Year 1 Interim Report
SFW01-0097 Fisheries Monitoring Plan
WP1: Gillnet Monitoring Plan

Reporting Period: 1 Oct 2021 to 31 March 2022

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Executive Summary

The Commercial Fisheries Research Foundation (CFRF) and fishing partners have completed the first year of the South Fork Wind Farm pre-development fisheries monitoring gillnet survey. During the reporting period, all survey trips for the fall seasonal survey were completed between October and December 2021. The gillnet survey gear consists of five gillnet strings per area with six, 300-foot net panels of 12-inch mesh and tie downs. A total of ninety nets were sampled, twice per month on a 24-hour soak during survey periods. The entire catch was measured, and weighed, with length/width measurements taken of individual fish and crustacean species. Stomach samples were collected from select commercially valuable fish species such as winter skate, monkfish and Atlantic cod for prey composition analysis. Oceanographic conditions including temperature, depth, salinity, and weather conditions were recorded for each string. Preliminary results reported cover the entire first year of surveying. The eastern reference area encountered 20 different species and was dominated by skates (winter and little skate), monkfish, and bluefish. The western reference area encountered 27 different species and was dominated by skates (winter skate, little skate), sea scallops, monkfish, and bluefish. Finally, the proposed wind farm area encountered 23 different species and was dominated by winter skate, monkfish, little skate, and bluefish. During the spring months, winter skate dominated the catch with consistent lower levels of summer flounder, monkfish, and little skate catch. In the fall, an increase in monkfish catch, little skate and bluefish was observed.

Introduction

The Commercial Fisheries Research Foundation in partnership with local fishermen are conducting pre-construction fisheries monitoring surveys of the South Fork Wind Farm (SFWF) near Cox Ledge. Due to the differences in selectivity of different gear types, four different surveys, each using a different gear type, are currently conducted: beam trawl survey, gillnet survey, ventless trap survey, and fish pot survey. One of the primary methods for assessing anthropogenic impacts on natural habitats is the Before-After-Control-Impact design. The ideal design for this experiment requires baseline information before impact in multiple control areas from several points in time. This asymmetrical design is needed not only to evaluate the variation in animals and habitat within impact areas before and after development, but also to ensure changes in variation can be attributed to the anthropogenic impact. The gillnet survey uses this design, with a focus on monkfish and winter skate, to assess whether detectable shifts occur in the presence, relative abundance, and demographics of these species before and after construction (Figure 1). The survey also collects data on the oceanic conditions associated with fish catch which may help to interpret results in the context of a changing environment and provide general information about animal ecology. The survey began in May 2021 with sampling occurring twice per month from May-June 2021, and then October-December 2021. This report details the methods of the survey and summaries the result from the first year of sampling.

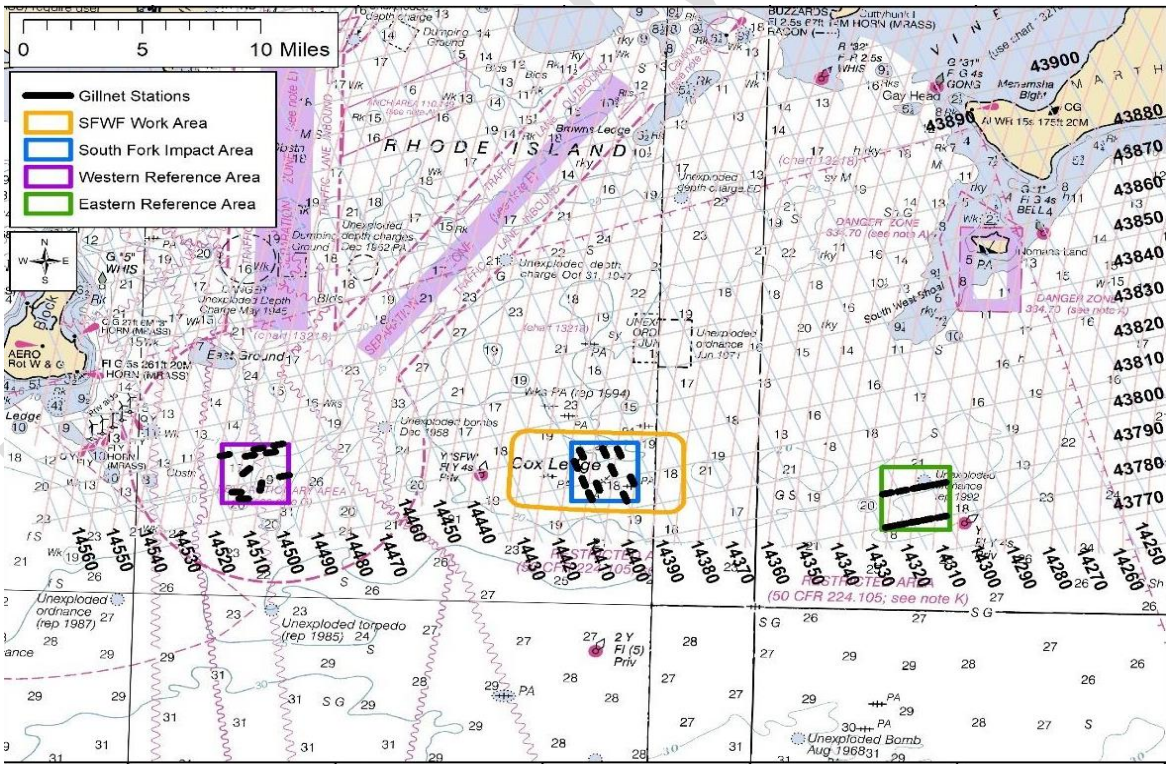

Figure 1. The South Fork Wind Farm (SFWF) gillnet survey area including the impact area and western and eastern reference areas.

Methods

Twice per month, 5 stations in an impact area and two reference areas are surveyed (Figure 1). Prior to each survey departure, the fixed stations in each area are randomly selected, resulting in 15 gillnet strings (stations) sampled per survey day. Each area has 10 fixed stations and five are randomly selected from each area per survey day. The fixed station locations were identified during the survey kick off meeting between CFRF staff, Orsted, Inspire Environmental, and fishing partners. In the western reference area the 10 selected stations also incorporated feedback from local scallopers and gillnetters external to the survey and are locations that would have the least impact with other gear type users, and still catch the migration of skates and monkfish. In the SFWF area, it was recommended to set north to south and selected 10 random stations that demonstrated a mix of shallow and deep water depths. In the eastern area gear was set along Loran Lines commonly utilized by gillnetters. Five equally distanced stations along each of these lines were chosen (Figure 1). Each gillnet station consisted of six, 300-ft net panels of 12-inch mesh with a hanging ratio of ½ (50%) and 42-inch net tie-downs. This is the typical setup of the commercial fishery in Rhode Island and Massachusetts. The original target soak time was 48 hours for sampling dates in May and June (with the exception of 6/30 trip which was reduced to 24 hours). A reduction in gear soak time from 48 hours to 24 hours was a change from the spring to fall survey season in an effort to reduce interactions with protected species. This change went into effect on June 30th, 2021

On gear set days, the captain recorded the local time the gear was set, and secured a HOBO TidbiT UTBI-001 logger randomly to one of the 5 strings per area to record data at 10-minute intervals during the soak time. During haul sampling days, the following station and environmental data were recorded: station number, location (latitude and longitude), haul begin and end time, soak time and date, water depth (ft) at start and end of string haul, wind speed and direction and Beaufort Sea state. A handheld Global Positioning System was used to collect station information. A conductivity, temperature, and depth (CTD) cast was done at the end of each string to record the vertical temperature, depth, and salinity profile of the station. The gear condition (torn meshes, or if any nets were obstructed by a large object, torn, or balled up) was also recorded for fishing effort.

Once fish were brought onboard, the first 30 fish of each species are measured to the nearest cm and weighed to the nearest 0.01 kg. The sex of all skate species was also recorded. Once 30 individuals of each species were measured and weighed per string, the additional fish were weighed in baskets (recording count of individuals per basket and weight (kg) of each basket) until 30 baskets had been weighed. Scientists utilized tally count for the remaining count of a particular species. If a species was decomposed, or missing portions of its body/skeleton, scientists dashed weight and recorded length only with a subsequent comment as to the reason. Up to 10 individuals per string were sacrificed for stomach sampling from each station. Typically, this meant 5 monkfish and 5 winter skate per string to have an even

distribution. However, any Atlantic cod, were also retained for stomach analysis. The individuals were measured and weighed and then the stomachs excised and stored on ice for further analysis at the lab. The reproductive stage and sex were recorded for all codfish, skate and monkfish during the stomach sampling.

All invertebrates were processed according to species. Sea scallops were measured and weighed. All rock crabs, Jonah crabs and lobsters were measured for carapace width/length to the nearest 0.1 mm, weighed and then evaluated for shell condition, number of claws, disease status, sex, egg status, and the presence of v-notches for lobster. The remaining invertebrates are identified to species level and then counted and weighed by species. Any incidental takes were immediately processed (length, photo, tag check) and gently returned overboard and observed for post capture condition. Depending on the protected species interaction, a detailed written report was provided to GARFO within 24 hours and emailed to incidental.take@noaa.gov that included gear set information, haul information, water depth, temperature and where in the gillnet panel the interaction occurred (Appendix 1).

The stomachs selected for further analysis were frozen upon returning to land then processed within two weeks of collection. The entire stomach was weighed prior to dissection, then each prey item identified to the lowest possible taxonomic unit with the aid of a 5x magnifier or a 25x stereo microscope. Intact prey items were measured for total length (carapace width for crabs) and the individual weight recorded to the nearest 0.01 g. Prey items that could not be measured were aggregated by species for the weight and if possible, the number of individuals recorded. If prey items could not be identified to the species level, they were grouped to the lowest possible level and weighed. After the stomach was fully examined an empty stomach weight was recorded.

All data were imported into an Access survey database and linked to each station sampled. Upon completion of data entry, all data is reviewed for accuracy by at least one of the scientists who sampled the data. Data is then submitted to INSPIRE Environmental.

Preliminary Results:

The data in this report covers the 10 sampling trips during the first year of the gillnet survey. Each trip was conducted as close to every other week in the month as possible (Table 1). All data for these trips has been entered into the project database, reviewed for accuracy, and shared with INSPIRE Environmental. The CTD cast was successful for all hauls, and the average temperature (°C) and salinity (PSU) were consistent between survey areas (Table 1). Summary information of the species composition and size distribution of monkfish/winter skate for the first year is displayed in Table 2 and Figures 2-4. The eastern referenced area was dominated by several skate species (winter and little), monkfish, bluefish, summer flounder and spiny dogfish. The western reference area was also dominated by several skate species like the eastern area, monkfish, bluefish, Atlantic menhaden, and sea scallops. The SFWF development

area had 23 different species observed and had the highest number of winter skate, little skates, and monkfish. In addition, the SFWF development area also saw bluefish, spiny dogfish and summer flounder. In total, 12,264 winter skates, 1,138 monkfish, 1,183 little skate, 645 bluefish, and 125 summer flounder were measured and exemplify the top species caught during year 1. A total of 909 stomachs were processed for stomach content analysis in year 1. Most of the prey items were digested fish, little/winter skate, and menhaden. In addition, about 41% of the stomachs were empty (Figure 5).

During the spring months, winter skate dominated the catch with consistent lower levels of summer flounder, monkfish, and little skate catch. In the fall, an increase in monkfish catch, little skate and bluefish was observed. (Figure 2). To understand the catch composition of winter skate during year 1, winter skate size and sex distribution were compared (Figure 3). During the spring, male winter skates ranged from 46 to 103 centimeters with an average length of 82 cm while the females ranged from 48 to 97 centimeters, with an average length of 77 cm. In the fall, male winter skates ranged from 36 to 105 centimeters with an average length of 81 cm, compared to a range of 48-96 cm with an average of 74 cm for females. In both seasons, more males were caught than females. The size distribution of monkfish between the spring and fall survey seasons was also explored (Figure 3). In the spring, monkfish ranged from 36 to 94 centimeters with an average length of 68 cm. Similarly, in the fall monkfish ranged from 43-97centimeters with an average of 71 cm.

During year 1 of the gillnet survey, the gear interacted with species of concern and were reported appropriately to Greater Atlantic Regional Fisheries Office within 24 hours, as well as Bureau of Ocean Energy Management (Appendix 1). It is unclear how this change impacts the comparison of spring and fall year 1 data.

Table 1. Trip dates and average bottom temperature and salinity for each survey in the South Fork Wind Farm development (SFWF) area and two nearby reference areas (east and west).

	Average Temperature (°C)			Average Salinity (PSU)		
Survey Date	East	SFWF	West	East	SFWF	West
5/20/2021	7.0	7.1	6.6	32.5	32.5	32.8
6/3/2021	9.6	10.1	10.0	32.7	32.5	32.5
6/15/2021	10.4	10.1	9.8	32.6	32.7	32.6
6/30/2021*	11.4	11.1	9.6	32.6	32.6	32.9
10/13/2021	19.0	17.9	18.0	33.8	33.3	33.2
11/02/2021	16.0	16.3	17.0	32.8	33.2	33.2
11/10/2021	15.1	15.3	15.7	32.8	32.6	33.1
11/17/2021	14.5	14.8	15.2	32.7	33.0	33.0
12/01/2021	12.3	12.6	15.2	33.0	32.9	34.1
12/15/2021	11.4	11.8	12.2	33.1	33.1	33.2

Table 2. Total number of each species caught for the South Fork Wind Farm development (SFWF) area and two nearby reference areas (east and west) sampled during the first year of the gillnet survey (May-June 2021, October-December 2021).

Species	East	SFWF	West
AMERICAN LOBSTER		5	2
ATLANTIC BLUEFIN TUNA	1	1	7
ATLANTIC COD	1	10	17
ATLANTIC MENHADEN	4	12	121
ATLANTIC STURGEON		1	5
ATLANTIC WHITE SHARK	1		
BARNDOOR SKATE	30	46	34
BLACK SEA BASS	1	2	1
BLUEFISH	162	270	213
BLUE SHARK	1		
CHUB MACKEREL			10
CLEARNOSE SKATE	1	7	4
COWNOSE RAY			1
DUSKY SHARK	2		
GRAY SEAL	5		
HARBOR SEAL		1	
HORSESHOE CRAB	1		1
JONAH CRAB	12	96	38
LITTLE SKATE	536	441	206
MAKO SHARK		1	
MONKFISH	297	520	321
MOON SNAIL	1	1	
NORTHERN SEAROBIN	5		
OCEAN QUAHOG (CLAPPER)			2
ROCK CRAB	36	21	5
SAND TIGER SHARK			1
SANDBAR SHARK	26	12	1
SCUP			1
SEA SCALLOP	7	1	499
SKATE EGGS		1	
SMOOTH DOGFISH	2	11	48
SPINY DOGFISH	49	93	15
STRIPED BASS			3
SUMMER FLOUNDER	53	47	25
SWIMMING CRAB UNCL.			2
TAUTOG		1	1
THRESHER SHARK	1		
TIGER SHARK	1		
TORPEDO RAY	1	1	1

WEAKFISH		2	18
WINTER SKATE	2821	4992	4451
YELLOWTAIL FLOUNDER		1	

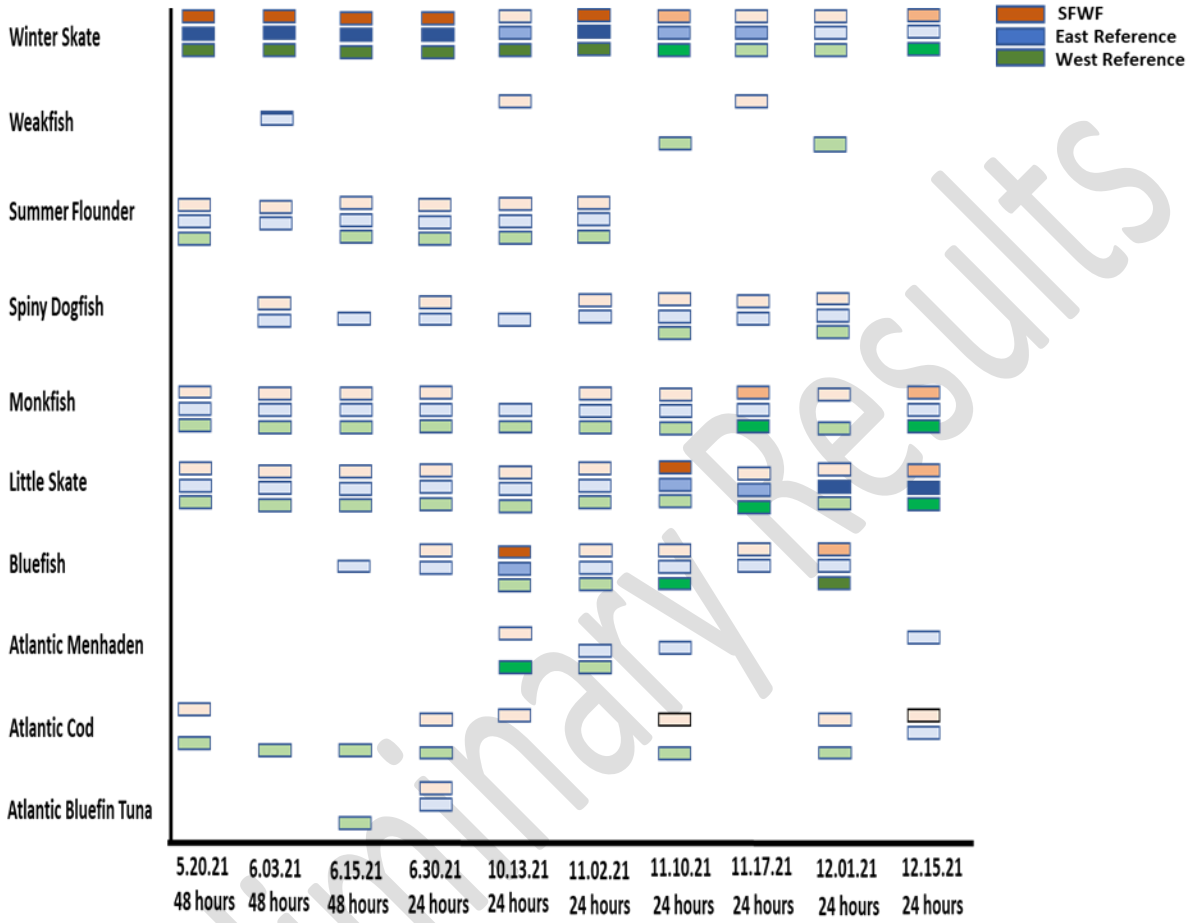

Figure 2. Predominant finfish species in catch per survey date for the South Fork Wind Farm development (SFWF) area and two nearby reference areas (east and west). The intensity of the bar color represents the percent of catch: dark => 50%, medium =25-49%, light <25%.

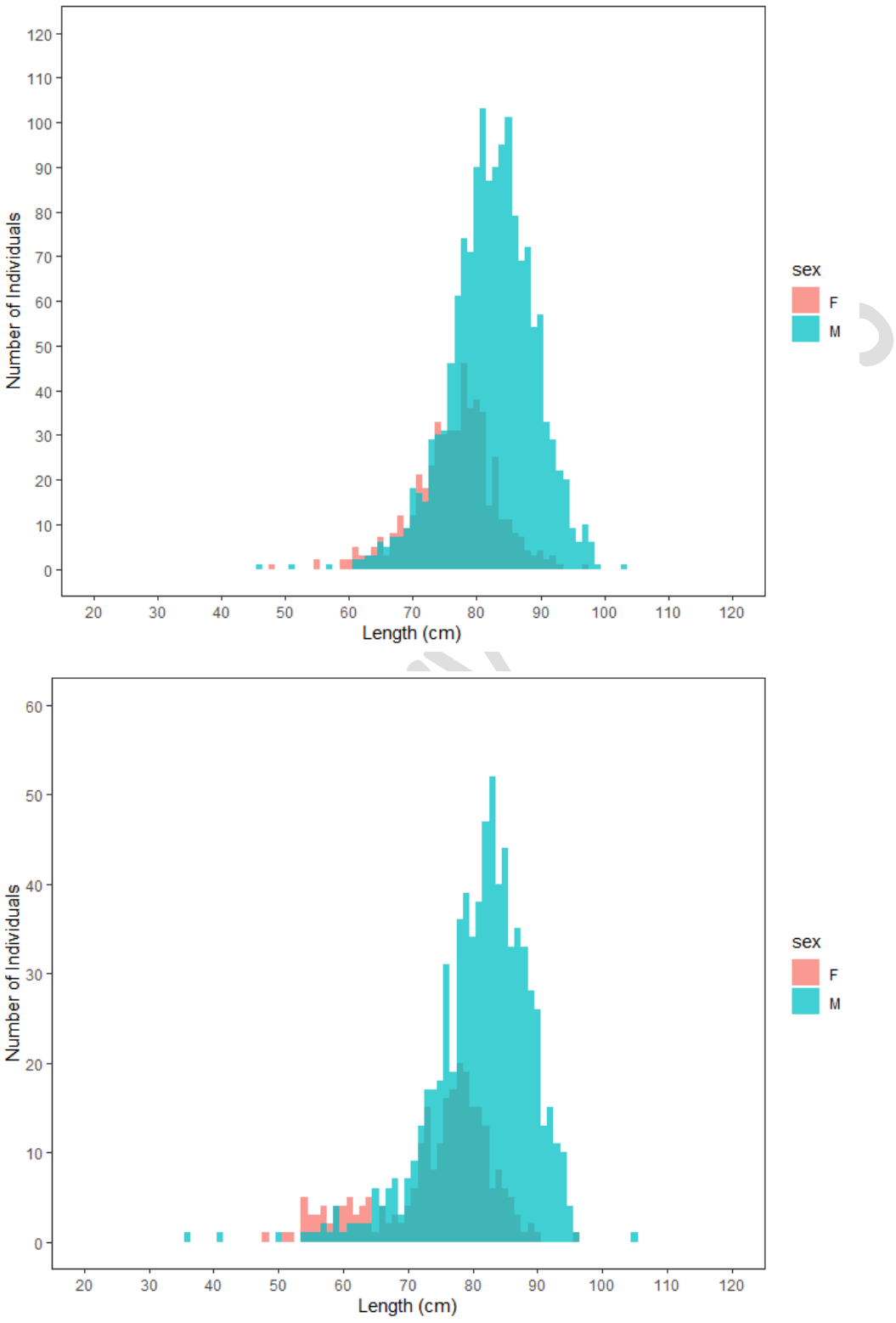

Figure 3. Winter skate size and sex distributions from the spring (top) and fall (bottom) for the South Fork Wind Farm development area and two nearby reference areas combined.

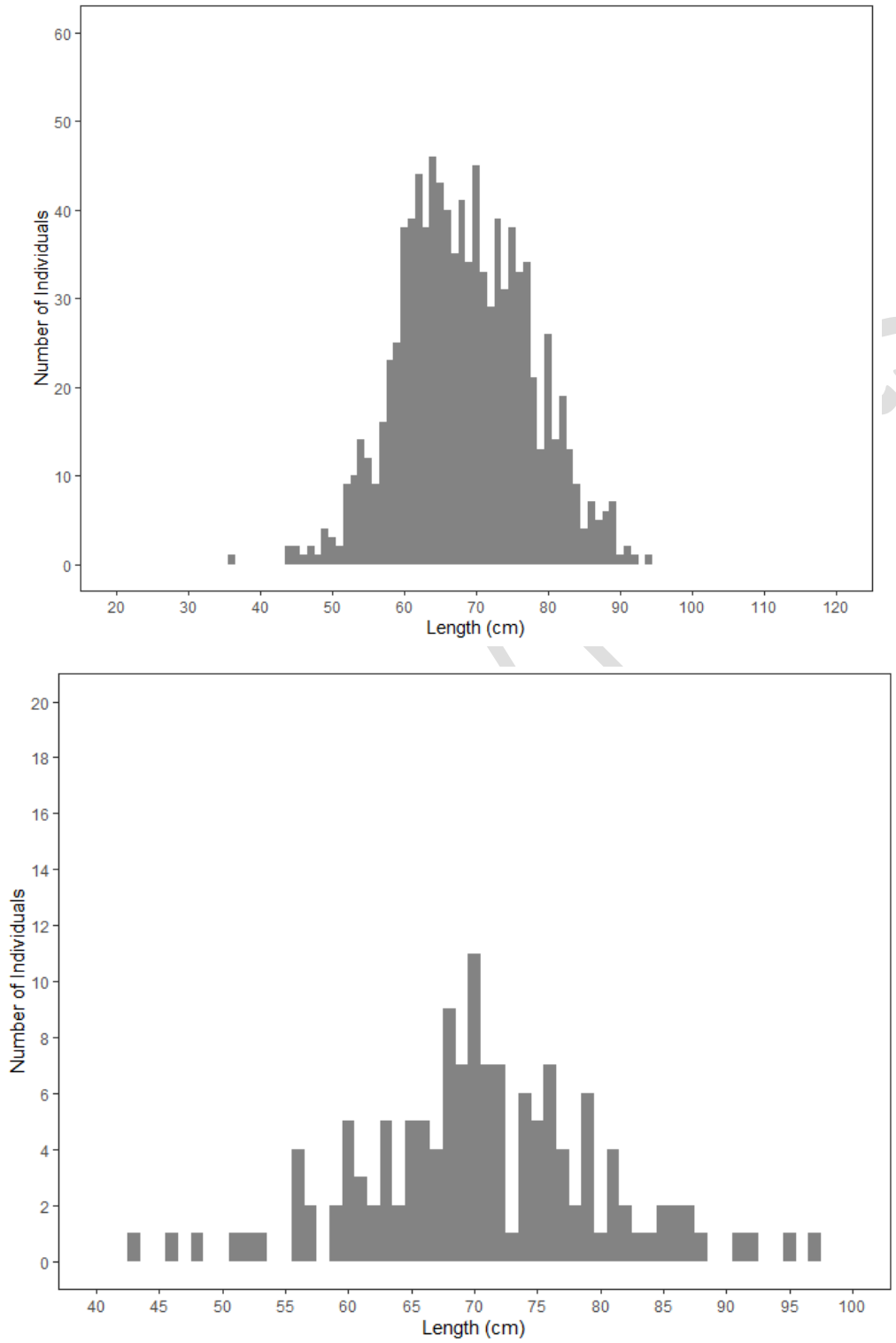

Figure 4. Monkfish size distribution from the spring (top) and fall (bottom) for the South Fork Wind Farm development area and two nearby reference areas combined.

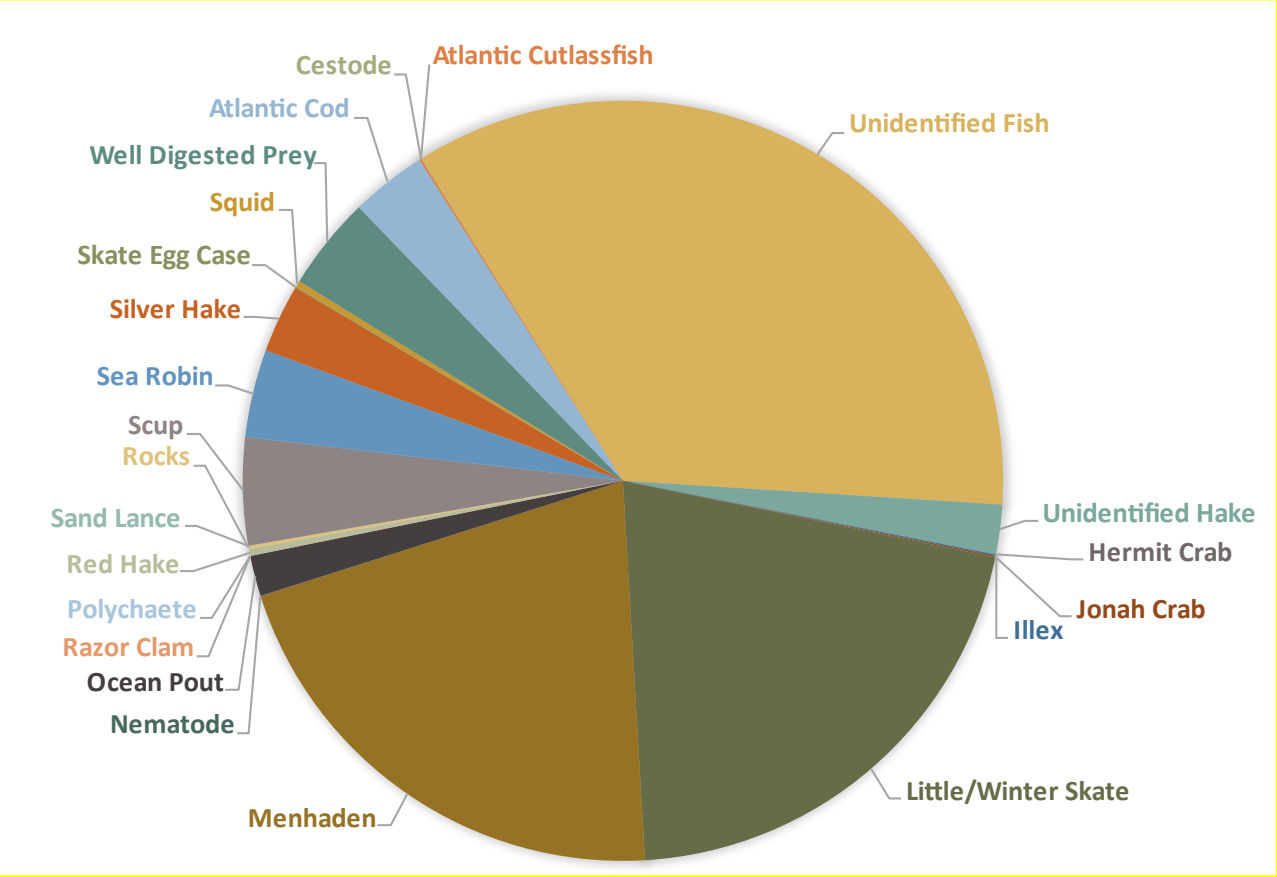

Figure 5. Composition of stomach contents of monkfish from all seasons and the South Fork Wind Farm development area and two nearby reference areas combined.

Outreach:

The CFRF maintains a project website at http://www.cfrfoundation.org/sfwf-gillnet-survey where data summaries are uploaded as the survey progresses. This survey has also been highlighted in the CFRF quarterly newsletter (July 2021 and March 2022). A public outreach event regarding year 1 of the South Fork Wind Farm pre-development surveys was held at Champlin's Seafood Deck in Point Judith, Rhode Island from 1-4 pm on March 28, 2022. At the event posters presented survey and gut content results and a presentation was given to a live and virtual audience. In total, approximately 40 people attended the event.