

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, 2024

Reporting Period: March 1, 2021 – August 31, 2021

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 funded through the same funding source since 2016. Data collected for this project from September 1, 2016 through April 30, 2021 was supported through a single NOAA Award Number NA16NMF4740182. However, data collected from May 1, 2021 through present was supported by NOAA Award Number NA16NMF4740181.

The timeframe of the two awards intentionally overlapped to allow for a smooth transition between awards to eliminate the possibility of a gap in data collection. As a result, data collected during the current reporting period was supported by two separate awards (March through April 2021- NA16NMF4740182; May through August 2021- NA16NMF4740181). However, since data collection and project activities occurred continually throughout the reporting period, all data collected from March 1, 2021 through August 31, 2021 has been combined to produce one interim report for 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;
- **April:** 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;
- **May:** Black Sea Bass Research Fleet data collection; Research Fleet database management; App performance monitoring; Fleet participant support; Fleet participant expansion
- **June:** Black Sea Bass Research Fleet data collection; Research Fleet database management; App performance monitoring; Fleet participant support;
- **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 2021 biannual data submission of Research Fleet collected data to The Atlantic Coastal Cooperative Statistics Program (ACCSP) biosamples database;
- **August:** Black Sea Bass Research Fleet data collection; Research Fleet database management; App performance monitoring; Fleet participant support; Annual Fleet meeting

The overall timeline for the project is as follows:

- **May 2021 – August 2024:** 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.
- **September - December 2024:** CFRF & RI DEM analyze data and prepare final report.

### Tasks Accomplished in Reporting Period:

#### *Maintenance of On Deck Data Tablet Application and MySQL Database*

Work during this reporting period relative to On Deck Data (ODD) was focused on communication with Research Fleet participants to identify and attempt to resolve any application or tablet related issues. A substantial update to ODD was released during this reporting period. However, the update was primarily geared towards improving Bluetooth connection, utilized by the lobster/crab version of ODD, to connect more reliably with Bluetooth calipers under new versions of Android operating system. The update did not directly change the Black Sea Bass Research Fleet version of ODD. However, two Research Fleet Participants with older versions of Android Tablets had issues using ODD after this update. This only affected sampling for a few weeks, and the tablets were replaced and upgraded as soon as possible. Both participants are now able to continue sampling as usual, and no other issues have been reported by Research Fleet participants for the ODD app.

In August, the server to which ODD uploads data had to be updated. The server migration occurred in the evening, when participants are not typically using the app. The server migration was successful and did not affect data collection or upload.

### *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, expansion of the Research Fleet, and meeting with participants during an annual Fleet meeting.

Due to the reduction in sampling effort in the previous reporting period relative to previous years due to COVID-19, as well as the retirement of two vessels from the Fleet in 2020, the CFRF projected an excess in funds dedicated to vessel sampling stipends. As a result, project Co-PIs decided to bring in additional fishing vessels to the Research Fleet. Consistent with the previous reporting period, considerations for vessel additions were focused on increasing samples from fish pot vessels, as well as increasing spatial coverage of the Research Fleet. In the previous reporting period, Joseph Wagner Jr. and Joseph Wagner Sr., of F/V Saturn and F/V Savannah Paige, respectively, were recruited into the Research Fleet as two fish pot vessels from New Jersey. However, as the fish pot fishery in New Jersey typically begins around mid-April, the Wagners were not trained for the Fleet during the previous reporting period, and were instead trained and onboarded during the current reporting period, just prior to the commencement of their fishing season. These two New Jersey vessels were able to begin sampling this May, and they have already greatly increased the Fleet's data coverage in the Mid-Atlantic.

In addition, two additional Rhode Island fish pot fishermen, Derek Pascale, F/V Ragged Edge, and Bill Cote, F/V New Hope, were brought onto the Fleet in May. Both new participants are based in Point Judith, RI. They were trained and provided with sampling gear in May, and they have been consistently sampling black sea bass using ODD since.

All other previous Research Fleet participants have been retained from the prior reporting period; a full list of Research Fleet members is provided below. All vessels proposed to be added to the Research Fleet through the year-4 funding from ACCSP have been added.

- Tim Baker, F/V Laura Lynn - Point Judith, RI
- Rick Bellavance, F/V Priority Too - Point Judith, RI
- Aaron Gewirtz, F/V Reyna & Kerstin & F/V Johnny B - Point Judith, RI
- Eric Lundvall, F/V Rayna & Kerstin - Point Judith, RI
- Mike Monteforte, F/V Second Wind - 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
- John Walker, F/V Virginia Bae & F/V Blue Label – 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 quarterly reports in April and July 2021 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.

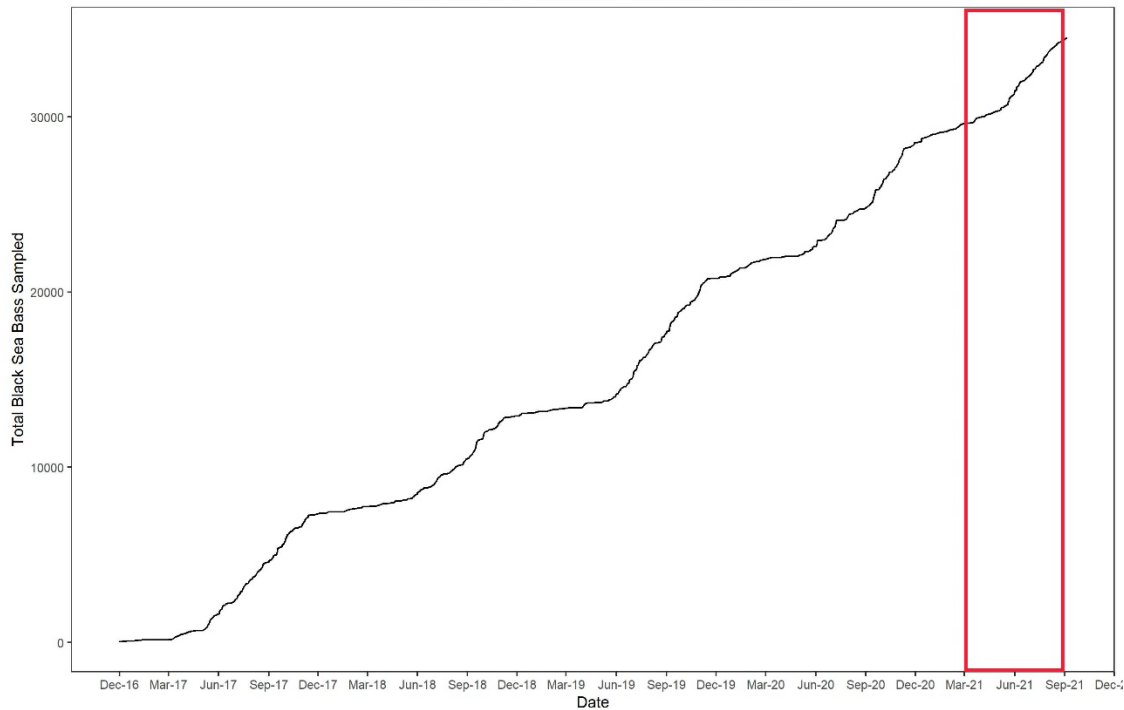
In August, the CFRF hosted an annual Black Sea Bass Research Fleet Meeting at the CFRF office in Kingston, RI. All Fleet participants, members of the project steering committee, and project Co-PIs were invited to attend. The meeting was held outdoors where social distancing could be maintained to comply with COVID-19 safety precautions. At the meeting, CFRF staff presented an update on the Fleet and project as a whole and provided a summary of the data collected since the beginning of this project. A copy of the slides presented are included as a support document to this report. During the meeting, CFRF staff and project Co-PIs opened up a discussion with the Fleet members in attendance to better understand their observations, perceptions, and concerns of/for the black sea bass fishery. The upcoming Black Sea Bass Research Track Stock Assessment, which is currently in progress, was also discussed in the context of how the data collected from the Fleet could be used.

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 if needed and attempted to do so remotely as much as possible. Common tasks related to Fleet support include; invoicing assistance, data upload assistance, sampling equipment maintenance 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 similar to previous years, excluding sampling during the beginning of the COVID-19 pandemic. In this reporting period, 4,778 black sea bass were sampled from a total of 128 sampling sessions. Only 2,972 black sea bass were sampled in the same period in 2020, however this number was much lower than usual due to the COVID-19 pandemic. For example, in 2019, when sampling was occurring as usual, 4,291 fish were sampled from March through August. With the addition of

the black sea bass recorded in the current reporting period, a total of 34,396 black sea bass have been sampled from 2,075 separate sampling sessions between December 1, 2016 and August 31, 2021.



*Figure 1. Time series of black sea bass sampling efforts by the Black Sea Bass Research Fleet from December 1, 2016 to August 31, 2021. The current reporting period is marked with a red box. The total number of black sea bass sampled through August 31, 2021 = 34,396.*

As seen in Figure 1, 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.

During the current reporting period, the Research Fleet averaged 37 black sea bass sampled per session, which represents a substantial increase to the number of black sea bass recorded per session compared to previous years in the same time period (17 fish was the average for these months in 2020). 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). However, this year, 5 new fish pot vessels began sampling in May and June, which likely contributed to the greatly increased number of fish sampled per session.

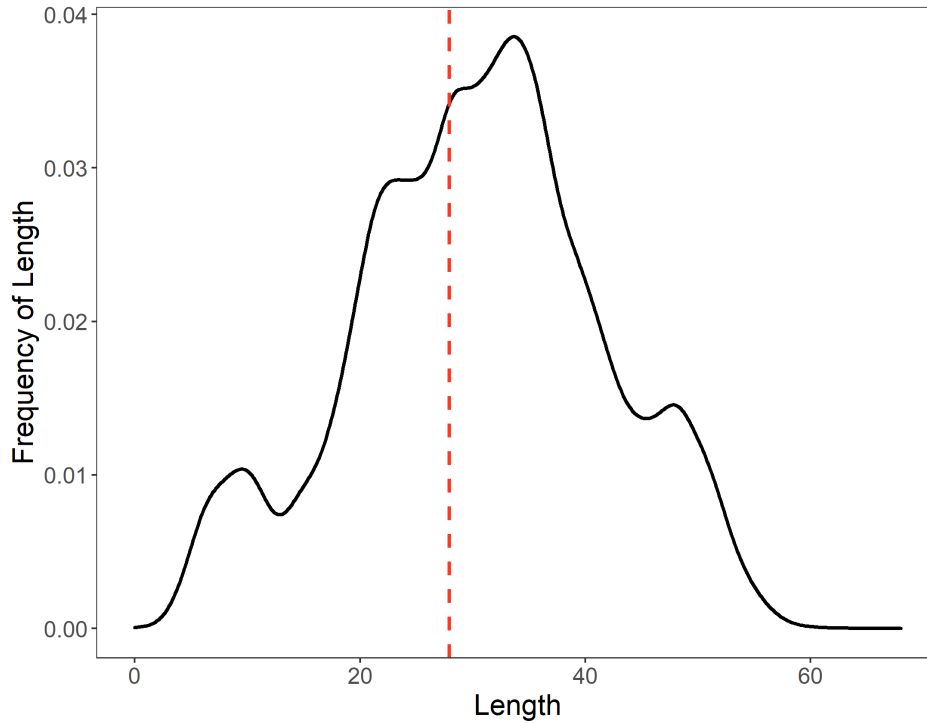
Of the 4,778 black sea bass sampled by the Research Fleet during this reporting period, approximately 25% were male, 44% were female, and 31% were unable to be identified as male or female based upon external visual examination. As expected, the Research Fleet was able to more easily identify the sexes 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 38% in the previous reporting period to 31% 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 (3cm - 55cm), of which approximately 64% were discarded (Table 1).

*Table 1. Summary of black sea bass biological data collected from the past reporting period covering March 1, 2021 to August 31, 2021.*

Total Black Sea Bass Sampled	4,778
Percent Male	25%
Percent Female	44%
Percent Unknown	31%
Minimum Size (cm)	3
Maximum Size (cm)	55
Average Size (cm)	30
Percent Discarded	64%
Percent Retained	36%

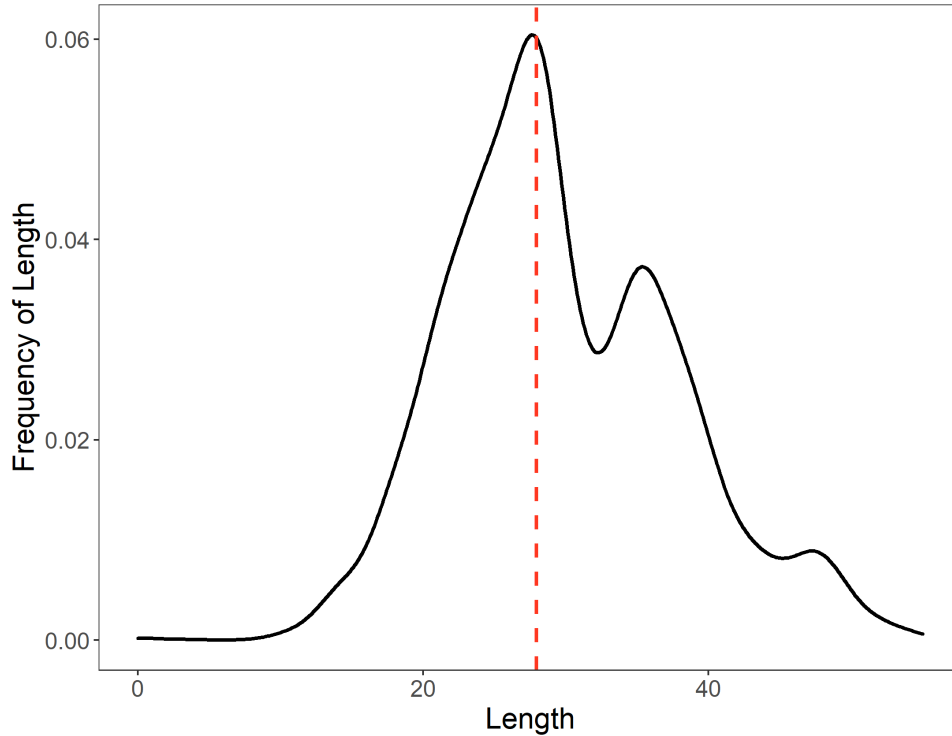
Relative to the reporting periods covering March through August in previous years, trends in both the percentage of discards and mean size of sampled black sea bass were as expected. Compared to the previous reporting period which ended in February 2021, the percentage of discarded fish decreased 10%, and the average size of fish increased by 3 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.

Figure 2 shows the updated size frequency of all black sea bass sampled by the Research Fleet since commencement of sampling in December 2016. The majority (62%) of black sea bass sampled have been above the Rhode Island legal minimum size, yet the majority (69%) of sampled fish have been discarded. In fact, 45% of discarded fish have been over the minimum legal commercial size, resulting in 31% of all black sea bass sampled by the Research Fleet being legal-sized discarded fish.



*Figure 2. Density plot of black sea bass size frequency (n=34,396) sampled since the start of the project (December 1, 2016 – August 31, 2021). The dashed red line indicates the minimum legal commercial size (11 inches).*

Figure 3 illustrates the size frequency of black sea bass sampled by the Research Fleet only during the current reporting period. This size distribution is similar to that observed in previous reporting periods covering the same months, with samples representing a large range of lengths and the majority of samples falling just above the commercial minimum legal size. The size frequency distribution of black sea bass in the current reporting period is shifted to the left compared to the overall size frequency displayed above in Figure 2.



*Figure 3. Black sea bass size frequency (n=4,778) sampled since the beginning of the current reporting period (March 1, 2021 – August 31, 2021). The dashed red line indicates the commercial minimum legal commercial size (11 inches).*

Figure 4 shows the seasonality of the black sea bass fishery and sampling history. Seasonal trends have remained similar from year to year with differences only being found in orders of magnitude. 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 2021, with an increase in the frequency of large discarded fish occurring throughout the current reporting period.



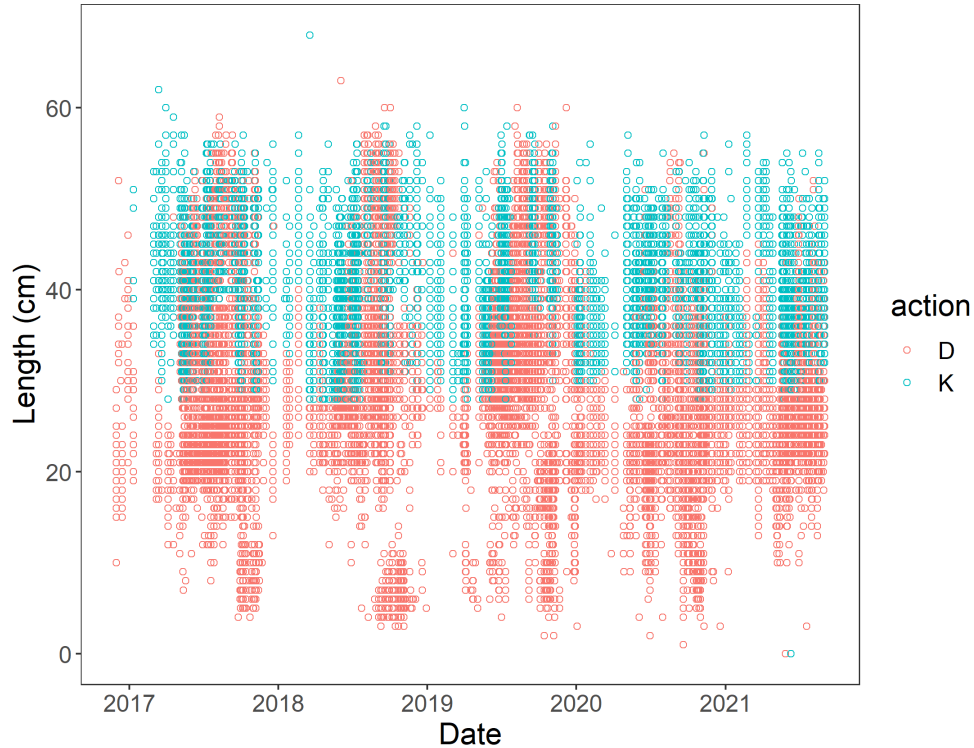


Figure 4. All recorded black sea bass lengths through the time span of Research Fleet sampling (December 1, 2016 through August 31, 2021). Each dot represents a sampled black sea bass colored by retained (K = blue) and discarded (D = red) fish.

When looking at the seasonality of just the current reporting period, shown in Figure 5, 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.

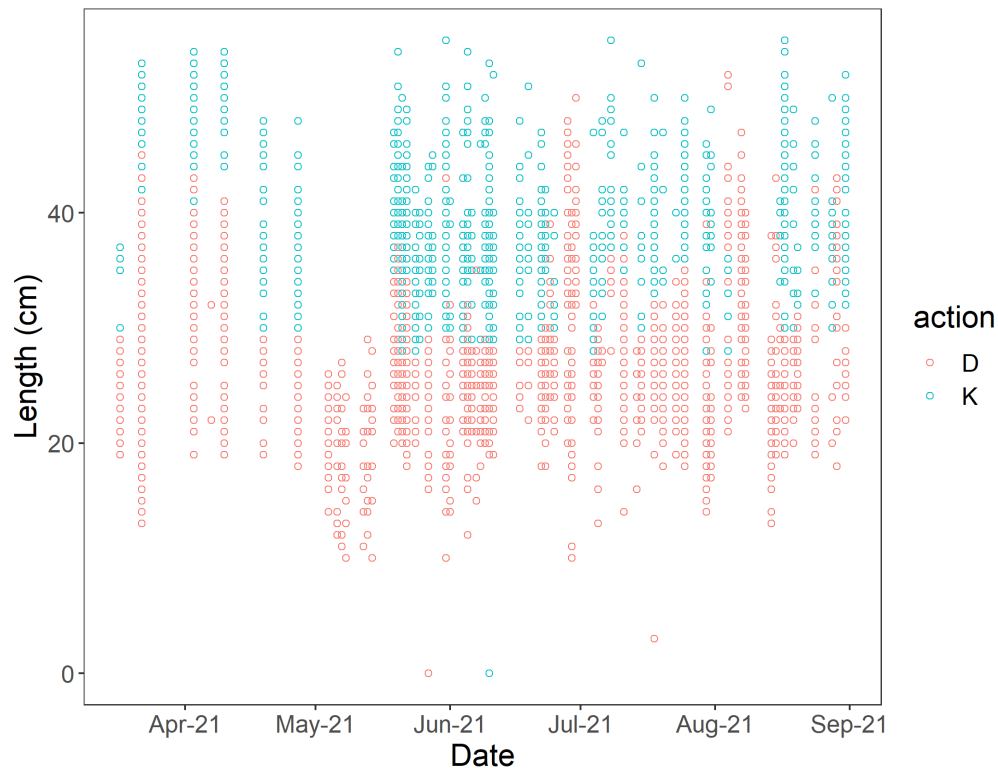


Figure 5. Black sea bass lengths through the current reporting period (March 1, 2021 through August 31, 2021). Each dot represents a sampled black sea bass colored by retained (K = blue) and discarded (D = red) fish.

#### 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 CFRF collected an additional 42 black sea bass for laboratory analysis during this reporting period. 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, 2021 through June 30, 2021 to the ACCSP data coordinator, Lindsey Aubart, for inclusion in the ACCSP biosamples data warehouse. The data submission followed the format adopted for the last 2020 data submission to comply with the data standards set by ACCSP. The data submission was accepted by the data coordinator on July 29, 2021.

#### Outreach and Education

The CFRF has maintained the project webpage (<http://www.cfrfoundation.org/black-sea-bass-fleet>) and posted updated sampling numbers and protocols on the webpage throughout the reporting period. Additionally, project updates such as sampling and collection milestones and photos from the Fleet have been distributed on the CFRF Facebook page. The CFRF also sent

out an updated newsletter, which documents all current and upcoming projects including the Black Sea Bass Research Fleet, to all subscribed to the mailing list through both mail and email. CFRF staff have also submitted an abstract to present results from this project at the upcoming American Fisheries Society in November. In addition, project Co-PIs are currently working on a manuscript detailing the project, and it is anticipated that this will be submitted for peer-review soon.

### *Collaborations*

Due to the collaborative nature of the Research Fleet, project Co-PIs have always been very receptive of fostering future collaborations and leveraging the time on the water of the Research Fleet to aid other regional research centered on black sea bass. As a result, the Black Sea Bass Research Fleet once again contributed to a research project being conducted at Northeastern University. This August, the CFRF arranged an at-sea day with one of the newest Research Fleet members to collect black sea bass samples while at-sea. The work was part of several larger projects run by PIs Jonathan Grabowski and Katie Lotterhos at Northeastern University to investigate differences among black sea bass across three distinct geographic zones in the northern range of the species. The projects also seek to sequence the black sea bass genome, which can be used to help evaluate population structure. Three NEU researchers joined the lead CFRF biologist on the F/V Ragged Edge for this sampling day, and approximately 100 black sea bass were sampled for this collaboration.

In addition, there was an opportunity to form a new collaboration through the project Steering Committee. A vacancy on the Steering Committee was created by the retirement of Mr. Gray Shepherd from the Northeast Fisheries Science Center. He was replaced by Ms. Emily Keiley, the Greater Atlantic Regional Fisheries Office policy analyst for black sea bass. This collaboration broadens the expertise of the Steering Committee as Ms. Keiley represents a connection to federal policy formation not previously present.