



# **SOUTH FORK** WIND FARM

**Document Title:** Demersal Fisheries Resources Survey Protocol - **DRAFT**

**Issued for Comment:** November 14, 2018

**Comments Due:** December 14, 2018

**Submit comments via email to:** Melanie Gearon at [mgearon@dwwind.com](mailto:mgearon@dwwind.com)

## 1.0 Introduction

The South Fork Wind Farm (SFWF) is proposed in the Bureau of Ocean Energy Management (BOEM) Lease Area OCS A-0486 (Figure 1). Permit review for the SFWF is underway with offshore construction scheduled to begin in Spring 2021. Over the last three years, the SFWF team has spoken extensively with regional fishing organizations, working groups, and individual fisherman about their work in the project area as development of the wind farm has evolved. In addition, the SFWF team has consulted with several states (e.g., NY, CT, RI, and MA) and federal fisheries resource management agencies.

Based on feedback and data received to date, an approach to assess commercially and recreationally targeted demersal fish at the SFWF is needed. DWSF contracted INSPIRE Environmental, LLC. to draft this protocol for a Demersal Fisheries Resource Survey (Survey), which will provide data on:

- 1) Demersal species (susceptible to gillnets) that occur in and around the SFWF;
- 2) The seasonal timing of the occurrence of these species; and
- 3) Whether the taxonomic compositions of demersal fish assemblages change between the baseline and post-construction time periods, i.e., do some species have reduced abundance and/or new species appear?

This draft Survey protocol has been prepared for review by fishermen and state and federal resource management agencies. Comments on this draft Survey protocol must be submitted via email by December 14, 2018 to:

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All comments will be considered. A final protocol will be published in a Request for Proposals (RFP) in the Winter of 2019 with the goal of starting the Survey in the Spring of 2019. Similar to the principles and practices for the Block Island Wind Farm, SFWF is committed to conducting scientific surveys and assessments that are collaborative with the fishing industry. SFWF will select for-hire gillnet fishing vessels from which the Survey will be conducted.

The SFWF “Project Area” is defined as the maximum work area required to install the SFWF (yellow outline in Figure 1 below). This includes the maximum extent where vessels or lift barges may anchor during construction around the wind turbines and foundations.

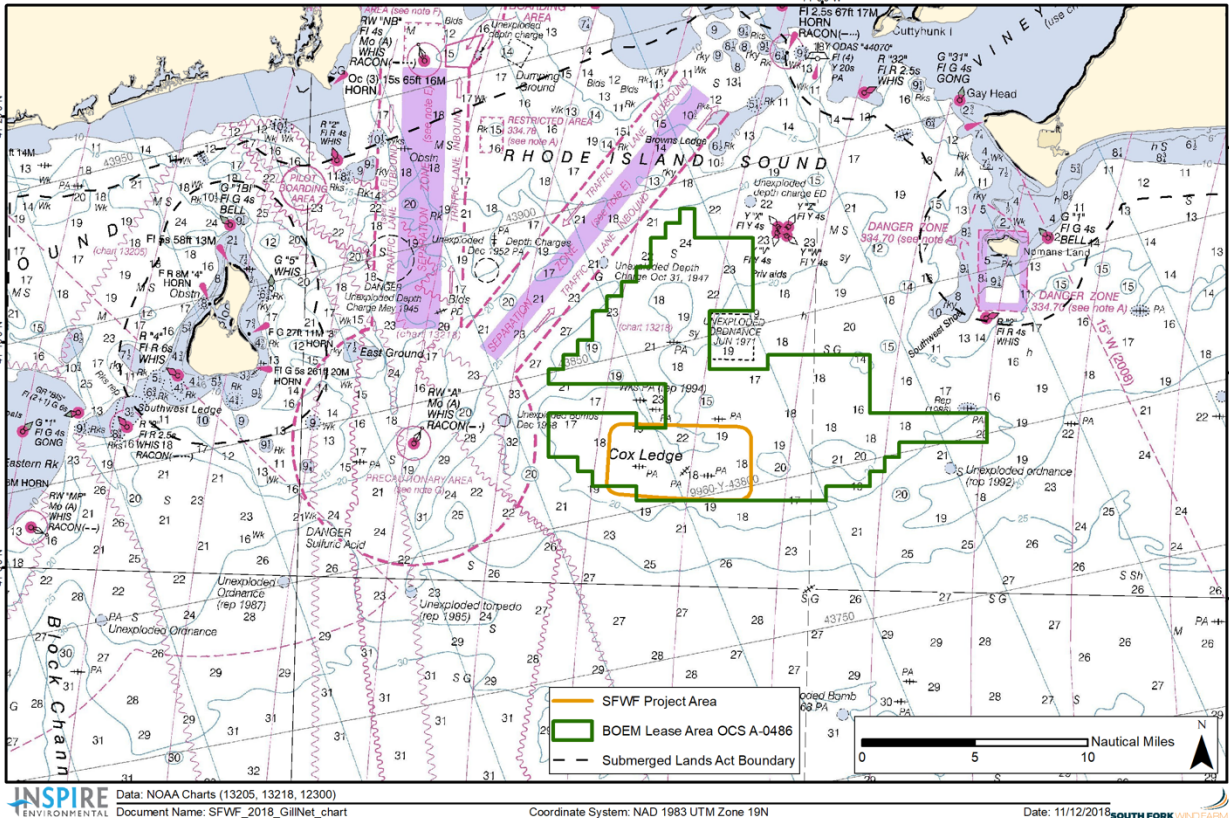


Figure 1. South Fork Wind Farm Project Area

## 2.0 Demersal Fisheries Resources Survey

The Survey will help establish pre-construction baseline community composition and may be used to assess whether detectable shifts occur in fish presence, absence, or abundance during and after construction.

### 2.1 Rationale

Federal Vessel Trip Report (VTR) data indicate bottom trawling and sink gillnets have the highest revenue and landings over all gear types fished within the Rhode Island-Massachusetts Wind Energy Area (RI-MA WEA). However, as indicated by fishermen, and further supported by Vessel Monitoring System (VMS) data, the SFWF Project Area within the larger RI-MA WEA, has minimal trawl effort. Gillnet high fliers have been observed in and around the proposed SFWF Project Area and participants in fisheries outreach meetings have indicated they actively gillnet in the Project Area. Details of the SFWF

fisheries data assessment and stakeholder feedback can be found in the SFWF COP Appendix Y - *Commercial and Recreational Fisheries Technical Report*<sup>1</sup>.

Southern New England waters are host to a large monkfish fishery, much of it permitted under gillnet licenses. Commercial fishermen who hold federal monkfish permits may also hold northeast multispecies, small mesh multi-species, spiny dogfish, and/or skate permits to optimize potential revenue and reduce bycatch return. As a result, a wide variety of demersal species are commercially fished using gillnets in the SFWF Project Area. Therefore, gillnets are proposed as the method of sampling for the Survey.

Gillnet selectivity depends mainly on fish size and shape and mesh size, but is also affected by the thickness, material, and color of net twine, hanging of net, and method of fishing (Hamley 1975). Using specific gear placements and prescribed mesh sizes, gillnets may be designed to target specific species, or subgroupings of species, and life stages.

Sampling demersal species with bottom otter trawls, similar to those used by NEAMAP<sup>2</sup> and at the Block Island Wind Farm, is less feasible within the SFWF Project Area due to the presence of boulders and mobile gear “hangs”. Additionally, gillnets are static, or a fixed gear type, and exhibit low impact to benthic habitats (Thomsen et al., 2010).

## 2.2 Survey Design/Procedures

The Survey will be conducted from commercial fishing vessel(s) with scientists on board to process the catch. As summarized in Section 1.0, SFWF will run a procurement process for the selection of for-hire fishing vessels. Vessels will be selected based on criteria such as experience, safety record, knowledge of the area, and cost. Vessels will be required to have one or more federal gillnet permits for the monkfish, northeast multispecies, small mesh multi-species, spiny dogfish, and/or skate fishery management plans (FMP). The vessel’s federal fishing permits will include incidental take under the Marine Mammal Protection Act (MMPA). Efforts will be taken to reduce marine mammal injuries and mortality caused by incidental interactions with fishing gear. Specific guidelines and plans (e.g., Harbor Porpoise Take Reduction Plan) will be implemented to reduce the potential for interaction or injury.

### 2.2.1 Proposed Sampling Stations

Three Survey blocks will be designated for sampling, two Survey blocks within the SFWF Project Area and one block within a reference area. Each Survey block contains three-predetermined gillnet areas delineated by bottom type: rocks and boulder, gravel, and sand/fines. One gillnet line per habitat type per block is randomly selected from the Survey areas for each Survey, resulting in nine independent gillnets conducted per Survey. Designation of Survey areas will be based on detailed geophysical seafloor Survey data as well as input from commercial gillnet fishermen regarding areas important to their work. Location of gillnets may be subject to change due to seasonal location of other fixed fishing

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<sup>1</sup> The SFWF Construction and Operations Plan (COP) and Appendices can be accessed online at: <https://www.boem.gov/South-Fork/>

<sup>2</sup> NorthEast Area Monitoring and Assessment Program (NEAMAP)

gear (e.g., lobster pots). If a Survey line is found to have poor conditions for setting gillnets it may be moved based on the captain's professional judgement.

Data will be collected in the Project Area (near field) and a farfield reference area with similar habitat characteristics as the SFWF. The reference area will serve as a general index of demersal fish abundance in Rhode Island Sound in an area well outside of the direct influence of the SFWF. Sampling in a reference area is necessary because differences in demersal fish abundance data from this Survey before and after construction might be due to regional trends rather than impacts due to construction. The study will be a before-after control-impact (BACI) experimental design for direct effects, with quantitative comparisons made before and after construction and between control and impact areas (Underwood, 1994). A BACI design will allow for assessment of detectable shifts in fish presence, absence, or abundance associated with construction and proposed operations.

The systematic sample design consists of sampling each of the treatment blocks (Survey block x habitat type) with a gillnet. SFWF is requesting feedback on this draft Survey plan, including the identification of suitable locations in the Project Area and the farfield reference area. The proposed sampling locations will be selected to ensure both a robust statistical sampling approach, e.g., matching habitat and depth conditions among the sampling blocks, and to enhance operational execution of the Survey and minimize space conflicts with other active uses.

### 2.2.2 Gillnet Methods

A gillnet is a wall of netting that hangs in the water column, it is typically made of monofilament or multifilament nylon. Mesh sizes are designed to allow fish to get only their head through the netting, but not their body. The fish's gills then get caught in the mesh as the fish tries to back out of the net. Factors that can influence the catch rate of gillnets for target species include: fish density in the vicinity of gears, the behavior of the target species, the ability of fish to detect and locate the gillnet, and environmental factors such as water temperature, visibility, current direction, and velocity. It is often challenging to calculate catch per unit effort (CPUE) from gillnets due to potential changes in efficiency (e.g., fluctuating soak time and catch rate). This Survey is designed to account for as many variables as possible to standardize CPUE. Comparison of this gillnet Survey data to other baseline sampling efforts (e.g., nearby federal NEAMAP trawl stations) will be limited due to gear and effort differences.

The gillnet Survey may be conducted using two types of gillnets including experimental gillnets with multiple mesh sizes (e.g., four panels of 5", 6", 6.5" and 7" mesh) and typical, single mesh size gillnets commonly used in Rhode Island and Massachusetts fisheries (including the Southern New England Monkfish and Dogfish Gillnet Exemption Area) as determined through consultation with contracted fishermen.

Sampling will take place a minimum of once per season, year-round for a minimum of one year prior to the start of construction and for up to two years post construction. During the year of construction, sampling will track with the period of actual construction activities. The standard soak time of approximately 16 hours, is proposed to be consistent with recent scientific surveys (Kelly 2006, Grizzle et al., 2009), coupled with input from gillnet fisherman, to maximize catch and standardize catch rates. Soak time will remain consistent throughout the duration of the Survey. Each Survey event will be managed by a team of qualified scientists including a lead scientist with experience performing fisheries

research. The catch will be removed from the gillnets by the boat crew for processing. The lead scientist will be responsible for collection of data and data recording.

Fish collected in each gillnet will be identified, weighed, and enumerated consistent with the sampling approach of Northeast Area Monitoring and Assessment Program (NEAMAP). Scientists will sort and identify fish, and weigh each species by the following protocol:

All organisms will be identified to species. Taxonomic guides include: NOAA Guide to Some Trawl Caught Marine Fishes (Flescher, 1980), Kells and Carpenter (2011) Field Guide to Coastal Fishes from Maine to Texas and Peterson's Field Guide to the Atlantic Seashore (Gosner, 1999).

The catch will be sorted by species. All specimens are sorted by species and size (if appropriate) into buckets or fish totes as needed. This process continues until all specimens are sorted, and the lead scientist verifies that the sorting areas are clear of all specimens.

Notwithstanding sub-sampling procedures, up to 50 individuals of each species/size are measured and the rest counted. Individual lengths are recorded on the field data sheet. Fork length is recorded for all fishes with a forked tail. Total length is measured for all other fishes. Exceptions to these rules are the measurement of skates and rays (disc width), and sharks (pre-caudal length). Total weight of all individuals of each respective species will be recorded.

### 2.2.3 Atlantic Cod Reproductive Stage

Atlantic cod is historically an important cultural and commercial species in New England and is believed to be dependent on geographically-specific spawning areas. Atlantic cod length, weight, location caught, and spawning condition will be recorded for all individuals caught. All Atlantic cod caught will be examined externally for signs indicating they are in the ripe and running maturity stage (Table 1). When caught individuals are not in the ripe and running maturation stage they will be dissected to determine maturation stage (Hutchings et al., 1999, Siceloff and Howell 2013, Dean et al., 2014). The maturity stage of each individual dissected will be assigned based on guidelines determined by Burnett et al. (1989) and updated by O'Brien et al. (1993): immature, developing, ripe, ripe and running, spent, resting, unknown (Table 1). Weight (g) of dissected gonads will be recorded. Photographs of gonads will be recorded for all individuals dissected for QA/QC analysis.



Table 1. Maturity staging criteria used during the Northeast Fisheries Science Center trawl surveys and to be utilized in determining Atlantic cod maturity (from O'Brien et al., 1993)

Stage	Description and Criteria
<b>Female</b>	
Immature	Ovary paired, tube-like, small relative to body cavity; colorless to pink jell-like tissue, no visible eggs; thin transparent outer membrane.
Developing	Ovaries large, occupying up to 2/3 of the body cavity; blood vessels prominent when present; ovary appears granular as yellow to orange yolked eggs develop. A mix of yolked and hydrated eggs.
Ripe	Ovaries large, may fill entire body cavity; hydrated eggs present. Transparent ovary wall.
Ripe and Running	Eggs flow from vent with little or no pressure to abdomen.
Spent	Ovaries flaccid, sac-like similar in size to ripe ovaries; color red to purple; ovary wall thickened, cloudy and translucent; some hydrated eggs may adhere to ovary wall.
Resting	Ovaries smaller than ripe ovaries, but larger than immature. Interior jell-like, no visible eggs.
<b>Male</b>	
Immature	Testes small relative to body cavity, colorless to gray and translucent. Testes narrow, lobed and elongated, resembles crimped ribbon.
Developing	Testes large, grey to off-white, firm consistency with very little or no milt present.
Ripe	Testes larger than 'Developing', chalk white, consistency mostly liquid. Milt flows easily when testes dissected.
Ripe and Running	Chalk white milt flows easily from the vent with little or no pressure on abdomen. Once dissected, milt flows easily.
Spent	Testes flaccid, may contain residual milt, less robust than 'Ripe'. Edges or other parts of testes starting to turn reddish to brown or grey as milt recedes.
Resting	Testes shrunken in size relative to 'Ripe'. Color is yellow, brown or grey with little or no milt.

#### 2.2.4 Hydrographic and Atmospheric Data

Hydrographic data will be collected using a YSI 6820 V2 multi parameter sonde coupled with a YSI 650 MDS display system (or similar). The sonde is lowered overboard and held in surface waters until the instrument equilibrates. Water temperature (degrees C), dissolved oxygen concentration (mg/l), and

salinity (ppt) data are recorded for the near-surface waters. The sonde is then lowered to near-bottom and water temperature, dissolved oxygen, and salinity data are recorded. Measurements are recorded for each station at the end of each tow.

Sea state and weather conditions are recorded from visual observations. Air temperature may be downloaded from a local weather station if not available onboard.

### 2.2.5 Gillnet Station Data

The following data will be collected during each sampling effort:

- Station number
- Latitude and longitude
- Soak start and end time and date
- Water depth
- Wind speed
- Wind direction
- Wave height
- Air temperature
- Surface and bottom water temperature, salinity, and dissolved oxygen

### 2.2.6 Data Entry and Reporting

Data will be transcribed from hard copy datasheets into electronic worksheets. The data sheets will be reviewed for data entry errors prior to importing into a relational database. Quality control checks will be performed on database tables by running standardized, systematic queries to identify anomalous data values and input errors. Species names (common and scientific) are verified and tabulated for consistency. All data used in analysis will be exported from the relational database.

Annual reports containing catch data will be prepared after the conclusion of each year of sampling and shared with State and Federal resource agencies. One final report will also be produced synthesizing the findings of the pre- and post-construction evaluations.

## 2.3 Potential Demersal Species Catch

It is anticipated that species primarily targeted in the monkfish, northeast multispecies, small mesh multi-species, spiny dogfish, and skate FMPs will account for a majority of the catch (Table 2). Table 2 is not all inclusive, additional fish and invertebrates will be caught in Survey gillnets.

Table 2. Example species likely to be collected in gillnet Survey.

<b>Resource</b>	<b>FMP/Permit</b>
Monkfish	Monkfish
Atlantic cod	Northeast Multispecies
Haddock	Northeast Multispecies
Atlantic pollock	Northeast Multispecies
Witch Flounder	Northeast Multispecies
Yellowtail Flounder	Northeast Multispecies
American Plaice	Northeast Multispecies
Winter flounder	Northeast Multispecies
Atlantic halibut	Northeast Multispecies
Redfish	Northeast Multispecies
White hake	Northeast Multispecies
Silver hake	Small-Mesh Multispecies
Red hake	Small-Mesh Multispecies
Offshore hake	Small-Mesh Multispecies
Spiny dogfish	Spiny Dogfish
Winter skate	Skate
Barndoor skate	Skate
Thorny skate	Skate
Smooth skate	Skate
Little skate	Skate
Clearnose skate	Skate
Rosette skate	Skate
Conger eel	NA
Black sea bass	NA
Tautog	NA
Cunner	NA
American lobster	NA



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