

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Ocean Energy Management
Office of Renewable Energy Programs

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**Guidelines for Providing Information on Fisheries for Renewable
Energy Development on the Atlantic Outer Continental Shelf
Pursuant to 30 CFR Part 585**

I. Purpose

Before the Bureau of Ocean Energy Management (BOEM) in the U.S. Department of the Interior (DOI) will approve the siting of a facility proposed for a renewable energy project on the Outer Continental Shelf (OCS) in the Atlantic Ocean, a lessee must submit the results of its site characterization surveys to BOEM with its Site Assessment Plan (SAP), Construction and Operations Plan (COP), or General Activities Plan (GAP). The purpose of this guidance document is to provide recommendations to lessees and grant holders for complying with the information requirements in 30 CFR Part 585 Subpart F, “Plans and Information Requirements.” This guidance document supersedes and replaces the previous guidance entitled, “Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf Pursuant to 30 CFR Part 585,” dated June 19, 2019, and will remain in effect until cancelled.

BOEM requires the results of site characterization studies to evaluate the impact of proposed activities on physical, biological, and socioeconomic resources, as well as to evaluate the seafloor and sub-seafloor conditions that could be affected by the construction, installation, and operation of meteorological towers, buoys, cables, wind turbines, and supporting structures. BOEM, other Federal agencies, and potentially affected states will use the information to: prepare environmental analyses to comply with the National Environmental Policy Act (NEPA); conduct interagency consultations for purposes of complying with other applicable laws, such as section 7 of the Endangered Species Act (ESA); and meet other statutory and regulatory requirements. Lessees and grant holders should communicate with BOEM early in the survey planning process and adhere to these guidelines to ensure that BOEM’s information needs are met. Survey results obtained through procedures consistent with these guidelines should be sufficient for BOEM’s decision-making process. BOEM may include stipulations in leases and grants that require lessees and grant holders to submit a SAP survey plan, COP survey plan, or GAP survey plan, and schedule a pre-survey meeting with BOEM to discuss the plan prior to conducting survey activities in the lease or grant area. We note that, in these guidelines, when BOEM refers to lessees, it should be assumed that it is also referring to grant holders.

Site characterization activities in this document refer only to fisheries surveys, which include finfish and shellfish. BOEM provides recommendations for conducting and reporting the results of other baseline collection studies in separate guidelines: <https://www.boem.gov/Survey-Guidelines/>. These guidelines may be updated periodically as new information or methodologies become available.

The overall purpose of the information required per the regulations is to describe the key species and habitat within the survey area that might be possibly affected by the proposed operations. The fisheries survey plan should aim to:

- Identify and confirm which dominant benthic, demersal, and pelagic species are using the project site, and the season(s) these species may be present where development is proposed;
- Establish a pre-construction baseline that may be used to assess whether detectable changes associated with proposed operations occurred in post-construction abundance and distribution of fisheries;
- Collect additional information aimed at reducing uncertainty associated with baseline estimates and/or to inform the interpretation of research results; and
- Develop an approach to quantify any substantial changes in the distribution and abundance of fisheries associated with proposed operations.

For all projects, the lessee should also describe in its SAP, COP, or GAP the measures it plans to take to minimize or eliminate potential impacts to fishery resources. In addition, for projects involving the installation of wind energy turbines on the Atlantic OCS, the lessee should prepare a fisheries survey plan that describes its methods for collecting sufficient information about the biology of the project area to allow BOEM and other agencies with jurisdiction to make well-founded decisions in the context of the regional biology.

II. Statutory Authority and BOEM Regulations

BOEM has statutory obligations under the Outer Continental Shelf Lands Act (43 USC 1337(p)) to protect the environment and conserve the natural resources of the OCS. Additionally, BOEM has statutory obligations under NEPA, ESA, and the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA). Under BOEM's regulations, a plan (SAP, COP, or GAP) must describe biological, social, and economic resources that could be affected by the activities proposed in the SAP, COP, or GAP (see SAP – 30 CFR 585.610(b)(5), 585.611(a),(b)(3), (5) and (7); COP – 30 CFR 585.626(a)(3), 585.627(a)(3), (5), and (7); and GAP – 30 CFR 585.645(a)(5), 585.646(b)(3)-(5)).

These guidelines are meant to clarify and provide a general understanding of the information that BOEM requires so that it can adequately assess the potential impacts of offshore renewable energy projects on biological, social, and economic resources and to support development of assessments to support consultations with NOAA's National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). BOEM will review the submitted SAP, COP, or GAP and associated information to determine if it contains the necessary information to allow BOEM to conduct its technical and environmental reviews. Upon completion of BOEM's technical and environmental reviews, BOEM may approve, approve with modifications, or disapprove the submitted SAP, COP, or GAP.

III. Early Coordination with BOEM

BOEM recommends that the lessee meet with BOEM early in the survey planning process to discuss BOEM's potential information needs. Early coordination allows for BOEM and the lessee to discuss common goals and expectations prior to mobilization of a fisheries survey. Maintaining early and open dialogue between BOEM and the lessee is critical to the timely and comprehensive execution of a fisheries survey. BOEM recommends that the lessee work closely with BOEM staff to arrive at a strategy that meets overall requirements and tailors the fisheries survey to site-specific needs of the area (e.g., determination of species of interest within the lease area), including identification of information sources that may alleviate the need for certain additional surveys. The lessee should also engage in discussions with other agencies (e.g., NMFS, USFWS, U.S. Army Corps of Engineers) and concerned parties as early as possible to help resolve potential issues that may arise. Note that additional consultations or permitting may be necessary to carry out certain types of site characterization surveys, particularly those that may interact with protected species and that these consultations or permitting can require several months; it is critical that the lessee build adequate time into the survey timeline to account for this additional consultation or permitting.

For fisheries survey plan development, BOEM strongly encourages lessees to engage in outreach to potentially affected fishing groups. Individual state fishery management agencies and regional fishery management organizations may assist in facilitating this coordination. In the event the lessee and an agency disagree with respect to the survey plan, it is the lessee's obligation to resolve any issues that may arise. The lessee is advised to resolve any technical issues that may be in dispute with other agencies or fishing groups prior to submitting their final plans to BOEM. BOEM may determine it is prudent for a lessee to resurvey some or all of the lease area in the event survey results are insufficient.

BOEM recommends that the lessee submit a fisheries survey plan with its SAP, COP, or GAP survey plan. BOEM will coordinate with appropriate natural resource agencies to ensure that data and analyses adequately meet regulatory requirements. However, BOEM is not responsible for designing the survey. The survey specifications that the lessee includes in its plan should include a description of the issues to be investigated, hypotheses tested, assumptions in the survey design, the data collection techniques that will be used, analytical and statistical techniques that will be used, and the quality control that the lessee will use in conducting the survey.

Fisheries surveys may be conducted simultaneously with other site characterization surveys. However, it should be noted that this may not always be appropriate, and each survey should be designed to meet the specific objectives of the survey type. The layout of the survey will likely depend on the site to be assessed. Permits and/or additional consultation pursuant to the Marine Mammal Protection Act or the ESA may be required by NMFS and/or USFWS for activities that may affect protected species, including surveys that result in the capture and release of live

animals. For additional information on these requirements, please contact NMFS¹ and/or USFWS.² NMFS can also provide information on the Exempted Fishing Permits and Letters of Acknowledgement.³ It is the lessee's responsibility to obtain the necessary permits before beginning survey activities.

BOEM strongly recommends that the lessee participate in a pre-survey meeting with BOEM. This meeting may include, but is not limited to, discussions regarding:

- applicability of existing data;
- survey logistics (proposed survey area, dates, times, survey period length, weather limitations, etc.);
- field techniques and equipment to be utilized/specification of data acquisition systems;
- data to be acquired;
- data processing and analysis; and
- data and information to be submitted.

IV. Survey Methodology

A fisheries survey plan that addresses constituent concerns is an important first step towards a successful biological survey. Constituents could include participants in commercial and recreational fisheries, NMFS, and state natural resource agencies. In developing a fisheries survey plan, a review of previous investigations, such as fishery independent and fishery dependent data collections, can be helpful to a lessee in selecting equipment and in choosing the sampling and analytic approaches.

The survey methods described in Tables 1-3 were derived from “Developing Environmental Protocols and Modeling Tools to Support Renewable Energy and Stewardship” (McCann, 2012) to assist in determining the most appropriate protocols for the proposed project:

(<https://espis.boem.gov/final%20reports/5208.pdf>). In March 2021, the Responsible Offshore Science Alliance⁴ (ROSA) worked with state, Federal, and fisheries constituents to develop the Offshore Wind Project Monitoring Framework and Guidelines document (<https://www.rosascience.org/offshore-wind-and-fisheries-resources/>). This document is an important resource in understanding necessary considerations in developing pre-construction, construction, and post-construction monitoring surveys.

The survey types listed in this guidance document and in the ROSA guidance document are standard methods for fisheries surveys but are not required components of a fisheries survey plan. Rather, a fisheries survey plan should be developed using the methods that are appropriate to meet the objectives of the plan while reducing risk to protected species from the survey activities, including the use of survey methods that avoid the potential for capture or collection of protected

¹ <https://www.fisheries.noaa.gov/topic/consultations>
https://www.fisheries.noaa.gov/insight/understanding-permits-and-authorizations-protected-species#for_what_activities_does_noaa_fisheries_issue_permits

² <https://www.fws.gov/service/section-7-consultations>

³ <https://www.fisheries.noaa.gov/new-england-mid-atlantic/sustainable-fisheries/scientific-research-and-exempted-fishing-permits>

⁴ www.rosascience.org

species or disruption of their habitat. Importantly, there are a growing number of non-lethal sampling methodologies (see Table 5) that could reduce the negative impacts that may occur from more traditional sampling methodologies. Lessees are encouraged to collaborate with other lessees, research institutions, and state and Federal natural resource agencies to accomplish their site characterization objectives for SAP, COP, or GAP submittal to BOEM.

Lessees are encouraged to use existing data where applicable to their proposed activities and associated area of potential adverse effect to characterize the natural resources present. If collection of new information is necessary to fulfill an information need, then the amount of new information collected should match the scale and/or complexity of the proposed project. For example, a commercial-scale wind energy project may need additional site-specific information and surveys to characterize the fishery resources in the area prior to the submittal of a COP. In contrast, for a SAP that proposes the installation of a standard floating light detection and ranging (FLiDAR) buoy, information would likely only be needed to broadly characterize fishery resources in the area and site-specific fisheries surveys would not likely be necessary due to the small footprint and temporary nature of the buoy deployment.

Potential adverse effects are generally defined as impacts from all phases of the proposed activities that may reduce the quality and/or quantity of the fisheries resources. The area of potential adverse effect is the geographic area or areas within which such activities may take place and that may cause adverse changes in the character or use of any natural resources present. Throughout this document, the term “project area” is generally used to describe the project footprint and surrounding areas that may be impacted. In practice, the lessee should identify the reasonably foreseeable effects associated with their proposed activities and ensure that a description of the biological resources that could be affected by those activities are included in their survey plans.

In recent environmental impact statements for offshore wind energy COPs, BOEM has identified several impact producing factors that may potentially impact to fishery resources. Impact producing factors to fishery resources that should be considered when designing the survey include the impacts from: accidental releases of materials or invasive species, anchoring, electromagnetic fields, cable emplacement and maintenance, noise, lighting, the presence of structures, seabed profile alterations, port utilization, sediment deposition and burial, and climate change. The survey protocols in this document (Tables 1-4) are designed to provide information to support the assessment of these potential impacts, including development of potential mitigation measures. BOEM also recognizes that some site assessment activities, such as the installation of a moored FLiDAR buoy, may have negligible impact or perhaps even no impact to fishery resources. In such cases, site-specific fisheries survey results would likely not be necessary. The choice of which protocols to use should be defined by the objectives of the survey, availability of existing information, and characteristics of the project area. Each site and the potential effects from the types of activity anticipated in a SAP, COP, or GAP should be considered in selecting the appropriate protocols.

Gear types that may be used for fisheries surveys have the potential to interact with various protected species. In addition to considerations related to the gear itself, in assessing the risk of an interaction, the level of risk is affected by changes in the following factors:

- (1) The temporal and spatial overlap of the gear and a protected species;
- (2) The quantity of gear in the water (e.g., number of vertical lines, gillnets, bottom trawls); and,
- (3) The gear soak or tow duration.

In general, any proposed survey that would result in an increase to any of the above factors elevates the interaction risk to protected species. Given this, the above factors are important to consider in the development of any proposed survey. Specifically, to the maximum extent practicable, the survey activities should minimize the amount of gear fished (i.e., set or towed), gear soak or tow duration, and the spatial and temporal overlap with protected species. All fisheries surveys must comply with current and relevant regulations, including the Atlantic Large Whale Take Reduction Plan (50 CFR 229.32), Harbor Porpoise Take Reduction Plan (50 CFR 229.33 and 229.34), and Bottlenose Dolphin Take Reduction Plan (50 CFR 229.35) regulations.

Tables 1 - 4 outline the protocols for the type of recommended fisheries surveys described in this document: trawl, gillnet/trammel net, otter and beam trawl, ventless trap/pot, and benthic community composition. Not all survey types and gear types will be appropriate to each location. The gear and survey types should be selected based on the issues of greatest concern. The commercial fishing industry should be consulted on the type of gear used. **Note that while these tables include measures that may reduce risk to protected species, compliance with these measures is not a substitute for any necessary consultations or permits.**

Table 1. Recommended Otter Trawl Survey Protocols

Focus	Establishment of pre-construction baseline data on the mesoscale distribution and abundance of fish species in the area of potential effect resulting from activities in a SAP, COP, or GAP.
Methodology	<p>Otter Trawl Survey Components</p> <ul style="list-style-type: none"> • Before/After Control Impact (BACI) design principles to establish multiple control locations outside of the project area. • Control sites selected from areas with similar bathymetry and bottom type to the area of potential effect. • Trawl locations from random station grid. • Pre-construction trawl locations and paths that will be consistent with locations and paths during construction and post-construction. • Random stratified surveys selected from the following stratification: 10 sites within 0.5 km of renewable energy site; 10 sites between 0.5-2.5 km of renewable energy site; 10 control sites (at greater than 2.5 km from site), habitat type, and depth. • Sampling of all fish species, with particular attention to commercially, recreationally, and ecologically important species • Subsamples of species weight and length • Use of a one-inch knotless cod end liner. • Trawl speed of 2.9 – 3.3 knots. • Trawl duration of no more than 20 minutes (depending on the size of the net). • Stomach content analysis of sampled commercially important fish. • Minimum number of trawls per survey period should be determined by power analysis to detect change
Methodology for Analyzing data	<ul style="list-style-type: none"> • Analysis of variance (ANOVA) on numbers of individuals, size and weight distribution; multivariate analysis of catch/community composition, multidimensional scaling, cluster analysis. • Prey items from stomach content identified to lowest taxonomic level, counted, and weighed.
Timing	<ul style="list-style-type: none"> • 2 years of surveys a minimum of four times per year (one each in spring, summer, fall, and winter).
Other Considerations (e.g., Advantages or Disadvantages)	<ul style="list-style-type: none"> • Trawl survey should sample mostly demersal species rather than pelagic species. This survey should be limited to those species most prone to be caught in the net, and should under-sample some species, e.g., lobsters and crabs. • The commercial fishing industry should be involved in data collection and survey design when feasible, including the selection of trawl stations.

	<ul style="list-style-type: none"> • The trawl survey design should account for seasonal and annual variability.
Data Elements	<ul style="list-style-type: none"> • Total individuals per area (catch per unit effort); • Total biomass per area; • Number of individuals per species and area (catch per unit effort); • Biomass per species and area; • Species diversity, species richness. • Length frequency distribution of dominant species; and • community dynamics (changes in community structure and composition over time)
Data Output	<p>Spatial data should be submitted in accordance with the Spatial Data Submission Guidelines found on BOEM's Offshore Renewable Energy Program website:</p> <p>https://www.boem.gov/Survey-Guidelines/</p>
Additional Measures in Areas/Times where Protected Species Occur	<ul style="list-style-type: none"> • At least one of the survey staff onboard should have completed training (within the last 5 years) in protected species identification and safe handling. • All trawl tows should be limited to no more than 20 minutes. • If any protected species (including birds) are captured, they should be immediately released, and the incident should be reported in accordance with protected species reporting requirements to NMFS and BOEM. • All trawl survey activities must comply with relevant Take Reduction Plan regulations. • Refer to the Atlantic Trawl Take Reduction Strategy⁵ for additional measures to reduce the risk of interactions between small cetaceans and trawl (bottom or mid-water) gear.

⁵<https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-trawl-take-reduction-team>

Table 2. Recommended Gillnet and Trammel Net Survey Protocol

Focus	Establish pre-construction baseline data on the micro-scale distribution, abundance, and composition of fish species in the area of potential effect resulting from activities in a SAP, COP, or GAP.
Methodology	<p>Gillnet or trammel net surveys</p> <ul style="list-style-type: none"> • Install at a minimum of three locations within the footprint of the renewable energy facility, and three reference locations in similar habitat, no less than 1 kilometer (km) from footprint sites. • Survey area can be expanded to include cable route, particularly when electro/magneto-sensitive species (e.g., elasmobranchs) are of concern. <p>May include stomach content analysis of sampled commercially important fish.</p> <p>Initial stratification should be based upon habitat type and depth.</p>
Methodology for Analyzing data	<ul style="list-style-type: none"> • ANOVA on number of species, number of fish, multivariate analysis of fish community characteristics (Primer-E), multidimensional scaling, and cluster analysis. • Prey items from stomach content identified to lowest taxonomic level, counted, and weighed.
Timing	Conduct 2 years of area of potential effect (APE)-based gillnet or trammel net surveys a minimum of six days per year, three deployments each spring and fall for 1-2 days each.
Other Considerations (e.g., Advantages or Disadvantages)	<ul style="list-style-type: none"> • Gear type(s) used for the survey should depend on the fish species under consideration (commercially/recreationally important species, species of conservation importance), and the gear type that will be most effective in assessing changes to the abundance and distribution of these species on a fine scale. • Gillnet surveys will result in an under-sample of demersal species but can sample pelagic species, which are difficult to sample by other means. • Gillnets are fairly size-selective and will not provide a good estimate of overall biomass of the area. • Combining gillnet with trawl surveys can account for a larger spectrum of fish species.

	<ul style="list-style-type: none"> ● Trammel nets can capture more fish than gillnets and will provide a greater picture of size distribution. ● Trammel nets can be highly destructive to bottom habitat and should be checked or removed frequently. ● Passive nets can be deployed much closer to the devices than active trawling. ● Sampling design should account for seasonal and inter-annual variability.
Data Elements	<p>Gillnet/trammel net</p> <ul style="list-style-type: none"> ● Catch per unit effort. ● Number of individuals per species and area; ● Species diversity, species richness; and ● Fish length frequency distribution of dominant and/or vulnerable species.
Data Output	<ul style="list-style-type: none"> ● Time series values for number of individuals, biomass, fish community composition, and species-specific length frequency. ● Presence/absence of non-native species. ● Tabular and geospatial datasets. ● Spatial data should be submitted in accordance with the Spatial Data Submission Guidelines found on BOEM's Offshore Renewable Energy Program website: https://www.boem.gov/Survey-Guidelines/
Additional Measures in Areas/Times where Protected Species Occur	<ul style="list-style-type: none"> ● At least one of the survey staff onboard should have completed training (within past 5 years) in protected species identification and safe handling. ● Adequate gear for disentanglement (i.e., knife and boathook) should be onboard. ● In the event that any marine mammal or sea turtle is entangled in survey gear, the NMFS stranding hotline should be contacted immediately. ● Priority should be given to the release of any protected species that are captured in the gear being used, if conditions at sea are safe to do so. All gear should be removed from the water between survey periods, as well as at the end of each survey season. Additionally, per Atlantic Large Whale Take Reduction Plan regulations, in the Northeast Region, all gear must be hauled out of the water at least once every 30 days.

	<ul style="list-style-type: none"> • Gear should be uniquely marked to distinguish it from other commercial or recreational gear. Gear markings: Using paint (color(s) specified by NMFS), place a 3-foot-long mark within 2 fathoms of the buoy. In addition, place 3 additional 12-inch marks on the top, middle and bottom of the line using paint or woven tracer. Gear marking colors will be provided by NMFS and are distinct from gear markings used in other fisheries. • All gillnet soaks should be limited to 24 hours or less to reduce the potential for serious injury and mortality of entangled sea turtles and sturgeon. • All gillnet gear must be in compliance with the Atlantic Large Whale Take Reduction Plan⁶, Bottlenose Dolphin Take Reduction Plan⁷, and the Harbor Porpoise Take Reduction Plan⁸ • To reduce the risk of serious injury and mortality to North Atlantic right whales, 1700 lbs breaking strength buoy lines should be used for gillnet gear if feasible. This can be accomplished by using a) whole buoy line with a breaking strength of 1700 lbs; or b) buoy line with weak inserts that result in the line having an overall breaking strength of 1700 lbs. Specifically, the number and placement of weak inserts should be consistent with the specifications provided by the Atlantic Large Whale Take Reduction Plan. • All gillnet survey activities must comply with relevant Take Reduction Plan regulations.
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⁶ <https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan>

⁷ <https://www.fisheries.noaa.gov/national/marine-mammal-protection/bottlenose-dolphin-take-reduction-plan#the-plan>

⁸ <https://www.ecfr.gov/current/title-50/chapter-II/subchapter-C/part-229#229.33>

Table 3. Recommended Beam Trawl Survey Protocol

Focus	Establish pre-construction baseline data on the micro-scale distribution, abundance, and composition of fish species in the area of potential effect resulting from activities in a SAP, COP, or GAP.
Methodology	<p>Beam trawl surveys</p> <ul style="list-style-type: none">● Establish a minimum of three survey stations within the footprint of the installation (between wind turbine foundations - if possible).● Use a recommended 9-foot (ft) beam trawl with 1 inch (in) knotless liner and tows at a minimum of three locations within footprint of renewable energy facility, and three reference locations in similar habitat, no less than 1 km from footprint sites.● Survey area can be expanded to include cable route, particularly when electro/magneto-sensitive species (e.g., elasmobranchs) are of concern. <p>May include stomach content analysis of sampled commercially important fish.</p> <p>Initial stratification should be based upon habitat type and depth.</p>
Methodology for Analyzing data	<ul style="list-style-type: none">● ANOVA on number of species, number of fish, multivariate analysis of fish community characteristics (Primer-E), multidimensional scaling, and cluster analysis.● Prey items from stomach content identified to lowest taxonomic level, counted, and weighed.
Timing	Conduct 2 years of seasonal beam trawl tows (spring, summer, fall, winter).
Other Considerations (e.g., Advantages or Disadvantages)	<ul style="list-style-type: none">● Gear type(s) used for the survey should depend on the fish species under consideration (commercially/recreationally important species, species of conservation importance), and the gear type that will be most effective in assessing changes to the abundance and distribution of these species on a fine scale.● Beam trawls can supplement otter trawls by trawling within an offshore renewable energy installation or between devices to sample within the footprint of a project, where otter trawling may not be feasible.

	<ul style="list-style-type: none"> ● Beam trawls can also sample harder bottom habitats and are more effective at assessing benthic invertebrates (e.g., scallops, lobsters, clams, crabs). ● Sampling design should account for seasonal and inter-annual variability.
Data Elements	<p>Beam trawl</p> <ul style="list-style-type: none"> ● Total individuals and biomass per area; ● Number of individuals and biomass per species and area; ● Diversity of species; and ● Fish length frequency distribution of dominant and/or vulnerable species.
Data Output	<ul style="list-style-type: none"> ● Time series values for number of individuals, biomass, fish community composition, and species-specific length frequency. ● Presence/absence of non-native species. ● Tabular and geospatial datasets. ● Spatial data should be submitted in accordance with the Spatial Data Submission Guidelines found on BOEM's Offshore Renewable Energy Program website: https://www.boem.gov/Survey-Guidelines/
Additional Measures in Areas/Times where Protected Species Occur	<ul style="list-style-type: none"> ● All trawl tows limited to no more than 20 minutes ● At least one of the survey staff onboard should have completed training (within past 5 years) in protected species identification and safe handling. ● Adequate gear for disentanglement (i.e., knife and boathook) should be onboard. ● In the event that any marine mammal or sea turtle is entangled in survey gear, the NMFS stranding hotline should be contacted immediately. ● Priority should be given to the release of any protected species that are captured in the gear being used, if conditions at sea are safe to do so. All gear should be removed from the water between survey periods, as well as at the end of each survey season. Additionally, per Atlantic Large Whale Take Reduction Plan regulations, in the Northeast Region, all gear must be hauled out of the water at least once every 30 days.

Table 4. Recommended Ventless Trap and Fish Trap/Pot Survey Protocol

Focus	Establish pre-construction baseline distribution and abundance of lobster/crab species or some fish species in the APE resulting from activities in a SAP, COP, or GAP.
Methodology	<p>Fixed gear survey with ventless traps and fish traps/pots</p> <ul style="list-style-type: none"> • Use BACI design principles to establish multiple control locations. • Select control locations to have similar bottom types and benthic habitat as project area trawl locations (if conducted). • Set traps within the proposed footprint of renewable energy installation, and at random stratified sites at varying distances from the renewable energy site within and outside of the APE (e.g., 1 km, 10 km, and 25 km). • Initial stratification should be based upon habitat type and depth. • Sample weight and length of species.
Methodology for Analyzing data	ANOVA on numbers of individuals, size and weight distribution; multivariate analysis of catch/community composition.
Timing	Conduct 2 years of seasonal surveys (spring, summer, fall, winter).
Other Considerations (e.g. Advantages or Disadvantages)	<ul style="list-style-type: none"> • Not all survey types and gear types will be appropriate for each location. The gear and survey types should be selected based on the issues of greatest concern. • The gear and techniques used by the commercial fishing industry should be mirrored in the survey design when sampling commercially important fish species. • The commercial fishing industry should be involved in data collection and survey design when feasible. • While ventless trap surveys are often used for crustaceans, they may be useful for species such as black sea bass, rock fish, or other species that are attracted to structures and can be caught by traps or pots. • The sampling design should account for seasonal and annual variability.
Data Elements	<ul style="list-style-type: none"> • Total individuals and biomass per area; • Number of individuals per species and area; • Biomass per species and area; • Fish length frequency distribution of dominant species; and • Catch per Unit Effort at species level.
Data Output	Spatial data should be submitted in accordance with the Spatial Data Submission Guidelines found on BOEM's Offshore Renewable Energy

	<p>Program website:</p> <p>https://www.boem.gov/Survey-Guidelines/</p>
<p>Additional Measures in Areas/Times where Protected Species Occur</p>	<ul style="list-style-type: none"> • Gear should be uniquely marked to distinguish it from other commercial or recreational gear. Gear markings: Using paint (color(s) specified by NMFS), place a 3-foot long mark within 2 fathoms of the buoy. In addition, place 3 additional 12-inch marks on the top, middle and bottom of the line using paint or woven tracer. Gear marking colors will be provided by NMFS and are distinct from gear markings used in other fisheries. • Adequate gear for disentanglement (i.e., knife and boathook) should be onboard. • In the event that any marine mammal or sea turtle is entangled in survey gear, the NMFS stranding hotline should be contacted immediately. • Reduce the number of vertical lines: Minimizing the number of vertical lines can reduce entanglement risk to large whales and sea turtles; this can be accomplished by reducing the number of vertical lines used by reducing the number of traps set, trawling up; or use of ropeless gear. • Avoid deploying this gear type in areas/times where large whales are known to occur. • To reduce the risk of serious injury and mortality to North Atlantic right whales, ropeless technology or 1700 lb breaking strength buoy lines should be used for all trap/pot gear. This can be accomplished by using: a) whole buoy line with a breaking strength of 1700 lb; or b) buoy line with weak inserts that result in the line having an overall breaking strength of 1700 lb. Specifically, the number and placement of weak inserts should be consistent with the specifications provided by the Atlantic Large Whale Take Reduction Plan. All gear should be removed from the water between survey periods, as well as at the end of each survey season. Additionally, per Atlantic Large Whale Take Reduction Plan regulations, in the Northeast Region, all gear must be hauled out of the water at least once every 30 days • All trap/pot gear must in compliance with the Atlantic Large Whale Take Reduction Plan

Table 5. Molluscan Shellfish Surveys

Focus	Pre-construction characterization and delineation of the abundance, diversity, percent cover, and multivariate community composition of the seafloor in the area of potential adverse effect.
Methodology	<p>Physical sampling</p> <ul style="list-style-type: none"> • Hamon grab (hard bottom); • Van Veen grab (soft sediment); and/or • Benthic sled • Dredge (single, double, hydraulic) <p>Benthic imagery (i.e., underwater video or still imagery (soft and hard bottom) and/or sediment profile imaging (SPI)).</p> <p>BOEM recommends using the methods employed by the Environmental Protection Agency's (USEPA) National Coastal Condition Assessment (NCCA), such as the use of a 0.04 m² Ted Young-modified Van Veen grab and 0.5 mm sieve, to facilitate data comparison across regions.</p>
Timing	Conduct 2 years of seasonal surveys (spring, summer, fall, winter).
Scope/Scale	Baseline survey should include an appropriate sample size from the entire area of potential adverse effect, generally not less than one sample per 1-2 km along a proposed line of potential adverse effect or one sample per 1-2 km ² within a proposed area of potential adverse effect. Sampling should address seasonal and inter-annual variability of anticipated benthic communities. Control sites for post-construction monitoring should be identified.
Other Considerations	Special attention should be given to the presence of sensitive benthic habitats. These include areas where information suggests the presence of exposed hard bottoms of high, moderate, or low relief; hard bottoms covered by thin, ephemeral sand layers; seagrass patches; or kelp and other algal beds, as well as the presence of anthozoan species.
Presentation of Results	<ul style="list-style-type: none"> • Tabular and geospatial datasets. • Spatial data should be submitted according to the Spatial Data Submission Guidelines found on BOEM's Offshore Renewable Energy Program website: https://www.boem.gov/Survey-Guidelines/ • When relying on pre-existing data, provide justification for how those data are appropriate for the project's area of potential adverse effect.

Table 6. Non-lethal Sampling Methodologies

Survey Type	Resource
<ul style="list-style-type: none">● Baited Remote Underwater Video Station	<ul style="list-style-type: none">● https://www.fisheries.noaa.gov/inport/item/25248
<ul style="list-style-type: none">● Drop cameras	<ul style="list-style-type: none">● https://espis.boem.gov/final%20reports/5647.pdf
<ul style="list-style-type: none">● Gliders/towed video	<ul style="list-style-type: none">● https://espis.boem.gov/final%20reports/5592.pdf
<ul style="list-style-type: none">● eDNA	<ul style="list-style-type: none">● https://repository.library.noaa.gov/view/noaa/27077

V. Best Practices for Avoiding Protected Species Interactions

The tables above include measures to avoid or minimize interactions between protected species and specific gear types. In addition to those measures, the following best practices are applicable to multiple gear types and should be implemented when conducting fisheries surveys. The below best practices are not meant to replace any specific terms or conditions of a lease or grant. If any of the below best practices conflict with the terms or conditions of the lease or grant, the lessee or grant holder must comply with the terms of its lease or grant. The protected species avoidance measures below, and in the tables above, may be modified through provisions of the Marine Mammal Protection Act and the Endangered Species Act. Lessees are encouraged to discuss their survey plans with BOEM and NMFS if there is any confusion or conflict with these measures.

- Initiate protected species watches (visual observation) at least 15 minutes prior to sampling by scanning the surrounding waters with the naked eye and rangefinder binoculars. If protected species are sighted within 1 nautical mile of the sampling station in the 15 minutes before setting the gear, transit to a different section of the sampling area. Trawl or gillnet gear should not be deployed if protected species are sighted near the survey vessel.
- In all cases, reporting of any interactions with protected species should be complete and timely. BOEM will confirm specific requirements for reporting when reviewing survey plans.
 - Report entangled marine mammals, sea turtles, and/or birds to the appropriate NMFS hotline (see: <https://www.fisheries.noaa.gov/report>).
- Unless human safety would be compromised, there should be reasonable efforts made to recover lost gear within 24 hours. If the gear cannot be retrieved in 24 hours, the gear should be retrieved as soon as it is safe. All lost gear must be reported to DOI in compliance with BOEM and BSEE's incident reporting requirements and procedures.
- In addition to lost gear, all lost or discarded marine trash and debris should be reported to DOI in compliance with BOEM and BSEE's requirements and reporting procedures found in the lessee's lease or grant and/or BOEM's programmatic ESA consultation for data collection activities (<https://www.boem.gov/sites/default/files/documents/renewable-energy/OSW-surveys-NLAA-programmatic.pdf>). BOEM will share this information with NMFS.
- Vessels should travel 10 knots or less in any Seasonal Management Area (SMA), Slow Zone/Dynamic Management Area (DMA).
- All vessel operators should check for information regarding mandatory or voluntary ship strike avoidance (SMAs, DMAs, Slow Zones) and daily information regarding North Atlantic right whale sighting locations. Sightings should not be used as the primary or sole means for avoiding right whales, as they only represent locations where right whales were at one point in time. These media may include, but are not limited to: NOAA weather radio, U.S. Coast Guard NAVTEX and channel 16 broadcasts, Notices to Mariners, the Whale Alert app, or WhaleMap website. The North Atlantic right whale Sighting Advisory System information can be accessed at: <https://apps-nefsc.fisheries.noaa.gov/psb/surveys/MapperiframeWithText.html>. Information about active speed restrictions at: <https://www.fisheries.noaa.gov/national/endangered-species-conservation/reducing-vessel-strikes-north-atlantic-right-whales>.

VI. Survey Results and Supporting Data

To ensure the accuracy and quality of survey results, the following data elements should be provided with the fisheries surveys. However, individual benthic survey plan elements should be discussed with BOEM on a case-by-case basis. All data should be processed, validated, and made available as needed.

- Seasonal presence/absence of threatened or endangered fish listed under the ESA as well as those designated as candidate species or species of concern by NFMS or USFWS should be noted (e.g., certain alosines, sturgeons, elasmobranchs, and salmon). The complete list of protected fish species is found at: <http://www.nmfs.noaa.gov/pr/species/fish/>.
- Seasonal presence/absence of commercially and recreationally important fish and shellfish should be noted. Atlantic coast fishery management plans can be located on the web pages for New England, Mid-Atlantic, and South Atlantic Fishery Management Council, respectively. Additionally, inshore interstate management plans can be found on the Atlantic States Marine Fisheries Commission website (<http://www.asmfc.org/>).
- Presence of prey species for threatened, endangered, and commercially and recreationally important fish and shellfish should be noted.
- Presence of habitat important to life history of present species (e.g., nursery grounds, spawning grounds, feeding grounds, etc.) should be noted. See also essential fish habitat in BOEM's benthic habitat survey guidelines at: <https://www.boem.gov/Survey-Guidelines/>.
- Note the level (e.g., spatial extent, volume, and effort) of commercial and recreational exploitation of fishery resource in the APE.
- Note the migration corridors for fish and crustaceans.

VII. Guidance Document Statement

This guidance document sets forth BOEM's general policy to provide the public with additional information regarding the agency's approach to managing its renewable energy program. While the regulations cited in this guidance do have the force and effect of law and do bind the public and BOEM, this guidance does not have the force and effect of law and does not bind the public or BOEM in any way. Lessees are encouraged to contact BOEM with questions or concerns related to the guidance or to site-specific permitting.

VIII. Paperwork Reduction Act of 1995 Statement

An agency may not conduct or sponsor a collection of information unless it displays a currently valid Office of Management and Budget (OMB) Control Number. OMB has approved the information collection requirements in 30 CFR 585 subpart F under OMB Control Number 1010-0176. This guidance document does not impose any additional information collection requirements subject to the Paperwork Reduction Act of 1995.

IX. Contact Information

For further information or inquiries regarding these guidelines please contact the Office of Renewable Energy Programs at (703) 787-1300 or *renewable_reporting@boem.gov*.

Appendix A. Resources for Fisheries Information on the Atlantic OCS.

See <http://www.boem.gov/Renewable-Energy-Environmental-Studies/> for the most recent list of ongoing and completed studies related to renewable energy.

Fisheries Resources	Links
<p><i>National Marine Fisheries Service (NMFS) Species Information System</i></p> <p>This system provides information on stock status of fishery resources.</p>	<p>https://www.st.nmfs.noaa.gov/sisPortal/sisPortalMain.jsp</p>
<p><i>NMFS Fishery Independent Survey System</i></p> <p>Currently under development and will include NMFS survey data when complete.</p>	<p>https://www.fisheries.noaa.gov/resource/tool-app/fishery-independent-survey-system</p>
<p><i>NMFS Fisheries Statistics</i></p> <p>NMFS query system for commercial and recreational landings by species, by port, and by fishing gear.</p>	<p>https://www.st.nmfs.noaa.gov/st1/index.html</p>
<p><i>Atlantic Coast Cooperative Statistics Program</i></p> <p>Regional commercial and recreational fishing harvest data portal.</p>	<p>www.accsp.org</p>
<p><i>NMFS Vessel Trip Report Data</i></p> <p>NMFS fishery dependent vessel trip report data (including area-based catch information) is available by request from the NMFS Northeast Regional Office (Maine-Virginia) and the NMFS Southeast Fisheries Science Center (Virginia-Florida).</p>	<p>The Northeast contact is: Fisheries Statistics Office (978-281-9133; FSO.Data.Request@noaa.gov)</p> <p>NMFS Southeast Fisheries Science Center (305) 361-4581</p>
<p><i>NMFS Fishery Independent Survey Data</i></p>	<p>https://www.fisheries.noaa.gov/topic/population-assessments</p>
<p><i>NMFS Essential Fish Habitat Mapper</i></p> <p>This tool shows where essential fish habitat is located and the species utilizing the habitat.</p>	<p>https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper</p>
<p><i>South Atlantic Habitat and Ecosystem Internet Map Server</i></p> <p>This IMS contains several habitat and fishery databases for query in the South Atlantic.</p>	<p>http://www.oceansatlas.org/item-details/en/c/323756/</p>

<p><i>NMFS Highly Migratory Species Research Database</i></p> <p>This is a downloadable database of information related to tunas, sharks, and billfish in the Atlantic</p>	<p>https://www.fisheries.noaa.gov/topic/atlantic-highly-migratory-species</p>
<p><i>MarineCadastre.gov</i></p> <p>This mapping tool provides jurisdictional and regulatory data as well as seafloor habitat/geology, ESA critical habitat areas, and marine mammal density output models.</p>	<p>https://marinecadastre.gov/</p>
<p><i>NMFS Fishery Observer Manual</i></p> <p>This manual for observers aboard commercial fishing vessels is a good source for general fishery observations including data recording sheets</p>	<p>https://www.fisheries.noaa.gov/resource/document/northeast-fisheries-observer-program-handbooks</p>