami.

Project Activities:

1. Transect surveys. Transect surveys will be conducted across mesoscale features and adjacent waters, combined with Lagrangian-based experimental studies. Surveys will focus on environmental conditions and larval fish in near-surface waters (0-20 m) where ABT larvae reside, using onboard identification to locate larvae patches. To do this, plankton samples from net tows (see below) from 0-20 m depth will be examined by trained taxonomists using a stereomicroscope in the wet lab immediately after being collected. Larval ABT will be identified and counted. Typically > 10 indicates a patch and additional samples will be taken in the area to confirm. This will identify a positive (or negative) bluefin tuna station. The length of each "transect" is not defined as it will depend on the vertical structure of the water. Typically these transects are 20-30 nm in length with plankton and CTD stations spaced along the way. The object is to use the physical data to define the edge of the feature and to sample on both sides. For instance, a transect through an eddy would sample outside, the edge, and the interior of the eddy.

2. Lagrangian experiments. The PIs expect to initiate 4-5 quasi-Lagrangian experiments per cruise, each of 3-day duration with 4 daily sampling points. They will conduct the Lagrangian experiments where they find patches of fish larvae (not simply where they have identified an eddy). Each Lagrangian experiment will include a number of subcomponents:

    a. A separate, satellite-tracked sediment trap array (Figure 2) will be deployed for 3 days with traps attached at 3 depths (the lower euphotic zone (beginning at ~1-2% surface irradiance), below the euphotic zone (< 0.1% surface irradiance) and ~50 m below the euphotic zone base) measuring the quantity and composition of settling material. The array is a 75 lb weight at the bottom (approx. 200 m depth), a 3-m x 1-m holey-sock drogue centered at 15-m depth, a connected line of 8-10" surface floats for buoyancy, and a small (~8") tethered surface float for satellite telemetry. The surface lines are ~ 20 m length and made of polypropylene (float). The subsurface line below the drogue is ~3/8" VLS polyester rope. Crosses fabricated from gray PVC attach to the line at 3 depths. Each cross structure holds up to 12 replicate (VERTEX-style) sediment trap tubes.

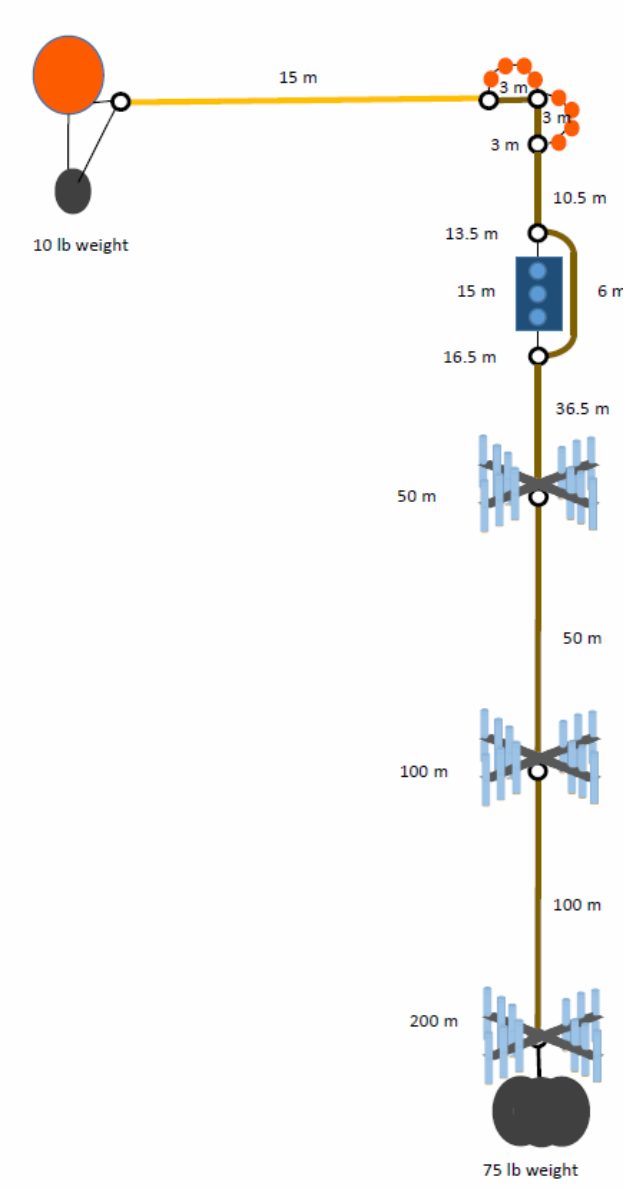

Figure 2. Diagrammatic representation of a sediment trap array.

b. At the main experimental array (also satellite-tracked and drogued identically to the sediment array above so they follow similar paths), a coordinated suite of sampling and process studies will be conducted with daily deployments throughout the course of the experiment. Pre-sunrise samples will be taken with a CTD rosette system for nutrients, NO3- δ 15N, particulate C and N, δ15N of size-fractionated POM, microbial plankton community assessments by flow cytometry, microscopy and pigments, and to collect water for incubation experiments. Measurements of primary production (14C), N assimilation, and dilution estimates of phytoplankton growth and microzooplankton grazing rates will occur at 6-8 depths (spanning the euphotic zone from ~2m to the depth of light penetration of 1% or 0.1% of surface irradiance, determined with a PAR sensor on the CTD rosette) in the euphotic zone. The experimental arrays have a surface float, a tethered float for satellite telemetry, the same 3-m x 1-m holey-sock drogue centered at 15-m depth as the sediment array so they travel a similar trajectory, and a small weight (~5-10 lbs) attached to the bottom (~100 m). The line that connects the pieces is coated ¼" wire with small built-in stainless steel attachment loops at various depths. Net bags containing experimental bottles are attached to the loops by long-line clips at the top of the bag and carabiners at the bottom of the bag. Water that is collected from the CTD at a given depth is incubated at the same depth on the array line (therefore same ambient temperature and light level). Samples are incubated for 24-h and then the in experimental array is recovered by hand, the mesh bags with samples are removed, replaced with a new set of incubations and redeployed. In this way, we conduct new in situ experiments at 6-8 depths during each day of the Lagrangian cycles.

c. Daily mid-day and midnight net collections (oblique hauls through the euphotic zone with a 1-m ring net (200-µm mesh, with depth recorder and flow meter)), integrated over the euphotic zone, to estimate size-fractioned biomass and grazing impact (gut fluorescence) of mesozooplankton. Net tows will be short (~10 min) and the collected animals immediately narcotized with carbonated water;

d. Daily or more frequent daytime net collections of ABT larvae and their prey in the upper 20 m using oscillating 5-10min tows of a 20cm mini bongo net;

e. 1x2 m net (500µm mesh) tow to collect ABT larvae from the surface to 20-m depth in an oscillating manner for ~ 10min to collect abundance, diet, CSIA-AA, age and growth analysis. This will usually be the first gear deployed at each and every station location to determine a positive or negative bluefin station. As such, they estimate 4-6 tows during daylight and 4-6 at night.

f. CTD sampling profiles, as needed, for ^{238}U:^{234}Th disequilibrium measurements of export and remineralization, NO3- δ 15N water column profiles, and ancillary studies.

3. Vessel Transit Operations. For both cruises the exact transit path is unknown and depends on the origin and destination ports of the vessel to be used. An example depiction of a potential vessel transit path for the FY 2016 Hypoxia Monitoring Cruise is shown in Figure 1. The exact path is unknown, and will be subject to prevailing wind, currents and sea conditions and is at the discretion of the ship's crew.

4. Anchoring. While no anchoring is anticipated for this cruise as a result of science activities, anchoring may be required for other reasons, such as avoidance of adverse weather conditions or in the unlikely event of an engine malfunction. While the choice of anchoring location is at the

discretion of the ship's crew, if anchoring were necessary, vessel operators would select the anchor location based on depth, protection from seas and wind, and bottom type. Preferred bottom types include sticky mud or sand; they would not anchor on rocky or coral reefs. When working in a previously unsurveyed area or an area that has not been surveyed in many years, the vessel may collect hydrographic data to provide information on where to drop the anchor (i.e., to avoid coral reefs and rocky seabed areas).

Lab analyses.

a. Shipboard. Ancillary experiments that focus particularly on the mixed-layer tuna larvae habitat and require more elaborate set up (e.g., full dilution series experiments or N cycling studies involving many bottles) will be done in shipboard incubators cooled by surface seawater and shaded to mean mixed-layer light. The full dilution experiments are standard, multi-treatment experiments used to test the linearity assumptions of the dilution method. Some nitrogen uptake experiments that will take place on board ship for measurements that either require too much water to be practical on the in situ array (N2 fixation) or samples that (due to rapid turnover of substrates) require that <24-hour incubations be conducted (NH4 uptake). Samples for these experiments will be collected from the CTD and spiked with either $^{15}N_2$, $^{15}NO_3$, or $^{15}NH_4$. They will be incubated for 4- or 24-hours in the deckboard incubators. After incubation, samples will be filtered, frozen and taken back to FSU for analysis or shipped to the UC Davis Analytical Lab.

b. The following analyses will take place in laboratories on land. Nutrient analyses will occur at FSU.

c. Samples (1 ml) for lab-based flow cytometry will be flash frozen on shipboard, and later at UH stained with Hoescht 33342 and analyzed with a Beckman-Coulter Altra flow cytometer equipped with a syringe pump for volume control, and dual argon lasers tuned to UV (225 mW) and 488 nm (1 W) excitation. Cells <10 μm will be analyzed (EPI at 630X) on slides prepared with paraformaldehyde-preserved samples (50 ml) on 0.8-μm filters (Brown et al. 2003). Cells >10 μm will be analyzed by EPI (200X) on 300-ml samples preserved on 8-um filters. Both preparations are stained with proflavin (0.33%) and DAPI (50 mg ml-1) and imaged/digitized with an automated Zeiss Axiovert 200 microscope.

d. Analyses of abundance, stomach contents, feeding selectivity, age and growth rates of tuna larvae will be done at the Early Life History laboratory at the NMFS SEFSC.

e. CSIA-AA analyses of variability in N sources and trophic positions of ABT larvae and preferred prey will be done at Scripps.

f. Phytoplankton production and nitrogen uptake water samples will be filtered and frozen for mass spectrometric analysis at the University of California-Davis analytical facility.

5. Office activities. Office activities will consist of inverse modeling to provide a framework for testing hypotheses regarding system linkages and functions as well as other data analyses, writing, outreach and publication.

Effects of the Project, Environmental Statutes & NCCOS Determination of Effects:

Species of Concern: Atlantic Bluefin tuna from the Western Atlantic are NMFS Species of Concern. Species of Concern are those species about which NMFS has some concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act. NMFS wishes to draw proactive attention and conservation action to these species. "Species of concern" status does not carry any procedural or substantive protections under the ESA so no consultations are required. This project is solely focused on larval ABT and is likely to capture only a negligible fraction of the population and thus have no impact on the species.

Endangered Species Act (ESA) Section 7 (a)(2) requires that each Federal agency, in consultation with NMFS and/or the U.S. Fish and Wildlife Service (USFWS), ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. No cruise activities would be impacting resources under the authority of USFWS, so no consultations with USFWS will be sought.

There are a total of seven (7) species of corals, seven (7) marine mammal species (details under MMPA section below), five (5) turtle species and five (5) fish species listed (or proposed) under ESA within the Gulf of Mexico (GOM) (Table 2) and South Atlantic (transit area) region (SA) from Miami, FL to approximately Key West, FL (Table 3). These species are listed as either endangered, threatened, candidate, or proposed. The distribution of corals is not expected to overlap with the research action area and vessel transit will have no adverse impacts on these species. Therefore, corals will not be analyzed further in this memorandum. The cruise research activities and vessel transit are not expected to have adverse impacts on the listed fish species. The primary concern is effects from the net tows. The nets are small, and the tows are short in duration and at low speeds in pelagic habitats away from the normal habitat of the listed fishes.

The northern and eastern section of the research operational area (Figure 1) may overlap slightly with loggerhead sea turtle critical habitat (LOGG-S-01), cruise research activities are not expected to have adverse impacts on any essential features of this critical habitat. The primary concerns to sea turtles are capture in tow nets or a vessel strike during ship transit between stations and to various ports. The nets are small, and the tows are short in duration and at low speeds in pelagic habitats, and the SEFSC has never caught a turtle in a plankton net. Thus, NCCOS determines that the capture of turtles is highly unlikely. Another risk for turtles is a vessel strike during transit. While unlikely, the risk a vessel strike would be further minimized through the employment of the best management practices (pg. 13), including maintenance of minimum approach distances.

Marine Mammal Protection Act (MMPA) - All marine mammals are protected under the MMPA. Sections 101 (a)(5)(A) and (D) allow the incidental take of marine mammals only under special circumstances, where “take is defined as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” (16 U.S.C. §1361-1421h). Harassment includes any annoyance which has the potential to injure a marine mammal or stock (Level A) or disrupt its behavioral patterns (Level B). Similar to the risk of vessel strike for turtles, cruise research activities are not expected to have adverse impacts on any marine mammal species. The primary concern is for a vessel strike during ship transit between stations or to and from the various ports.

There are seven (7) total species of threatened and endangered marine mammals whose potential ranges overlap with the action area of the operational research activities (Table 2) and/or vessel transit cruise (Table 3). These include, Humpback Whale *(Megaptera novaeangliae*- SA*)*, Blue Whale *(Balaenoptera*

musculus- SA*)*, Fin Whale (*Balaenoptera physalus*- GOM, SA), Sei Whale (*Balaenoptera borealis*- GOM,SA), Sperm Whale (*Physeter microcephalus*- GOM, SA), North Atlantic Right Whale (*Eubalaena glacialis*- SA), and Bryde's Whale (*Balaenoptera edenii*- GOM, *Proposed to be listed as endangered by December 2017*).

The risk of a vessel strike during transit operations is a direct threat to marine mammals, therefore NCCOS would employ, specific best management practices to minimize the risk during vessel transit operations (pg. 12). During transits, the ship may travel at higher speeds than 10 knots, but marine mammal observers are required. Marine mammal observers would alert the captain when whale species are observed in the ship's path, and would slow to a safe speed of 10 knots, remaining at least 500 yards away from any observed whales. Propeller noise during transit operations may have an indirect adverse effect on marine mammals and employing BMPs in their presence would minimize effects (pg 13). Therefore NCCOS determines that effects to marine mammals during vessel transit would be insignificant.

Table 2. Gulf of Mexico's Threatened and Endangered Species (Florida Bay to Texas border, includes Flower Gardens Banks) (http://sero.nmfs.noaa.gov/protected_resources/section_7/threatened_endangered/Documents/gulf_of_mexico.pdf). Updated 3/29/2017 from colette.cairns@noaa.gov.

Status	Species Name	Critical Habitat (in Gulf of Mexico)
Corals		
T	Elkhorn Coral (*Acropora palmata*)[1]	None in GOM
T	Staghorn Coral (*Acropora cervicornis*)	None in GOM
T	Lobed Star Coral *(Orbicella annularis*)	N/A
T	Boulder Star Coral (*Orbicella franksi*)	N/A
T	Rough Cactus Coral (*Mycetophyllia ferox*)	N/A
T	Pillar Coral (*Dendrogyra cylindrus*)	N/A
T	*Mountainous Star Coral* (*Orbicella faveolata*)	N/A
Mammals		
E	Fin Whale (*Balaenoptera physalus*)	N/A
E	Sei Whale (*Balaenoptera borealis*)	N/A
E	Sperm Whale (*Physeter macrocephalus*)	N/A
PE	Bryde's Whale (*Balaenoptera edenii*)	N/A
Sea Turtles		
T[2]	Green Turtle (*Chelonia mydas*)	N/A
E	Hawksbill Turtle (*Eretmochelys imbricata*)	N/A

E	Kemp's Ridley Turtle (*Lepidochelys kempii*)	N/A
E	Leatherback Sea Turtle (*Dermochelys coriacea*)	N/A
E, T*	Loggerhead Sea Turtle (*Caretta caretta*)	Yes linked here 38 designated marine areas in the southeast (includes South Atlantic & GOM)
Fishes		
T	Gulf Sturgeon (*Acipenser oxyrhynchus desotoi)*	Yes, linked here
E	smalltooth sawfish (*Pristis pectinata*)	Yes, linked here
PT	Giant Manta (*Manta birostris*)	N/A
C	Dwarf Seahorse (*Hippocampus zosterae*)	N/A
PT	Oceanic Whitetip Shark (*Carcharinus longimanus*)	N/A

E = Endangered, T = Threatened, C = Candidate, PE = proposed Endangered, PT = proposed Threatened.

*Some populations are considered threatened and others are considered endangered

Table 3. South Atlantic's Threatened and Endangered marine mammal and turtle species (North Carolina to Key West Florida), some of these overlap very slightly, with the return transit to Miami.

Status	**Species Name**	**Critical Habitat (in South Atlantic)**
Mammals		
E	Humpback Whale *(Megaptera novaeangliae)* baleen	N/A
E	Blue Whale (*Balaenoptera musculus*) baleen	N/A
E	Fin Whale (*Balaenoptera physalus*) baleen	N/A
E	Sei Whale (*Balaenoptera borealis*) baleen	N/A
E	Sperm Whale (*Physeter macrocephalus*) (toothed)	N/A
E	North Atlantic right whale (*Eubalaena glacialis*)	Yes in the southeast (winter calving grounds) and northeast (summer feeding and nursery grounds)
Sea Turtles		
E, T*	Green Turtle (*Chelonia mydas*)	N/A
E	Hawksbill Turtle (*Eretmochelys imbricata*)	N/A
E	Kemp's Ridley Turtle (*Lepidochelys kempii*)	N/A
E	Leatherback Sea Turtle (*Dermochelys coriacea*)	N/A
E, T*	Loggerhead Sea Turtle (*Caretta caretta*)	Yes linked here 38 designated marine areas in the southeast (includes GOM)

Magnuson-Stevens Fishery Conservation and Management Act (see this) requires that Federal agencies consult with NMFS on actions that "may adversely affect" Essential Fish Habitat (EFH) (16 U.S.C. §1855(b)(2)).

NCCOS examined two sources from the NOAA Office of Habitat Conservation (OHC) to conduct this analysis of potential impacts to EFH. NCCOS consulted the NOAA OHC, EFH mapper and the 2015 Final Essential Fish Habitat 5-Year Review for Atlantic Highly Migratory Species. Both sources indicated the following species groups or taxa potentially have EFH designated within the action area of transit (includes from Miami to Key West also) and/or the research operational area (Figure 1) as follows:

Species or Taxa within the operational area and transit

1. Albacore Tuna
2. Bigeye Tuna
3. Bluefin Tuna
4. Big eye Tuna
5. Bluefin Tuna
6. Skipjack Tuna
7. Yellowfin Tuna
8. Swordfish
9. Blue Marlin
10. Longbill Spearfish
11. Roundscale Spearfish
12. Sailfish
13. White Marlin
14. Bigeye Thresher
15. Bignose Shark
16. Common Thresher Shark
17. Longfin Mako
18. Oceanic Whitetip
19. Silky Shark
20. Tiger Shark
21. Whale Shark

Species Taxa in area of transit only

22. Atlantic Sharpnose shark
23. Bull Shark
24. Longfin Mako Shark
25. Bull Shark
26. Caribbean Reef Shark
27. Dusky Shark
28. Greater Hammerhead
29. Lemon Shark
30. Night Shark
31. Nurse Shark
32. Sandbar Shark
33. Scalloped Hammerhead Shark

Based on cruise activities and the potential EFH that could be encountered, NCCOS determines that no adverse effects to EFH, either direct or indirect, would occur within the proposed research action or transit area for the Lagrangian drift experiments or the various net tows as these instruments would not come into contact with the seafloor and would not reduce the quantity or quality of essential fish habitat. NCCOS would use BMPs (last section) when or if anchoring is needed, to avoid impacting EFH.

In addition, there are nineteen (19) Habitat Areas of Particular Concern (HAPC) within the GOM (see EFH mapper) and only the HAPC for Bluefin Tuna overlaps with the research operational area (Figure 1) or vessel transit activities. In addition, no EFH areas closed to fishing overlap with vessel transit or the research operational area. Based on this analysis, NCCOS determines that no adverse impacts are likely from the research, vessel transit or potential anchoring activities on this cruise.

National Marine Sanctuaries Act (NMSA) - Section 304(d) of the National Marine Sanctuaries Act requires the "action agency" to consult with the Office of National Marine Sanctuaries if the action is "likely to destroy, cause the loss of, or injure a sanctuary resource" (16 U.S.C. §1431 et seq.). At the start of the cruise the vessel will be at Key West in the Florida Keys National Marine Sanctuary and will then transit through the Sanctuary on the way to the research area. However, no operational activities will be conducted within the National Marine Sanctuary and no permit is required to use the port or transit the area; therefore, we will not be requesting a letter of concurrence pursuant to this Act.

National Historic Preservation Act (NHPA) - Section 106 requires Federal agencies to take into account the effects of their actions on historic resources (16 U.S.C. §470 et seq.). After review of the cultural resources data layer available from the National Park Service at the following website, NCCOS found no known Historic resources that are within the action area of cruise research activities. Further, no adverse impacts to cultural resources are expected as a result of either vessel transit or research activities, thus NCCOS will not be requesting a Section 106 consultation. However, according to NOAA nautical charts (#11006, 1113A, 411) there are known shipwrecks within the operational research area and transit, which given the depth would not be affected by research activities and within the area of transit would be avoided as hazards to navigation as appropriate.

Determination Summary and Extraordinary Circumstances

Project activities described above would be temporally (less than 4 weeks) and spatially small in scale (small footprint of lagrangian experiments, and nets with short tow times). No permits are required for this sampling. Sampling protocols are routine and have occurred hundreds of times in the past. It is not likely that any listed species would be collected because of the habitat being sampled and the small size and slow tow speeds used, and if so, they would be returned to the water as soon as it as practicable and NMFS OPR would be immediately notified. These activities are not the subject of controversy based on potential environmental consequences and do not establish a precedent or decision in principle about future proposals. There are no uncertain environmental impacts or unknown risks as project activities are routine and non-intrusive there will be no impact on geographically or ecologically critical areas, (sanctuaries, wetlands, watersheds), National Historic Sites, and no adverse impacts to marine mammals, essential fish habitat (marsh, wetlands, seagrasses, corals, etc.) or threatened and endangered species or their critical habitat. In addition activities do not include bird nesting areas, marine mammal nursery or feeding areas. The proposed project activity does not involve air, noise, or water quality impacts; and does not otherwise have a significant impact on the human environment. No adverse environmental impacts are anticipated from laboratory activities. Laboratory activities will follow all appropriate safety and disposal regulations. Waste chemicals from this project will be disposed of through a licensed hazardous waste Treatment, Storage, and Disposal (TSD) facility, transported by a licensed transportation contractor. The proposed project has no potential to generate, use, store, transport, or dispose of hazardous or toxic substances in a manner that may have a significant effect on

the environment. The proposed project does not have a disproportionately high and adverse effect on the health or the environment of minority or low-income communities, compared to the impacts on other communities (EO 12898). The project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or involve actions that may promote the introduction, growth, or expansion of the range of the species. The applicants have approval for all activities regarding vertebrate animals from their Institutional Animal Care and Use Committee(s) under the Animal Welfare Act and related policies and regulations. Thus, there is no potential to violate Federal, State, or local law or requirements imposed for protection of the environment. There are no highly controversial environmental effects. Thus, there are no extraordinary circumstances present that may require further analysis in an EA or EIS.

- Pursuant to Section §305(b) of the Magnuson-Stevens Fishery Consultation and Management Act (MSA;16 U.S.C. 1855(b)), NCCOS determines that project activities would not affect the quantity or quality of essential fish habitat (EFH). Therefore we are not seeking authorization under Section §305(b) of MSA for this action.

- Pursuant to Section 7 of the Endangered Species Act (ESA), NCCOS determines that project activities would not have adverse effects on any listed (threatened or endangered) species or designated critical habitat. Therefore, we are not seeking authorization under Section 7 of ESA for this action.

- Pursuant to Section 101(a)(5)(A) of the Marine Mammal Protection Act (MMPA). NCCOS does not expect that this project's activities would result in an unauthorized take of any marine mammals. Therefore we are not seeking authorization under Section 101(a)(5)(A) of the MMPA for this action.

- This project's activities will not result in any impact to National Historic Sites, thus we are not seeking authorization under Section 106 of the NHPA at this time.

Categorical Exclusion Determination

This project is covered by the Categorical Exclusion, E5 and is defined in NAO 216-6A Companion Manual as activities involving invasive techniques or methods that are conducted for scientific purposes, when such activities are conducted in accordance with all applicable provisions of the Endangered Species Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, and Magnuson-Stevens Fishery Conservation and Management Act. Such activities will be limited to impacting living resources on a small scale relative to the size of their populations, and limited to methodologies and locations to ensure that there are no long-term adverse ecosystem impacts, the proposed project falls within the scope of the E5 categorical exclusion. Cumulative effects are negligible. As such, project activities are categorically excluded from further NEPA review.

References

Domingues, R., et al. 2016. Variability of preferred environmental conditions for Atlantic bluefin tuna (*Thunnus thynnus*) larvae in the Gulf of Mexico during 1993–2011. Fisheries Oceanography, 25:320-336.

Protective Measures and Best Management Practices (BMPs) Incorporated into the Action

In the event of unauthorized incidental take, NCCOS would suspend all activities causing such take and immediately contact NMFS Office of Protected Resources (see contact below). NCCOS would request ESA Section 7 initiation in the event of unauthorized take, systematic noncompliance, unanticipated adverse effects, or modification of the action.

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BMPs are required to be incorporated within project instructions, cruise plans and NEPA documentation including financial assistance awards and environmental review memoranda. All applicable BMPs must be communicated to the principal investigators, boat operators and field staff, and as necessary between ship's crew (Commanding Officer/master or designee(s), as appropriate) and scientific party in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

1. Minimize vessel disturbance and ship strike potential
    a. Reduced speeds (<13 knots) when transiting through ranges of ESA-listed cetaceans (unless otherwise required, e.g., NOAA Sanctuaries)
    b. Reduced speeds (<13 knots) while transiting through designated critical habitat (unless slower speeds are required, e.g., < 10 knots in Right Whale critical habitat and management areas)
    c. Trained observers aboard all vessels; 100% observer coverage
    d. Species identification keys (for marine mammals, sea turtles,– as applicable) will be available on all vessels

2. Minimize noise
    a. Reduced speed (see above)
    b. Multibeam surveys using ≥ 50 kHz frequencies, lowest possible power and ping-rate
    c. Single beam surveys using ≥ 30 kHz frequencies, lowest possible power and ping-rate, and 12° beam angle.
    d. Reduce use of active acoustics as much as possible. Active acoustic sources should be used only when required for navigation or data collection and should be used at the lowest source level and highest frequency available that is suitable for the purpose.

3. Minimize vessel discharges (including aquatic nuisance species)
    a. Meet all EPA Vessel General Permits and Coast Guard requirements.
    b. Avoid discharge of ballast water in designated critical habitat.
    c. Use anti-fouling coatings.
    d. Clean hull regularly to remove aquatic nuisance species.
    e. Avoid cleaning of hull in critical habitat.
    f. Avoid cleaners with nonylphenols.
    g. Rinse anchor with high-powered hose after retrieval.

4. Minimize anchor impact to corals, seagrass or other EFH

a. Use designated anchorage area when available
b. Use mapping data to anchor in mud or sand, to avoid anchoring on corals
c. Avoid anchoring in seagrass critical habitat
d. Minimize anchor drag

5. Avoid collecting bottom samples in seagrass critical habitat
    a. There will be no bottom sample collections of any kind conducted during this cruise

6. Cetaceans
    a. Avoid approaching within 200 yards (182.9 m), 500 yards for Right Whales.
    b. Avoid critical habitat, when possible.

7. Sea Turtles and Manatees
    a. Avoid approaching within 50 yards.

8. Entanglement Protective Measures
    a. Use stiffer line materials for towing and keep taut during operations to reduce potential for entanglement
    b. Reduce knots in the line as much as possible
    c. Clearly mark lines in the event an animal does become entangled so that NMFS experts can identify the gear.

9. Habitat Protection
    a. Avoid contact of gear, towed or lowered, with the sensitive bottom habitat (e.g. submerged aquatic vegetation (SAV) and hard bottom)