

Project Title: Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach

Award Number: NA20NMF4740181

Award Period: September 1, 2020 – August 31, 2025

Reporting Period: 03/01/2021 - 08/31/2022

Recipient Name: Rhode Island Department of Environmental Management (RI DEM); and sub-award recipient: The Commercial Fisheries Research Foundation (CFRF)

Principal Investigators: Jason McNamee, Deputy Director, RI DEM Bureau of Natural Resources; N. David Bethoney, Executive Director, CFRF; and, Thomas Heimann, Research Biologist, CFRF

This long-term project has been in operation since 2016. It was originally funded under a different award number (NOAA award number NA16NMF4740182), which supported data collection from September 1, 2016 through April 30, 2021. However, data collected from May 1, 2021 through present has been supported by NOAA Award Number NA16NMF4740181. All data from the current reporting period were collected under the current award. Data from previous reporting periods, included in this report for comparative purposes, were collected under both awards.

Tasks Scheduled for Reporting Period:

The major tasks scheduled for this reporting period include:

- **March:** Black Sea Bass Research Fleet data collection; Research Fleet database management; Research Fleet participant support; App performance monitoring
- **April:** Black Sea Bass Research Fleet data collection; Research Fleet database management; Fleet participant support; App performance monitoring; Development and distribution of quarterly data reports to Research fleet participants; Collaboration with the Black Sea Bass Research Track Stock Assessment Working Group
- **May:** Black Sea Bass Research Fleet data collection; Research Fleet database management; Fleet participant support; Collaboration with the Black Sea Bass Research Track Stock Assessment Working Group
- **June:** Black Sea Bass Research Fleet data collection; Research Fleet database management; App performance monitoring; Fleet participant support; Collaboration with the Black Sea Bass Research Track Stock Assessment Working Group
- **July:** Black Sea Bass Research Fleet data collection; Research Fleet database management; Fleet participant support; Development and distribution of quarterly data reports to Research fleet participants; First 2022 biannual data submission of Research Fleet collected data to The Atlantic Coastal Cooperative Statistics Program (ACCSP) biosamples database; Collaboration with the Black Sea Bass Research Track Stock Assessment Working Group
- **August:** Black Sea Bass Research Fleet data collection; Research Fleet database management; App performance monitoring; Fleet participant support; Collaboration with the Black Sea Bass Research Track Stock Assessment Working Group

The overall timeline for the project is as follows:

- **September 2016 – August 2025:** Research Fleet collects black sea bass data and whole fish samples, RI DEM and Virginia Institute of Marine Science (VIMS) analyze black sea bass samples for maturity, diet, and age. Sampling will continue as long as possible through this period. CFRF staff manage the project, audit and maintain the database, analyze data, and prepare project reports and presentations.
- **September - December 2025:** CFRF & RI DEM analyze data and prepare final report.

Tasks Accomplished in Reporting Period:

Maintenance of On Deck Data Tablet Application and MySQL Database

Two updated versions of On Deck Data were released during the reporting period. The first update included new functionality for the newly established Scallop Research Fleet; although it was not intended to affect the Black Sea Bass Research Fleet functionality, some Research Fleet members experienced errors when updating to this new version. As a result, the On Deck Data developer released a second update that fixed the associated bug, and project staff worked with Research Fleet members to update to the newest version. No data collection was affected by the two updates. Project staff regularly audited data for quality control/quality assurance as it was uploaded to the MySQL database.

Maintenance of Black Sea Bass Research Fleet and Communication with Participants

The major tasks during this reporting period included communication and support of Research Fleet participants, assistance with and documentation of at-sea sampling, gear replacement as needed, and data analysis.

A full list of active Research Fleet members is provided below. The captain of the F/V Laura Lynn retired from fishing this year and as a result has also retired from the Research Fleet. Despite this, the 14 currently active Research Fleet members are sampling at the projected rate, so there are no plans to add new vessels at this time. Instead, the focus will be on retaining and supporting the current participants to maintain the current sampling rate.

- Rick Bellavance, F/V Priority Too - Point Judith, RI
- Kenneth Murgo, F/V Johnny B - Portsmouth, RI
- Todd Sutton, F/V Sweet Misery & F/V More Misery - Newport, RI
- Harry Whilden, F/V Matrix & F/V Lucy Rose - Wickford, RI
- Troy Sawyer, F/V Debbie Sue – Point Judith, RI
- Gary Mataronas Sr., F/V X-Terminator – Sakonnet Point, RI
- Joe Baker, F/V Harvest Moon – Point Judith, RI
- Eric Lundvall, F/V Rayna and Kerstin – Newport, RI
- Peter Spong, F/V Brooke C – Point Judith, RI
- Al Eagles, F/V Catherine Ann – Newport, RI
- Joseph Wagner Jr., F/V Savannah Paige – Cape May, NJ
- Joseph Wagner Sr., F/V Saturn – Cape May, NJ
- Derek Pascale, F/V Ragged Edge – Point Judith, RI
- Bill Cote, F/V New Hope – Point Judith, RI

The CFRF prepared and distributed the first two rounds of 2022 quarterly reports in April and July 2022 on the same schedule as previously established. The quarterly reports contain all of the raw data collected by each individual Research Fleet member, as well as general summaries of data collected each quarter. All Research Fleet members are sent copies of their own individually collected data as they retain joint ownership of the data.

Otherwise, Research Fleet maintenance and support is an ongoing task and has continued as it has throughout the span of the project. There have been no changes in personnel since the previous reporting period. Throughout the current reporting period the CFRF was in close communication with Research Fleet members to assist with any issues. CFRF staff and project Co-PIs were always available to aid Fleet members as needed. Common tasks related to Fleet support include; invoicing assistance, data upload assistance, sampling equipment maintenance and replacement, and review of sampling protocols.

Collection and Analysis of Black Sea Bass Data

The Black Sea Bass Research Fleet was actively fishing and sampling throughout the reporting period. The total number of black sea bass sampled through this reporting period is 4,681 from a total of 187 sampling sessions throughout Southern New England the into the Mid-Atlantic (Figure 1). This number is similar to sample sizes from the same reporting period in previous years; for example, 4,778 black sea bass were sampled during this reporting period a year prior. With the addition of the black sea bass recorded in the current reporting period, a total of 46,221 black sea bass have been sampled from 2,493 separate sampling sessions between December 1, 2016 and August 31, 2022 (Figure 2).

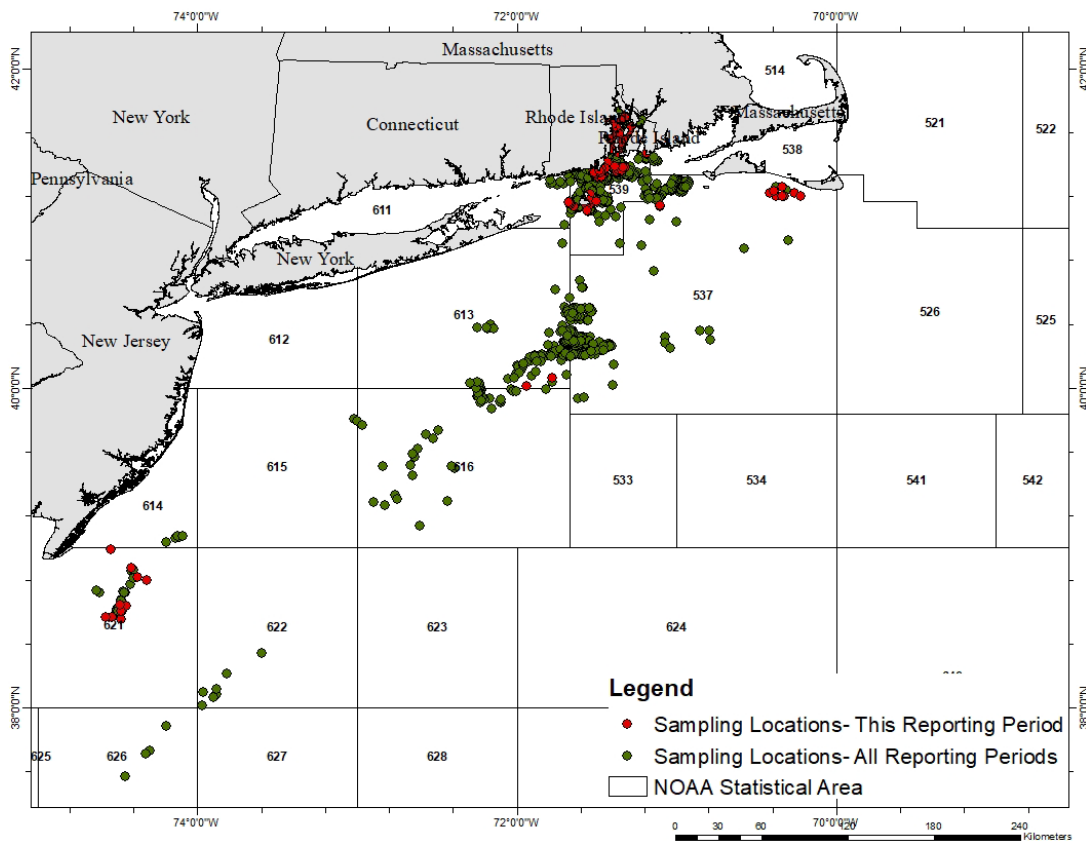


Figure 1. Sampling locations of black sea bass collected during this (red) and previous (green) reporting periods.

During the current reporting period, the Research Fleet averaged 25 black sea bass sampled per session. This reporting period each year typically has the lowest number of black sea bass recorded per session as it encompasses the time of year when black sea bass are migrating inshore (March – June). As seen in Figure 2, the Research Fleet sampled through the reporting period at a similar rate to previous years in the March to August range. Typically, sampling during the first few months of this reporting period window is slow, as many participant vessels either are not fishing during this timeframe or are not heavily interacting with black sea bass as a target species or bycatch. Similar to this year, sampling then increases during the late spring/early summer when more vessels are active and black sea bass have returned inshore after their offshore winter migration.

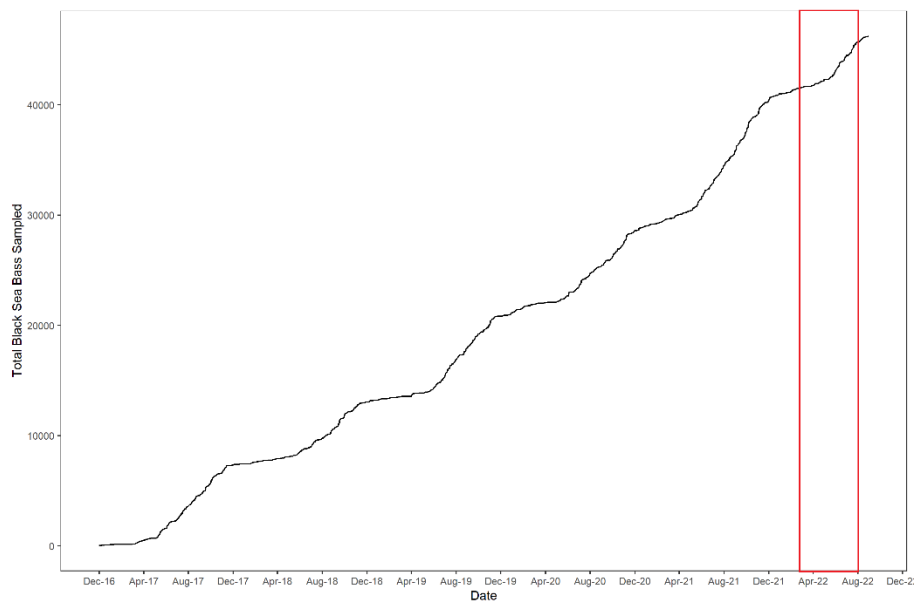


Figure 2. Time series of black sea bass sample sizes by the Black Sea Bass Research Fleet from December 1, 2016 to August 31, 2022. The current reporting period is marked with a red box.

Of the 4,681 black sea bass sampled by the Research Fleet during this reporting period, approximately 30% were male, 25% were female, and 45% were unable to be identified as male or female based upon external visual examination. As expected, the Research Fleet was able to more easily identify the sexes of black sea bass through visual inspection through the spring and summer compared to the reporting period that covers fall and winter, and the percentage of “unknown” sexed black sea bass decreased from 54% in the previous reporting period to 45% in the current reporting period. This decrease is likely a result of the enhanced sexual dimorphism of this species during the mating season in the spring and summer. During the reporting period the Research Fleet sampled black sea bass from a wide size range (6cm - 57cm), of which approximately 66% were discarded (Table 1).

Table 1. Summary of black sea bass biological data collected from the past reporting period covering March 1 to August 31, 2022.

Total Black Sea Bass Sampled	4,681
Percent Male	30%
Percent Female	25%
Percent Unknown	45%
Minimum Size (cm)	6
Maximum Size (cm)	57
Average Size (cm)	28.5
Percent Discarded	66%
Percent Retained	34%

Relative to the reporting periods covering March through August in previous years, trends in both the percentage of discards and mean size of sampled black sea bass were as expected. Compared to the previous reporting period which ended in February 2022, the percentage of discarded fish decreased 13%, and the average size of fish increased by 4.5 cm. These trends are expected as the inshore fishery picks up starting in the spring, when fishermen are targeting the largest black sea bass. Meanwhile, the recently spawned young of the year are still largely too small to be caught by most of the gear types operating in the Research Fleet. We expect the average size to decrease for the next reporting period, beginning in the fall when black sea bass begin their migration offshore and south. At that time of year, young of the year are usually readily caught in abundance by most gear types in the Research Fleet.

During the reporting period the Research Fleet sampled black sea bass from a wide size range similar to the overall size range recorded by the Fleet (Figure 3; Figure 4). This size distribution is similar to that observed in previous reporting periods covering the same months, and the majority of samples fall just above the commercial minimum legal size. As shown in Figure 5, most gear types interact with and discard a wide range of sizes of fish. As expected given the selective nature of the gear, gillnet catches and lands the smallest size range and largest fish overall compared to other gear types. Fish pot, traps, and trawl gear discard the largest size range of fish.

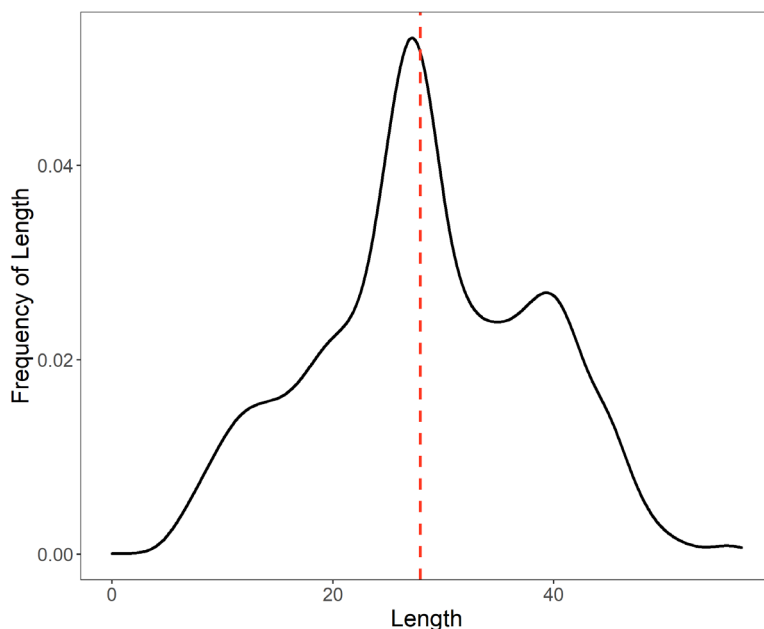


Figure 3. Black sea bass size frequency (n=4,681) sampled through the current reporting period (March 1, 2022 – August 31, 2022). The dashed red line indicates the commercial minimum legal commercial size (11 inches).

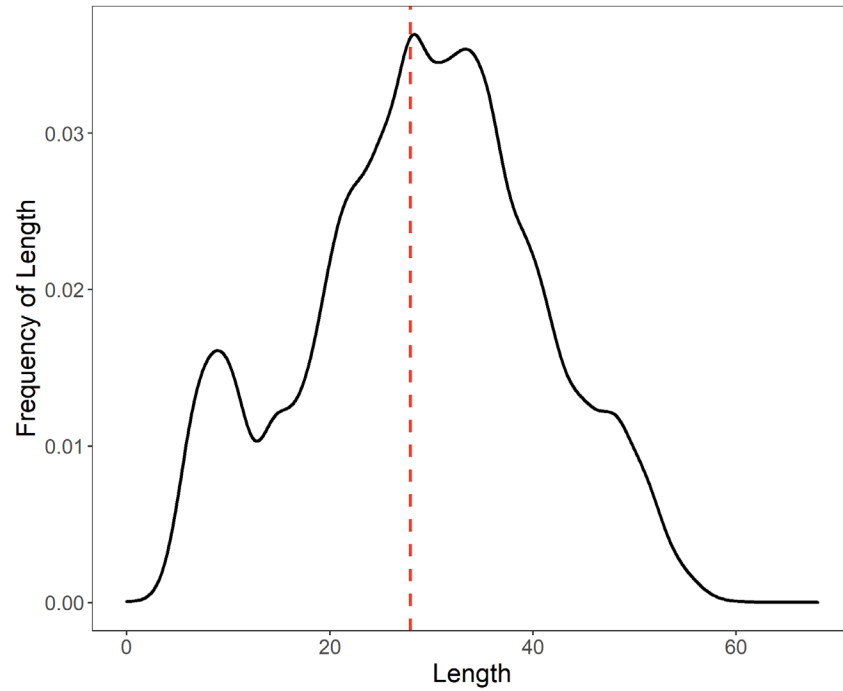


Figure 4. Density plot of black sea bass size frequency ($n=46,221$) sampled since the start of the project (December 1, 2016 – February 28, 2022). The dashed red line indicates the minimum legal commercial size (11 inches).

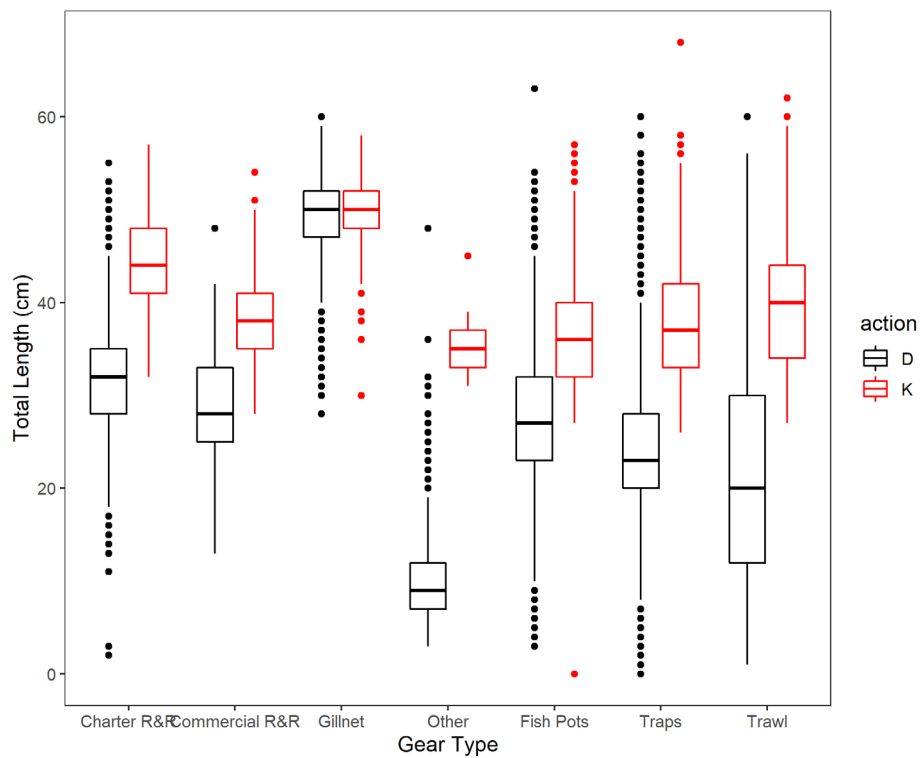


Figure 5. Length boxplots of fish discarded and retained by each gear type throughout the entire span of Research Fleet sampling.

The seasonality of the black sea bass fishery throughout sampling history has remained similar year-to-year, with differences primarily being found in orders of magnitude (Figure 6). For example, each year an increase in the frequency of large discarded fish is observed in the late summer/early fall months. It appears that this trend is continuing in 2022, with an increase in the frequency of large discarded fish occurring throughout the current reporting period. When looking at the seasonality of just the current reporting period, shown in Figure 7, it is apparent that the discard to kept ratio decreased beginning in June. This trend is to be expected, as the commercial black sea bass fishery picks up in late spring/early summer when large fish move inshore. However, large fish well over the minimum commercial legal size were discarded throughout the current reporting period, suggesting that these fish are regulatory discards that are not kept due to management measures such as low daily quotas.

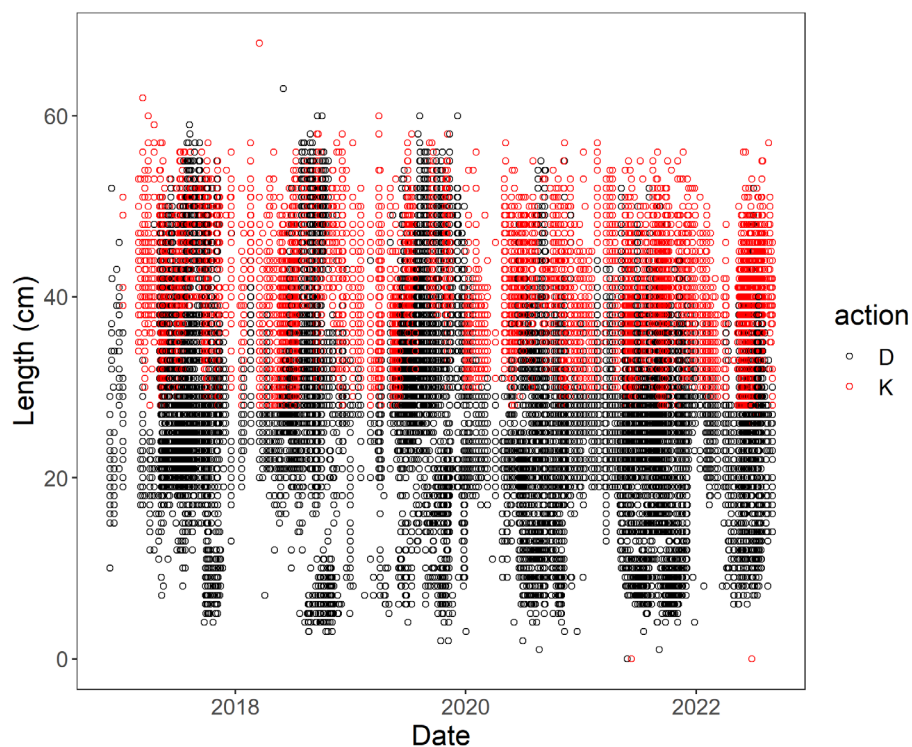


Figure 6. All recorded black sea bass lengths through the time span of Research Fleet sampling (December 1, 2016 through August 31, 2022). Each dot represents a sampled black sea bass colored by kept (K = red) and discarded (D = black) fish.

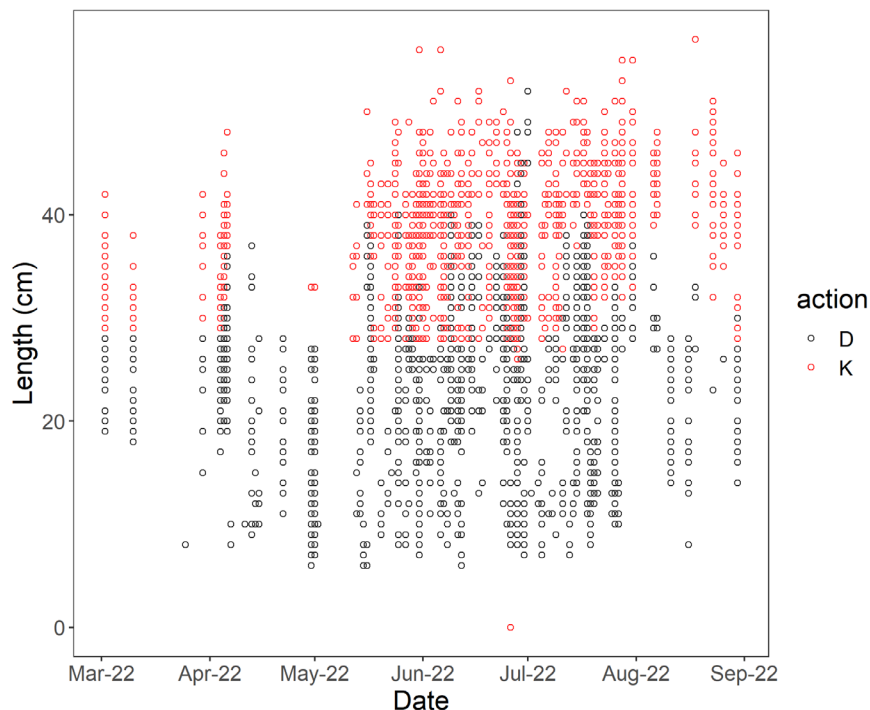


Figure 7. Black sea bass lengths through the current reporting period (March 1, 2022 through August 31, 2022). Each dot represents a sampled black sea bass colored by kept (K = red) and discarded (D = black) fish.

Laboratory Analysis of Black Sea Bass

The laboratory sample collection, tagging, and metadata procedures employed by this project were all maintained during this reporting period. In total, the Research Fleet collected an additional 66 black sea bass for laboratory analysis during this reporting period, all collected by a recreational/charter rod and reel vessel. Samples were collected in RI state waters under a RIDMF Scientific Collector's Permit. Ultimately these black sea bass will be analyzed by RI DEM and aged by the Virginia Institute of Marine Science.

Data Transmission and Communication

In July, the CFRF submitted all project data collected from January 1, 2022 through June 30, 2022 to the ACCSP data coordinator from the previous reporting period, Adam Lee, for inclusion in the ACCSP biosamples data warehouse. The data submission followed the format adopted for the previous data submissions to comply with the data standards set by ACCSP. No changes were requested by the data coordinator.

Outreach and Education

The CFRF has maintained the project webpage throughout the reporting period (<http://www.cfrfoundation.org/black-sea-bass-fleet>) which includes a brief overview of the

sampling protocols and project goals, pictures from at-sea sampling, and any news coverage of the project. CFRF staff have also posted updated sampling numbers and protocols on the webpage throughout the award period. Additionally, project updates such as sampling milestones and photos from the Research Fleet have been distributed on the [CFRF Facebook page](#), which has over 1500 followers. In addition, project Co-PIs submitted a manuscript detailing the project to a [special research topic issue](#) of Frontiers in Marine Science and it is currently undergoing peer-review. The Research Fleet was also featured in the [July 2022 issue of the CFRF Newsletter](#), which reaches over 1500 people.

Collaborations

Project staff have been working closely with the Black Sea Bass Research Track Stock Assessment Working Group to facilitate the use of the Research Fleet data into the 2023 assessment. The length data produced by the Research Fleet will be the primary input into this assessment, and the lengths of discarded fish will be a direct input into the stock assessment models. The Working Group has requested a working paper describing the Research Fleet methods and data produced to include in the assessment report, so project staff have begun working on this.