
Finding of No Significant Impact (FONSI)
Authorization for
Fisheries and Ecosystem Research Conducted and Funded
by the
Southeast Fisheries Science Center
National Marine Fisheries Service
March 2020

Background

Proposed Action

The federal action analyzed in the Final Programmatic Environmental Assessment (FPEA) is the proposed continuation of SEFSC fisheries and ecosystem research activities. The purpose of SEFSC fisheries and ecosystem research is to produce scientific information necessary for the management and conservation of living marine resources in the Atlantic Ocean, Gulf of Mexico, and the Caribbean Sea around Puerto Rico and the U.S. Virgin Islands. SEFSC's research is needed to promote both the long-term sustainability of the resource and the recovery of certain species, while generating social and economic opportunities and benefits from their use.

Alternatives Evaluated in the Environmental Assessment

After screening potential alternatives against criteria to meet the purpose of the action, NMFS identified a No Action and three action alternatives for analysis:

- Alternative 1 - *The No-Action/Status Quo Alternative, Conduct Federal Fisheries and Ecosystem Research with Scope and Protocols Similar to Past Effort* includes fisheries and ecosystem research using the same protocols as were implemented in the recent past (considered to be from 2008 through 2014 for the purposes of this FPEA). These federal research activities are necessary to fulfill NMFS mission to provide science-based management, conservation, and protection of living marine resources in the areas covered by the SEFSC. Under Alternative 1, the SEFSC would use the same scope of research as in recent years and with current mitigation measures for protected species.
- Alternative 2 - *The Preferred Alternative, Conduct Federal Fisheries and Ecosystem Research (New Suite of Research) with Mitigation for MMPA and ESA Compliance* includes a combination of research activities continued from the past and additional, new research surveys and projects as described in Table 2.3-1. The Preferred Alternative includes a suite of mitigation measures to reduce the risk of adverse interactions with protected species.
- Alternative 3 – *Modified Research Alternative, Conduct Federal Fisheries and Ecosystem Research (New Suite of Research) with Additional Mitigation*. Under Alternative 3, the SEFSC would conduct and fund the same scope of fisheries and ecosystem research as described in the Preferred Alternative and would include all of the same mitigation measures considered under the Preferred Alternative, plus a number of additional mitigation measures derived from a variety of sources. The additional measures include changes to visual monitoring methods for protected species (e.g., dedicated Protected Species Observers and technological methods to improve detection under poor visibility conditions), operational restrictions on where and when research may be conducted, and adoption of alternative methodologies and equipment for sampling. One or more of the additional mitigation measures may be considered for implementation during the MMPA and ESA consultation processes

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- *Alternative 4 - No Research Alternative, No Fieldwork for Federal Fisheries and Ecosystem Research Conducted or Funded by SEFSC.* The SEFSC would no longer conduct or fund fieldwork for the marine fisheries and ecosystem research considered in the scope of this FPEA, but would not extend to research that is not in scope of this FPEA, such as directed research on marine mammals and ESA-listed species covered under separate research permits and NEPA documents. NMFS would need to rely on other data sources, such as fishery-dependent data (i.e., harvest data) and state or privately supported fishery-independent data collection surveys or programs to fulfill its responsibility to manage, conserve and protect living marine resources in the U.S.

Selected Alternative

Alternative 2 - Conduct Federal Fisheries and Ecosystem Research (New Suite of Research) with Mitigation for MMPA and ESA Compliance, has been selected as the Preferred Alternative.

Measures to Reduce Impacts

The Preferred Alternative includes a suite of mitigation measures to reduce the risk of adverse interactions with protected species (see Section 2.3.2). Scientific procedures and data reporting protocols have been specified in contracts with cooperating research partners and specific procedures to avoid or report interactions with protected species will be incorporated into contracts for future research. Below is a brief overview of key mitigation and monitoring measures included under the Preferred Alternative.

- SEFSC will implement the move-on rule upon observation of any marine mammal other than dolphins and porpoises attracted to the vessel. If one or more marine mammals (other than dolphins and porpoises) are observed near the sampling area and are considered at risk of interacting with the vessel or research gear, or appear to be approaching the vessel, SEFSC shall either remain onsite or move on to another sampling location. If remaining onsite, the set shall be delayed until the animal(s) depart or appear to no longer be at risk of interacting with the vessel or gear.
- During all trawl surveys, dedicated marine mammal observations will occur at least 15 minutes prior to gear deployment. SEFSC will conduct fishing operations as soon as possible or delay deployment of gear if there is risk of protected species interactions. Tows will be limited to 30 minutes (except for sea turtle research trawls).
- During seine and gillnet surveys, SEFSC will limit soak time to the shortest duration needed to conduct sampling. Marine mammal observation monitoring will occur at least 15 minutes prior to gear deployment and nets will be hand checked every 30 minutes if soak times are longer than 30 minutes or immediately if disturbance is observed.
- During hook and line surveys in waters greater than 200 m, SEFSC will initiate marine mammal monitoring at least 30 minutes prior to deploying gear. If longline operations have been delayed because of the presence of protected species, the vessel resumes longline operations only when these species have not been sighted within 15 minutes if in less than 200 m or 30 minutes if greater than 200 m of water, or otherwise determined to no longer be at risk.

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- A minimum of two members of the scientific party must receive formal training through NMFS Highly Migratory Species/Protected Species Safe Handling, Release, and Identification Workshop¹ or other similar workshops. This workshop is designed to teach protected species identification as well as proper techniques for safe handling and release of entangled or hooked protected species, such as sea turtles, marine mammals, and smalltooth sawfish.
 - The SEFSC will initiate a process for its FPCs, SWLs, scientists, and vessel captains and crew to communicate with each other about their experiences with protected species interactions during research work with the goal of improving decision-making regarding avoidance of adverse interactions.
 - For all SEFSC and partner research projects, mitigation measures are included in the written cruise instructions. In addition, informational placards and reporting procedures will be reviewed and updated as necessary for consistency and accuracy.
 - The SEFSC will incorporate specific language into its contracts that specifies training requirements, operating procedures, and reporting requirements for protected species that will be required for all surveys conducted by research partners, including those conducted on chartered vessels.

Public and Agency Comments Received on the DPEA

The DPEA was made available for comment on April 20, 2016 (81 Federal Register [FR] 23276). Only one substantive public comment letter was received during the review period. This letter from Humane Society of the United States (HSUS) commented almost exclusively on the impacts to bottlenose dolphins. The HSUS is concerned that the DPEA underestimates the impacts of the Preferred Alternative and that additional mitigation measures are insufficient to protect bottlenose dolphins. The final rule for the Taking and Importing Marine Mammals; Taking Marine Mammals Incidental to Southeast Fisheries Science Center Fisheries Research requires that the SEFSC Continue investigation on the effectiveness of modifying lazy lines to reduce bottlenose dolphin entanglement risk, and establish and convene the South Carolina Department of Natural Resources (SCDNR) Working Group to better understand bottlenose dolphin entanglement events and apply effective mitigation strategies.

NMFS requested comments from USFWS on the Notice of Availability of the 2016 DPEA. USFWS responded on May 18, 2016 with specific comments and recommended mitigation measures for netting activities in manatee habitat, and concerning compliance with the Migratory Bird Treaty Act (MBTA) which are reflected in the FPEA.

NMFS provided a copy of the 2016 DPEA to state fish and wildlife agencies in every state affected by the fisheries and ecosystem research activities examined in this FPEA. NMFS considered all comments from these agencies in preparation of the FPEA and will comply with the Fish and Wildlife Conservation Act (FWCA) as necessary.

¹ (<https://www.fisheries.noaa.gov/atlantic-highly-migratory-species/safe-handling-release-and-identification-workshops>)

Consultations

The SEFSC consulted with the NMFS Southeast Regional Office and U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA for species that are listed as threatened or endangered. These consultations resulted in the development of a NMFS Biological Opinion (BiOp) which was signed on May 9, 2016. Section 9.2 of the 2016 BiOp stated that the estimated take associated with proposed research described herein “is not likely to jeopardize the continued existence of green, hawksbill, Kemp’s ridley, leatherback, or loggerhead sea turtles, smalltooth sawfish, the Central and Southwest Atlantic DPS of scalloped hammerhead shark, shortnose sturgeon, or any DPS of Atlantic sturgeon.” Informal consultation with USFWS resulted in the development of mitigation and monitoring measures for Florida manatees to be implemented during SEFSC research that may occur in Florida manatee habitat. A series of letters dated May 17 and 22, 2017 confirmed the final mitigation and monitoring measures agreed upon between SEFSC and USFWS and concluded consultation with USFWS under Section 7 of the ESA.

On November 23, 2016, SEFSC initiated consultation with the twelve affected states’ and two territories’ Historic Preservation Offices (TX, LA, MS, AL, FL, GA, SC, NC, VA, DE, MD, NJ, USVI and PR) under Section 106 of the National Historic Preservation Act. SEFSC received five responses to its letters during a thirty-day review period. Three states (VA, SC, and FL) responded in concurrence. Two states (GA and NC) responded with no comments or historical places within the working area. The remainder of the Historic Preservation Offices that were contacted did not respond. All responses were received on or before December 29, 2016 and the consultation is considered complete.

Significance Review

The Council on Environmental Quality (CEQ) regulations state that the significance of an action should be analyzed both in terms of “context” and “intensity” and lists ten criteria for intensity. The Companion Manual for NOAA Administrative Order 216-6A requires consideration of CEQ’s context and intensity criteria (40 CFR 1508.27(a) and 40 CFR 1508.27(b)) along with six additional factors for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and is considered individually as well as in combination with the others.

1) Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

No. The analysis provided in Chapter 4 of the FPEA shows that the potential direct and indirect impacts on the physical and biological environments under the three research alternatives are similar and would have minor to moderate adverse effects. The three research alternatives would have minor to moderate beneficial effects on the social and economic environment of fishing communities by providing the scientific information needed for sustainable fisheries management and by providing funding, employment, and services. Specifically, the FPEA determined that Alternative 2, the Preferred Alternative, would have minor adverse effects on the physical environment, special resource areas, fish, birds, sea turtles and invertebrates, and minor to moderate adverse effects on marine mammals. The social and economic environment under the Preferred Alternative would experience minor to moderate beneficial effects.

The No Research Alternative, in contrast, would eliminate the direct adverse effects of the research alternatives on the marine environment but would have minor to moderate adverse, indirect effects on several biological resources due to increasing uncertainty in future resource management decisions caused by the loss of scientific information on the marine environment from the SEFSC. The No Research Alternative was also considered to have minor to moderate adverse effects on the social and economic environment of fishing communities by having relatively minor to moderate economic impacts on various communities as well as long-term and widespread adverse impacts on sustainable fisheries management.

2) Can the proposed action reasonably be expected to significantly affect public health or safety?

The proposed SEFSC research activities are not expected to impact public health or safety. Fisheries and ecosystem research programs, including the removal of small amounts of fish, would pose no threats to humans.

3) Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

The research programs occur at sea, so park lands, prime farmlands, wetlands and wild and scenic rivers do not apply. However, benthic habitats and EFH can be ecologically critical areas. Under the Preferred Alternative, direct impacts to benthic habitats would occur through the use of several bottom-contact fishing gears (primarily trawl gears). The FPEA analyzes the total footprint of

SEFSC-affiliated research on benthic habitat, including EFH; the effects are considered small in magnitude and localized in geographic scope, although impacts on sensitive benthic substrates, should they occur, may last several years. The overall impacts on benthic habitats and EFH would be considered minor adverse according to the impact criteria used in the analysis (Table 4.1-1).

Research does occur in Marine Protected Areas (MPAs)² and National Marine Sanctuaries. The MPAs in SEFSC research areas are shown in Figure 3.1-15. The FPEA analyzes the proportion of research sampling and biomass removals made within National Marine Sanctuaries in the Atlantic and Gulf of Mexico. The numbers of samples taken within Flower Garden Banks, Florida Keys, and Gray's Reef National Marine Sanctuaries and the removals of fish and invertebrates for scientific purposes are small and would have temporary and minor adverse effects on each Sanctuary. SEFSC survey activities within National Marine Sanctuaries may result in interactions with protected species, including marine mammals, sea turtles, and ESA-listed birds and fish species. Interactions with marine mammals may include disturbance from vessels, active acoustic equipment, and incidental take. However, SEFSC fisheries and ecosystem research survey activities have not resulted in any capture, serious injury, or mortality takes of protected species within NMS boundaries in the past five years.

4) Are the proposed action's effects on the quality of the human environment likely to be highly controversial?

The effects of this action are not considered to be highly controversial. The potential direct and indirect effects of fisheries and ecosystem research on biological resources would continue to occur but would be mostly minor adverse, with the exception of effects on marine mammals which could be moderately adverse. Effects would be small in magnitude and would be dispersed over a large geographical area.

Effects on the social and economic environment would be minor to moderately beneficial. The process of and need for conducting fisheries and ecosystem research to support and manage fisheries is generally viewed as a beneficial action that will contribute to improved fisheries management and opportunities for sustainable harvests of seafood products.

5) Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

The potential impacts associated with conducting SEFSC fisheries and ecosystem research activities are not unique or uncertain. Research techniques have been developed over many years, are well understood, and are similar to commercial fishing techniques employed to catch target species. Commercial fishing activities also impact non-target species through direct capture and through exposure to active acoustic systems that aid in navigation and finding fish species of interest. The impacts of these activities have been analyzed FPEA. SEFSC fisheries and ecosystem research activities are much smaller in scale than commercial fishing efforts, and potential effects associated with conducting the research are relatively certain and do not pose unique or unknown risks.

² Defined by Executive Order 13158 as "any area of the marine environment that has been reserved by federal, state, tribal, territorial, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein."

6) Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?

The SEFSC fisheries and ecosystem research program would not set a precedent for future actions with significant effects or represent a decision in principle about a future consideration. In the FPEA, SEFSC has conducted a thorough analysis of its fisheries and ecosystem research program, identified mitigation measures to reduce impacts, and has determined that the research activities will not result in a significant impact. As research needs and techniques change, NMFS will continue to evaluate any potential impacts to the physical, biological, and human environments. The finding that the SEFSC research program including the associated mitigation measures will not result in a significant impact will not set a precedent or prejudice the outcomes of future analyses of similar research programs.

7) Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?

The SEFSC fisheries and ecosystem research activities described in the FPEA are not expected to result in cumulatively significant adverse impacts when considered in relation to other separate actions with individually insignificant effects. In addition to SEFSC research efforts, there are many current and reasonably foreseeable activities that may contribute to cumulative impacts on the marine environment, including: conservation efforts, commercial shipping, commercial and recreational fisheries, oil and gas and alternative energy development, military activities, coastal development projects, marine research activities by other agencies and institutions, and other human activities that contribute to global climate change. These actions can produce both adverse and beneficial impacts that directly and indirectly affect ocean resources managed by NMFS and the social and economic environment of fishing communities that rely on them.

SEFSC research activities would have minor to moderate adverse effects on the various resource components of the physical and biological environments. Because SEFSC research activities involve a small number of vessels compared to other vessel traffic and collect relatively small amounts of biomass compared to commercial and recreational fisheries, the contribution of the Preferred Alternative to cumulative adverse effects on fish, marine mammal, and other species and resource areas would be small under normal conditions. The proposed SEFSC scientific research activities will also have beneficial contributions to the cumulative effects on both biological and socioeconomic resources. The research alternatives contribute substantially to the science that feeds into federal fishery management measures aimed at rebuilding and managing fish stocks in a sustainable manner. It also contributes to understanding the nature of changes in the marine environment and adjusting resource management plans accordingly, and it helps meet international treaty research obligations. The research activities under the three research alternatives help alleviate adverse cumulative impacts on the biological and socioeconomic environments, resulting in long-term beneficial contributions to cumulative effects.

8) Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

The research programs take place at sea and would have no direct effect on terrestrial cultural or historic resources. However, SEFSC research does occur in three National Marine Sanctuaries (Flower Garden Banks, Florida Keys, and Gray's Reef), which protect historical resources such as shipwrecks and other archeological objects. Bottom-contact gear can disturb historical resources. The exact locations of any known historical properties and archeological resources are not made public in order to minimize the risk of unauthorized salvage efforts. However, prior to using bottom contact gear, the SEFSC notifies the Office of National Marine Sanctuaries to compare planned sampling coordinates with their list of historical sites. If there is overlap, SEFSC chooses a new sampling site for that cruise. If potential archaeological sites are not identified, but the research gear incidentally brings aboard any artifacts, they must be photographed and Sanctuary staff immediately contacted for directions on the disposition of the artifact. Due to these established protocols, the SEFSC determined the proposed activity would have "No Adverse Effect" on submerged historic or archaeological properties.

9) Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat, as defined under the Endangered Species act of 1973?

SEFSC fisheries and ecosystem research activities are not likely to significantly impact threatened and endangered species listed under the ESA. ESA-listed marine mammal, fish, bird, turtle, and invertebrate species are found in areas of SEFSC research. The FPEA evaluates the affected environment and potential effects of SEFSC fisheries and ecosystem research that could result in injury and mortality to protected species incidental to research activities. Mitigation measures emphasized under the Preferred Alternative that should reduce incidental take of marine mammals and other protected species are described in Section 2.3.2 of the Final PEA. See Sections 4.3.3.1 (ESA-listed fish), 4.3.4 (ESA-listed marine mammals (subsections for ARA, GMRA, and CRA)), 4.3.5 (Birds), 4.3.6 (Sea turtles), and 4.3.7 (Invertebrates and Plants) in the Final PEA for the appropriate analyses. In addition, NMFS prepared a Section 7 consultation Biological Opinion (BiOp) for Fisheries Independent Monitoring (FIM) and a BiOp on the effects of survey and sampling activities conducted by Georgia Department of Natural Resources (GADNR) and funded by the USFWS in the waters off the coast of Georgia. The BiOps considered ESA-listed fish, marine mammals, sea turtles, an invertebrates and plants (corals and seagrass) managed by NMFS. The findings for each group are summarized below.

ESA-Listed Fish

Six fish species with multiple Distinct Population Segments (DPS) are listed as threatened or endangered under the ESA in the SEFSC research areas: Atlantic sturgeon, gulf sturgeon, largemouth sawfish, scalloped hammerhead shark, shortnose sturgeon, and smalltooth sawfish. For ESA-listed species, incidental capture of Atlantic sturgeon has occurred on a regular basis in bottom-trawl surveys, especially in nearshore surveys in shallower water, but all of these fish have been released

alive and in apparently good condition. Such incidental captures would likely continue to occur on a regular basis under the Preferred Alternative but the risk of mortality would be low due to short tow times in research protocols. Incidental capture of smalltooth sawfish has occurred and would likely continue to rarely occur and would have minimal effects on the population. Impacts on Atlantic sturgeon benthic habitat would be limited to temporary and localized increases in turbidity from research bottom-contact gear and accidental contamination, if it occurred, from fuel spills and other compounds from research vessels. Given the spill response equipment and emergency training required of all research vessels by Coast Guard regulations regarding safety and pollution prevention, and the experience of OMAO and charter captains and crew, the potential for accidental fuel spills or other contamination from research vessels is considered small and any incidents would likely be rare, small in magnitude, and quickly contained. The FPEA found that the overall effects of the SEFSC research on ESA-listed fish would be minor in magnitude, distributed over a wide geographic area, and temporary or short-term in duration and would therefore be considered minor adverse according to the criteria in the FPEA.

The FIM BiOp determined that Gulf sturgeon and Gulf sturgeon critical habitat would not be adversely affected. While smalltooth sawfish critical habitat would not be adversely affected by FIM projects, the species itself was determined likely to be adversely affected along with shortnose sturgeon, Atlantic sturgeon and scalloped hammerhead sharks of the Central and Southwest Atlantic Distinct Population Segments (DPS). Critical habitat for shortnose and Atlantic sturgeon and scalloped hammerhead sharks has not been designated in the Action Area for FIM research. The BiOp concluded that the action is not likely to jeopardize the continued existence of any ESA-listed species. The BiOp for GADNR projects assessed impacts to Atlantic and shortnose sturgeon are likely to be adversely affected but the proposed action is not likely to jeopardize the continued existence of these species.

Several SEFSC research activities involve directed research on ESA-listed fish species (e.g., Smalltooth Sawfish Abundance Survey) or sea turtles (e.g., In-Water Sea Turtle Research). These projects have operated under ESA section 10 research permits issued by NMFS OPR and SEFSC will continue to apply for section 10 permits in the future. The intentional effects of the research activities on listed species has been and will continue to be assessed within the section 10 permit process and are not covered under the FPEA. The indirect or unintentional effects of that research on other resources are analyzed in the FPEA.

ESA-Listed Marine Mammals

The threatened and endangered marine mammals that occur in the Atlantic Research Area (ARA) include North Atlantic right (NARW), humpback, fin, and sperm whales, and the Florida manatee. Manatees are under the jurisdiction of the USFWS, while the cetaceans are under the jurisdiction of NMFS. The threatened and endangered marine mammals that regularly occur in the Gulf of Mexico Research Area (GOMRA) include sperm whales and manatees and those in the Caribbean Research Area (CRA) are humpback whales, sperm whales, and West Indian manatees. The FPEA determined that the effects of the Preferred Alternative on all marine mammal species would be minor to moderate in magnitude, dispersed over a large geographic area, and non-mortality impacts would be

temporary or short-term in duration. Therefore, overall effects would be considered minor to moderate adverse.

The BiOps for FIM and GADNR research each determined that the proposed action is not likely to adversely affect the following listed species or critical habitat under the ESA: blue whale, sei whale, sperm whale, fin whale, NARW or NARW critical habitat.

ESA-Listed Birds

Four bird species in the SEFSC research areas are ESA-listed: roseate tern, piping plover, Bermuda petrel, and red knot. The FPEA found that the overall effects on seabirds from SEFSC research activities under the Preferred Alternative would likely be minor in magnitude, dispersed over a large geographic area, and temporary or short-term in duration. In summary, effects would be considered minor adverse.

ESA-Listed Sea Turtles

All of the sea turtles found in the area of the SEFSC research activities are listed as threatened or endangered under the ESA including green turtle, hawksbill turtle, Kemp's Ridley turtle, leatherback turtle, and loggerhead turtle. Behavioral disturbances of sea turtles from research vessels or fishing gear would be temporary in nature, lasting only a few minutes as the research vessel passes, and are therefore likely to have negligible effects on turtle foraging success or survival. The potential for research vessels to degrade turtle habitat through benthic disturbance or contamination from accidental spills and discharges would likely be minor in magnitude, infrequent or rare, and localized.

Four species of ESA-listed sea turtles have been incidentally captured or hooked in SEFSC-affiliated research gear in the past, including trawls, longline gear, gillnets, and trammel nets, and all of these have occurred in the GOMRA or ARA. These incidental takes have occurred on a regular basis but almost all of these turtles have been released alive in good to excellent condition. Only two sea turtles have been recorded to be mortalities since 1990, although there have been infrequent cases of serious injury. The incidental capture of sea turtles by researchers also provides an opportunity to collect information on the physiological health of sea turtle populations and to tag individual turtles fitted with PIT and flipper tags. The collection of this scientific information on sea turtles has a beneficial effect on turtle management and potentially indirect benefits to sea turtle species.

Future incidental captures of sea turtles in research gear types are certain but it is likely that most of these turtles will be released in good condition because of the short tow and set durations of most SEFSC research activities and the presence of trained turtle-handling personnel on research crews. There is a potential for serious injury and mortality of sea turtles in research gear, primarily in longline gear. The FPEA uses a number of assumptions to provide a precautionary estimate of future captures/hookings of sea turtles in SEFSC-affiliated research gear but future serious injuries and mortalities are expected to be rare (less than one per year). This level of mortality for these species, if it occurred, would be minor in magnitude relative to the overall size of these populations. The increase risk of capture of sea turtles in these areas under the Preferred Alternative would be very small relative to the overall numbers of sea turtles expected to be captured or hooked in SEFSC-affiliated research (about 133 turtles per year under the Status Quo, Table 4.2-26). Although this may introduce risk of captures and injuries or mortality in an area where no captures have occurred in the

past, the overall impact on sea turtles due to gear interactions would still be considered minor in magnitude under the Preferred Alternative.

The effects of the Preferred Alternative on sea turtles through disturbance, changes in prey availability, and contamination or degradation of habitat would be considered minor adverse. The Preferred Alternative includes several new training and communication programs intended to improve the effectiveness of the existing mitigation measures used to protect sea turtles and other protected species. It is not possible to quantify how much these new measures would reduce impacts to sea turtles but they would help reduce such impacts.

The FPEA found that the overall effects of the Preferred Alternative on ESA-listed sea turtles would likely be minor in magnitude, dispersed over a large geographic area, and temporary or short-term in duration and would therefore be considered minor adverse according to the impact criteria in the FPEA.

The FIM BiOp found that Green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles are all likely to be adversely affected by the proposed action, but that critical habitat would not be adversely affected, and the action as proposed, is not likely to jeopardize the continued existence of any ESA-listed species. The GANDR BiOp concluded that Green, Kemp's ridley, and loggerhead sea turtles are likely to be adversely affected by the proposed action. After reviewing the current status of the species, the environmental baseline, the effects of the proposed action, and cumulative effects, it was determined that the proposed action is not likely to jeopardize the continued existence of the NWA DPS loggerhead sea turtle, NA DPS green sea turtle, SA DPS green sea turtle, and Kemp's ridley sea turtle.

ESA-Listed Invertebrates and Plants

Seven invertebrates and one plant species found within the SEFSC region are listed as threatened under the ESA: elkhorn coral (*Acropora palmata*), staghorn coral (*Acropora cervicornis*), pillar coral (*Dendrogyra cylindrus*), rough cactus coral (*Mycetophyllia ferox*), lobed star coral (*Orbicella annularis*), mountainous star coral (*Orbicella faveolata*), boulder star coral (*Orbicella franksi*), and Johnson's seagrass (*Halophila johnsonii*).

NMFS identified nine threats to be the most significant to the current or expected future extinction risk of reef-building corals: ocean warming (bleaching), disease, ocean acidification, trophic effects of fishing, sedimentation, nutrients, sea-level rise, predation, and collection and trade (79 FR 53852). Susceptibility of a coral species can vary greatly between and within taxa, depending on the biological processes and characteristics of each coral species. Details on the species-specific or genera-specific threat susceptibilities of the above ESA-listed corals include:

- *Acropora* spp. (elkhorn and staghorn coral) are highly susceptible to ocean warming, disease, ocean acidification, sedimentation, nutrients, and predation and are susceptible to trophic effects of fishing, compensatory population effects from rapid, drastic declines and low sexual recruitment, and anthropogenic and natural abrasion and breakage.
- *Dendrogyra cylindrus* is susceptible to ocean warming, disease, acidification, nutrient enrichment, sedimentation, and trophic effects of fishing.

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- *Mycetophyllia ferox* is highly susceptible to disease and is susceptible to ocean warming, acidification, trophic effects of fishing, nutrients, and sedimentation.
 - *Orbicella* spp. are highly susceptible to ocean warming, disease, ocean acidification, sedimentation, and nutrients and are susceptible to trophic effects of fishing.

Johnson's seagrass has a limited ability to disperse and colonize habitats because of its asexual reproduction and dependence on substrate stability. Threats for this species include boating impacts such as propeller scarring of the substrate, anchoring, and mooring; dredging; storm action and sedimentation; and degraded water quality.

Designated critical habitat for elkhorn and staghorn coral overlaps SEFSC research areas, but not in areas where bottom trawl or dredge surveys occur. ESA-listed coral species have not been caught by SEFSC-affiliated research surveys in the past five years (2008-2012) and are unlikely to be caught in the future. Bottom trawls and dredge surveys do have the potential to injure individual coral species. Johnson's seagrass (*Halophila johnsonii*) also occurs within SEFSC research areas and is listed as threatened under the ESA. Designated critical habitat only exists in portions of the Indian River Lagoon and Biscayne Bay, FL. SEFSC surveys in these areas are limited to SCUBA divers and trap gear, where impact to substrate is minor and short in duration. Seagrass shoot density of other species (*Thalassia testudinum* and *Syringodium filiforme* in the Florida Keys) has been shown to only begin to decline after being covered by traps for 6 weeks or longer (Uhrin et al. 2005). The FPEA determined that the potential effects of the Preferred Alternative on the above ESA-listed species would be negligible.

The FIM BiOp found that the gear types and techniques used during FIM research (i.e., hook-and-line or trawl sampling, fish traps, underwater cameras, visual surveys, dip nets, seines/gillnets, electrofishing, or artificial habitat aggregation devices) will not adversely affect ESA-listed corals or Johnson's seagrass.

10) Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?

Conducting the SEFSC fisheries and ecosystem research activities would not violate any federal, state or local laws for environmental protection. SEFSC has consulted with appropriate federal, state, and local agencies as well as other entities during the development of the FPEA to ensure that the fisheries and ecosystem research program is compliant with applicable statutes including the MMPA, ESA, NEPA, and MSA. Applicable laws and consultation efforts are summarized in Chapter 6 of the FPEA.

11) Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined under the Marine Mammal Protection Act

Potential effects of fishery research vessels, survey gear, sonar and other active acoustic devices, and other associated equipment on marine mammals include:

- Changes in food availability due to research removal of prey and discards
- Contamination from discharges

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- Disturbance and behavioral changes due to acoustic equipment
 - Injury or mortality due to ship strikes
 - Injury or mortality due to entanglement/hooks in gear.

Potential direct and indirect effects of SEFSC research activities on marine mammals have been considered for all gear used in research under the Preferred Alternative. Given the very small amounts of fish and invertebrates removed from the ecosystem during scientific sampling, the dispersal of those sampling efforts over large geographic areas, and the short duration of sampling efforts, the overall risk of causing changes in food availability for marine mammals is considered minor adverse. Also, given the crew training, required emergency equipment, and adherence to environmental safety protocols on NOAA research vessels and NOAA chartered vessels, the risk of altering marine mammal habitat through contamination from accidental discharges into the marine environment is considered minor adverse.

All species may be exposed to sounds from active acoustic equipment used in SEFSC research, although several acoustic sources are not likely audible to many species. Those that are audible would likely cause temporary and minor changes in behavior for nearby animals as the ships pass through a given area. The potential for temporary threshold shifts in hearing is low for high frequency cetaceans (pygmy and dwarf sperm whales and harbor porpoise) and very low to zero for other species, particularly low frequency cetaceans. The potential for hearing loss or injury to any marine mammal is essentially zero. Because of the minor magnitude of effects and temporary duration of acoustic disturbance, the overall effects of acoustic disturbance are considered minor adverse for all species throughout the SEFSC research areas.

Bottlenose dolphins are the only marine mammal species historically caught from 2002 to 2015 in SEFSC research gear. In addition, the complex stock structure, delineation, and minimal abundance information for the 54 bottlenose dolphin stocks in the SEFSC research areas necessitated analysis of potential takes and impacts separately for this species. The estimated annual average potential takes for most stocks for which PBR is known and takes are requested would be at or below 10 percent of PBR and would be considered to have minor magnitudes of effect at the population level; the remainder could have average annual takes between 10 percent and 20 percent of PBR and, if such takes occurred, would be considered of moderate magnitude. The lack of recent population information for many stocks prevents a quantitative assessment of the potential impact of requested takes for stocks with undetermined PBR. If new population estimates for one or more stocks of bottlenose dolphins are developed in the future, NMFS will consider the potential impacts of its ongoing fisheries and ecosystem research program and requested take authorizations on an adaptive management basis, including the potential for additional mitigation measures as necessary.

Historic take data and other data on mortalities in commercial fisheries using similar gear were used to estimate potential takes (combined Level A harassment and serious injury and mortality) in the next five years, which include a suite of mitigation measures implemented for SEFSC surveys. Future takes, if they occur, would likely be fewer than that estimated since estimates are based on a precautionary approach to ensure accounting for a maximum amount of potential take. The annual average number of requested takes for most non-bottlenose dolphin species in the ARA and GOMRA are less than 10 percent of PBR and would be considered to have minor effects at the population level

in terms of magnitude. The exception is for rough-toothed dolphins, where the requested take, including an assigned take for “undetermined delphinids”, would be moderate in magnitude. PBR is undetermined for CRA species so no quantitative assessment of potential impacts is possible. Adverse interactions with research gear would likely continue to occur rarely but could occur anywhere the SEFSC conducts fisheries and ecosystem research; impacts would likely be dispersed over time and space.

The overall effects of the Preferred Alternative on marine mammals would be minor to moderate in magnitude and dispersed over a large geographic area. Non-mortality impacts would be temporary or short-term in duration and would therefore be considered minor to moderate adverse according to the impact criteria in the FPEA.

12) Can the proposed action reasonably be expected to adversely affect managed fish species?

Most research activities conducted by the SEFSC are multi-species surveys that cover large areas, involve minimal sampling, and do not target overfished species. Research catches in these surveys are generally very small for uncommon species. None of the projects are focused on a particular species or group of fish so the impact of research on overfished stocks is not expected to interfere with rebuilding plans for those stocks. Overall, the impact of SEFSC research on target and bycatch fishes under the Preferred Alternative is considered minor adverse according to the impact criteria described in the FPEA.

Research data is necessary for monitoring the status of overfished stocks and other stocks of conservation concern and to determine if management objectives for rebuilding those stocks are being met. Under the Preferred Alternative, proposals for scientific research projects must go through a rigorous process to get scientific research permits or experimental fishing permits. The potential impacts of those proposed projects are assessed for each stock, including overfished stocks, before those permits are issued. Fisheries managers typically consider the estimated amount of research catch from all projects along with other sources of mortality (e.g., bycatch in other fisheries and predation) before setting commercial fishing limits to prevent overfishing of stocks or to help overfished stocks rebuild. This type of annual review of research proposals would continue to occur in the future under the Preferred Alternative. Any future proposed projects targeting overfished stocks, or projects likely to have substantial bycatch of an overfished stock, would receive additional scrutiny on a stock by stock basis to ensure minimal impact on the stock before a research permit is issued. These permitting reviews would also determine whether the proposed projects were consistent with the NEPA analysis presented in this FPEA or whether additional NEPA analysis was required. Tables 4.2-9 and 4.2-10 of the FPEA indicate that while mortality to fish species is a direct effect of the SEFSC ARA surveys, measurable population changes are not expected to occur as a result of these research activities because they represent such a small percentage of allowable quota in commercial and recreational fisheries, which in turn are just fractions of the total populations for these species. For all target species in the Southeast region, mortality from SEFSC research activities would be low in magnitude, dispersed over a wide geographic area, and therefore considered minor adverse for all target species.

For most species targeted by commercial fisheries and managed under Fishery Management Plans, mortality due to research surveys and projects is much less than one percent of Annual Catch Limits (ACLs) or commercial and recreational harvest and is considered to be minor in magnitude for all species. For a few species which do not have a large commercial market due to various market conditions or past overfishing, the research catch exceeds one percent of commercial catch but is still small relative to the population of each species and is considered minor in magnitude. Proposed research projects that target stocks that are overfished or where overfishing is occurring are reviewed annually before research permits are issued to determine if they would conflict with rebuilding plans or present other conservation concerns. For highly migratory species (almost exclusively sharks) and species that are not managed under FMPs, research catch is also relatively small and considered to be minor in magnitude for all species. Mortality for all species would be distributed across a wide geographic area rather than concentrated in particular localities. Disturbance of fish and benthic habitats from research activities would be temporary and minor in magnitude for all species. As described above, the potential for accidental contamination of fish habitat is considered minor in magnitude and temporary or short-term in duration. The overall effects of the Preferred Alternative on non-ESA-listed fish would be minor in magnitude, distributed over a wide geographic area, and temporary or short-term in duration and would therefore be considered minor adverse according to the criteria in the FPEA.

In contrast to these adverse effects, SEFSC research also provides long-term beneficial effects on managed fish species throughout the Southeast region through its contribution to sustainable fisheries management. Data from SEFSC-affiliated research provides the scientific basis to reduce bycatch, establish optimal fishing levels, prevent overfishing, and recover overfished stocks. The beneficial effects of the time-series data provided by SEFSC research programs effects are especially valuable for long-term trend analysis for commercially harvested fish and, combined with other oceanographic data collected during fisheries and ecosystem research, provide the basis for monitoring changes to the marine environment important to fish populations.

13) Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

Adverse effects on EFH and HAPC would occur from the use of bottom-contact research gear under the Preferred Alternative. Changes to the resource would be small but measurable, would cover a small geographic area, and would most likely be temporary or short-term in duration, although impacts on sensitive benthic substrates, should they occur, may last several years. The overall effects of the Preferred Alternative on EFH and HAPC would be considered minor adverse according to the impact criteria provided in the FPEA. In a concurrence letter dated Sept. 18, 2017, NMFS determined that the fisheries and research surveys and projects conducted by the SEFSC and cooperating research partners as described in the PEA are authorized for FFH General Concurrence.

14) Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

Dredges and other bottom-contact gear can cause damage to organisms that produce structure, for example, oysters and corals. In addition, bottom-contact research activities can suspend large

quantities of sediment that could smother structure building organisms. Oysters and corals create reef structures which provide interstitial spaces for small invertebrates and fish to live. They also create habitat for transient and resident fish. Bottom longlines could impact benthic communities in the same manner as lines between fish and lobster traps; during recovery the line may sweep the sea floor before rising off the bottom, dislodging objects and impacting hard corals. Effects of SEFSC research programs on seafloor organisms that produce structure would be considered minor adverse due in part to the small areal extent of surveys using bottom trawl. Such impacts would be limited to the GOMRA and ARA because the SEFSC does not use bottom trawl gear in the CRA. Direct and indirect effects resulting from the removal of organisms that produce structure would be localized, short-term in duration, and would result in small but measurable changes. Overall, impacts to seafloor structural organisms in the SEFSC research areas would be considered minor adverse under the Preferred Alternative according to the criteria in the FPEA.

SCUBA surveys have the potential to physically damage infauna, epifauna, and seagrasses through incidental contact. However, the use of highly qualified divers, extensive dive training, and adherence to best practices designed to minimize unnecessary contact with benthos diminish the likelihood of any potential incidental effects to infauna, epifauna, and seagrasses.

Fishing gear that contacts the seafloor can disturb infauna and epifauna by crushing, burying, removing, or exposing to predators, and thus can reduce complexity and species diversity. As described in the FPEA, trawling can also bury shoots, leaves, and flowering structures of coastal seagrasses. Once buried, the leaves of seagrasses can no longer function, which diminishes their ability to grow and reproduce. Since many research surveys are not conducted in fixed locations every year, the potential for repeated disturbance to any specific area is very low. Fish traps and underwater camera arrays may cause abrasion or fragmentation if they contact coral colonies or other benthos, but they are lowered to the bottom (not dropped) and are not intentionally deployed directly atop of known reef habitats. Furthermore, bottom trawl surveys are only conducted on suitable benthic substrates, e.g. sand, silt or gravel bottoms with few large rocks or sharp surfaces that may damage the gear. Rocky areas that are more likely to support corals and other epifauna are generally avoided by using sonar to examine the bottom contours before surveys are conducted. Prior to leaving the dock, buffers are established for benthic areas determined to be sensitive and unsuitable for bottom trawl surveys. Given these practices, catch of corals from bottom trawling has been infrequent (total catch less averaging less than 50 kg per year, with no ESA-listed corals caught) and limited in geographic scope. Therefore, the magnitude and geographic extent of potential physical damage to vulnerable marine and coral reef ecosystems due to SEFSC research activities would be considered minor.

15) Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

Actions associated with the Preferred Alternative are not expected to significantly adversely affect biodiversity or ecosystem function within the affected environment. The sampling and removal of species targeted by, and incidental to, research activities is limited in scope and duration, and occurs within large areas of open ocean. Studies focusing on ecosystem research are essential to the management of commercial fisheries. Long-term, predictable marine research provides information

on changes to, and trends regarding, the marine ecosystem that must be considered by fisheries managers. Development of ecosystem management methods is beneficial to overall ecosystem function.

16) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

The proposed SEFSC research activities are not reasonably expected to result in the spread or introduction of non-indigenous species. The research involves movement of vessels between water bodies. However, ballast water management and other discharge processes for NOAA and charter vessel operations are bound by federal laws, regulations and Executive Orders (EO) that are in place in order to prevent or minimize the potential for spread or introduction of non-indigenous species, including the Clean Water Act, National Invasive Species Act, Nonindigenous Aquatic Nuisance Prevention and Control Act, and EO13112.

Determination

In view of the information presented in this document and the analysis contained in the supporting FPEA prepared for fisheries and ecosystem research conducted and funded by the Southeast Fisheries Science Center, it is hereby determined that continuation of the SEFSC fisheries and ecosystem research program will not significantly impact the quality of the human environment. In addition, all beneficial and adverse impacts of the SEFSC fisheries and ecosystem research program have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

Science and Research Director
Southeast Fisheries Science Center

Date