

Proposal for Funding made to:  
Atlantic Coastal Cooperative Statistics Program  
Operations and Advisory Committees  
1050 N. Highland Street, Suite 200 A-N  
Arlington, VA 22201

**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**

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**Applicant Name:** Rhode Island Department of Environmental Management (RI DEM) and the Commercial Fisheries Research Foundation (CFRF)

**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

**Project Type:** Maintenance (Year 6 of Maintenance)

**Requested Award Amount:** \$43,635

**Requested Award Period:** August 1, 2024 – July 31, 2025

**Principal Investigators:** Jason McNamee, PhD, Deputy Director of Natural Resources, Rhode Island Department of Environmental Management, and David Bethoney, PhD, Executive Director, Commercial Fisheries Research Foundation

**Date Submitted:** June 15, 2023

This is the sixth and final maintenance proposal to support the continued data collection by the Black Sea Bass Research Fleet. There are no major changes to the scope of work proposed in the current proposal compared to prior years. However, due to the budget reductions associated with a final maintenance proposal the size of the Research Fleet has been reduced to its original size of eight vessels. Other changes to this proposal include updated timelines throughout, updated data in the *Internal Data Analysis* subsection, and the proposed budget. In addition, Thomas Heimann left his position as a Research Biologist at the CFRF and is thus no longer working on this project; as a result, he is no longer listed as a Principal Investigator. We are thankful for the 7 years of work that he contributed to this project.

## **Objective:**

This proposal is a request for financial support for an additional 12 months of biological catch, effort, and bycatch sampling by the Black Sea Bass Research Fleet, which was successfully piloted in 2016 with support from ACCSP and has been in continuous operation since. From 2016 through April 30, 2023, the Research Fleet has sampled 53,109 black sea bass from 2,866 locations throughout southern New England and the Mid-Atlantic. The Research Fleet will continue data collection through July 31, 2024 (Year 7 of funding from ACCSP). All biosamples data collected by this project during previous years of funding have been communicated to and accepted by ACCSP bi-annually. This data is being utilized in the current Black sea bass stock assessment with direction for expanded use expected to be provided by stock assessment scientists. The project team will continue to deliver data to ACCSP in this manner throughout Year 7 of funding, and the proposed project will allow for the continued collection and communication of black sea bass data through July 31, 2025.

The goal of the proposed project is to continue the Research Fleet's sampling efforts to develop a year-round, long-term time series of black sea bass (*Centropristis striata*) catch, bycatch, and biological data for five different gear types (trawl, lobster/crab pot, fish pot, gillnet, rod and reel) throughout the Southern New England (SNE) region and reaching into the Mid-Atlantic (MAB) region. The continuation of this project is critical to the evolution of black sea bass assessment and management efforts by the Atlantic States Marine Fisheries Commission, Mid-Atlantic Fisheries Management Council, Northeast Fisheries Science Center, and Atlantic Coastal Cooperative Statistics Program as the Black Sea Bass Research Fleet produces spatially and seasonally distinct catch data for numerous commercial and recreational gear types, which is currently lacking for this species.

Project components include: 1) Continue the existing fishery dependent data collection program that utilizes fishing vessels and a custom designed sampling application to collect and relay biological catch and bycatch data (number, length, sex, disposition) and fishery characteristics (location, gear type, effort, habitat) for black sea bass from across the SNE/MAB region throughout the year; 2) Internal data analysis to address research questions about spatiotemporal patterns in black sea bass biological and fishery characteristics and gear-specific selectivity; and 3) Communication of project data and results to the Atlantic Coastal Cooperative Statistics Program (ACCSP), black sea bass stock assessment scientists, managers, and members of fishing industry.

In summary, the general goals of the proposed project are:

- 1) Collect and communicate critically needed fishery dependent black sea bass data (catch and effort, bycatch, and biological) in a cost-effective way using modern electronic technology and fishermen's time on the water;
- 2) Contribute to the evolution of the northern Atlantic black sea bass stock assessment and associated management measures;

- 3) Demonstrate a model for fishery dependent data collection, management, analysis, and utilization that can be duplicated in a cost-effective way in other regions of the black sea bass range and in other fisheries.

Specific objectives include the following:

- Continue the Black Sea Bass Research Fleet for an additional 12 months to further refine seasonal characterizations of northern Atlantic black sea bass biology and distribution;
- Collect fishery dependent black sea bass data from five gear types (trawl, lobster/crab pot, fish pot, gillnet, rod and reel) across the SNE/MAB region to characterize the size and sex distributions of black sea bass catch and bycatch and investigate the spatial and temporal trends of the fishery;
- Maintain and evolve the On Deck Data application to meet the data needs of scientists and the logistical needs of participant fishermen;
- Communicate black sea bass biosamples data to ACCSP every six months;
- Ensure all project data is available to Northeast Fisheries Science Center (NEFSC) scientists for inclusion in Black Sea Bass Stock Assessments
- Conduct internal analyses of the project database to: 1) Assess the selectivity and CPUE of five gear types in the SNE/MAB region and explore temporal variability, and 2) Further monitor and assess spatial and temporal trends in species' catch and bycatch composition and fishery characteristics;
- Further refine gear-specific fishery dependent indices that utilize different data error structures, standardization techniques, and Bayesian applications;
- Communicate to a broad audience the benefits and inherent value in this type of collaborative data collection program.

### **Need:**

As asserted in the ACCSP Biological Review Panel's biological sampling priority matrix, black sea bass is identified as a top priority species for data collection, receiving the highest total priority ranking for inadequate biological sampling (ACCSP 2023), and the species remains a high priority for managing stakeholders (ASMFC, NMFS, and state agencies). In recent decades, the distribution and center of biomass of black sea bass has been experiencing a northward shift, likely due to climate change (Bell et al. 2014). As a result, the lack of adequate data for northern Atlantic black sea bass in particular is an issue of regional importance, as this highly valuable stock ranges from Cape Hatteras to the Gulf of Maine (Musick & Mercer 1977, Moser & Shepherd 2009). In part due to the dearth of data throughout the black sea bass range, assessment and management efforts have been slow to react to the shifting distribution of the species and growing abundance of the northern stock (Bell et al. 2014, NEFSC 2017). As stated by ASMFC (2019), high priority data needs for black sea bass include increased sampling of commercial landings and sample size of observed charter trips. The Black Sea Bass Research Fleet has, and will continue to with additional funding, provide precisely this information.

Ultimately, cost-effective sampling programs, such as the Black Sea Bass Research Fleet, are needed to collect these data on regional scales and inform and evolve the stock assessment to consider the complex life history and ever evolving spatial structure of black sea bass.

Fishery dependent data has become an important source of information that is used as a term of reference for many stock assessments, but in the case of the northern Atlantic black sea bass stock, the data generated by the Black Sea Bass Research Fleet serves as the only systematically collected fishery dependent data source with a focus on the data being used in the assessment process. Thus, this project seeks to strengthen the fishery dependent data for this population to provide better information from across the temporal and spatial distribution of the northern stock.

The limited coverage of optimal black sea bass habitat and semi-seasonal (spring/winter) sampling schedule of the NEFSC trawl survey may limit the suitability of the survey data for the stock assessment (ASMFC 2013) and require the addition of new data streams to improve the information available to assessment. Recent stock assessments for the southern Atlantic black sea bass stock have adapted sampling and analytical techniques to better fit the life history and habitat associations of black sea bass. These stock assessments rely heavily on fishery-dependent data collected from multiple commercial and recreational fleets representing multiple gear types to inform the stock assessment model using data such as annual length compositions of landings and discards, gear selectivity curves, and indices of abundance (SEFSC 2013; SEDAR 2018). Such fishery-dependent parameters, however, have not yet been developed for the northern Atlantic black sea bass stock due to insufficient data, but will become possible if the Black Sea Bass Research Fleet is able to amass a robust time series of data. This project aims to address this need by maintaining the existing Black Sea Bass Research Fleet to conduct year-round biological sampling of black sea bass fishing effort, catch composition, and discard composition within the trawl, lobster/crab, fish pot, gillnet, and rod and reel fisheries in the SNE/MAB region. The northern Black Sea Bass Research Track Stock Assessment is currently underway, and the Working Group has voted to include the Black Sea Bass Research Fleet length and disposition data in the upcoming assessment. Continued data collection that extends the timeseries and increases sampling coverage for gear types and times of year under-sampled by other data sources will ensure that the data continues to become more useful to each successive stock assessment.

Ultimately, the proposed project will help meet ACCSP's mission of improving data quality for fisheries science. In addition, this project, and its integration with the ACCSP data housing program, will lend to the other mission of the ACCSP, namely by contributing to a single data management system that will meet the needs of fishery managers, scientists, and fishermen. Collecting timely scientific data across a species range is imperative for successful fisheries management, as more robust data enables fisheries science to be as comprehensive as possible, which in turn supports informed and efficient decision making by managers. Furthermore, stock assessment scientists rely on robust biological, catch and effort, and bycatch data to help improve the quality of stock assessments. In these ways, the proposed project meets all the main elements of the mission of ACCSP.

Rhode Island Department of Environmental Management & Commercial Fisheries Research Foundation

ACCSP Funding Proposal (Maintenance Project – Project Year 8, Maintenance Year 6): Fishery Dependent Sampling for Black Sea Bass (*Centropristis striata*)

Proposal components that address the ranking criteria are underlined and a summary is provided on pages 30-33.

## **Results and Benefits:**

The results of the proposed project include:

- Improved quality, quantity, and timeliness of biological, catch and effort, and bycatch data for the northern Atlantic black sea bass, made available via the ACCSP;
- A vetted source of year-round black sea bass data that can be used to inform the stock assessment and management of this data poor species;
- Coordinated data transmission procedures with the ACCSP that follow the CFRF's existing data communication practices with ACCSP;
- A demonstrated, cost effective, method to collect data for a commercially and recreationally important species from areas and times of year not accessed by existing survey programs;
- Improved collaboration and trust between fishermen, scientists, and managers;
- Improved accuracy and credibility of the stock assessment and management plan for the northern Atlantic black sea bass stock;

The benefits of the proposed project are:

- Address priorities of ACCSP by providing critically needed black sea bass data from the SNE/MAB region to support assessment and management efforts that reflect the current state of the resource;
- Provide an efficient and constructive way for fishermen to be involved in the scientific process by using modern technology to collect quantitative black sea bass data during routine fishing practices;
- Fill black sea bass data gaps in areas, habitats, and times of year not covered by standard survey techniques;
- Evolve and improve the black sea bass stock assessment by providing expanded biological data from retained and discarded black sea bass from a variety of gear types;
- Support regional science and management agencies, including ACCSP, ASMFC, MAFMC, and state agencies in their efforts to sustainably manage the black sea bass resource;
- Support diversification and resilience of fishing communities in the many states across the Atlantic coast with a black sea bass fishery;
- Provide a model for cost-effective fishery dependent data collection efforts in other regions and fisheries.
- Build strong working partnerships between fishermen, scientists, and managers that will contribute to the sustainable management of the nation's living marine resources;
- Build confidence in the efficacy of the northern Atlantic black sea bass stock assessment and management process.

## **Data Delivery Plan:**

An important component of the proposed project is the compilation and communication of fishery and biological data to the ACCSP, participant fishermen, stock assessment scientists, and

management teams, which will allow this project to have the greatest impact on black sea bass management as possible. The CFRF will maintain the black sea bass database for internal project analyses (described below) but will also regularly share the project data with other users, regardless of any internal publication endeavors.

Copies of the black sea bass database will continue to be sent bi-annually (every six months) to the ACCSP. These data will be compiled in a format that is compatible with the ACCSP database to encourage data be readily used in the black sea bass stock assessment and other analyses. Data submissions to the ACCSP will build upon the established procedures from the first five years of the project. All data provided to the ACCSP will match ACCSP data collection standards and any requested and available metadata will be provided. Throughout the project, data will also be made available to fishery scientists at the NMFS Northeast Fisheries Science Center. A vessel ID system will be used to maintain the confidentiality of participant fishing vessels. The CFRF will maintain open communication with the ACCSP data coordinator and will remain available to provide any necessary information along with data submissions.

To provide regular feedback to fleet participants, the project team will compile and distribute individual data reports to vessel captains every three months (quarterly). Vessel-specific data reports will include the raw data collected by that vessel during the reporting period as well as the following summary statistics: number of catch sampling sessions, amount of effort sampled (number of trawls, hooks, traps, etc.), average depth of sampling, percentage of black sea bass catch retained for sale, percentage of black sea bass catch discarded, number of black sea bass biologically sampled, sex distribution of black sea bass sampled, minimum/maximum length of black sea bass sampled, and average length of black sea bass sampled. Additional summary statistics will be available upon request. Data reports were compiled and distributed to Research Fleet participants following the above-mentioned quarterly time frame and content guidelines throughout the entirety of past project sampling.

#### **Completed Data Delivery to ACCSP:**

During the first funding year of the project, the CFRF and RI DEM worked with the current ACCSP Data Coordinator to coordinate data formats, metadata, and delivery procedures for the Research Fleet's black sea bass biosamples data. In addition, in year 4 of the project, the project team worked with the ACCSP Data Coordinator to update the Black Sea Bass Research Fleet data submission to follow the updated ACCSP biosamples data format. As a result of these efforts, all black sea bass biosamples data collected to date through the funded project have been incorporated into the ACCSP black sea bass biosamples database. The CFRF has maintained the bi-annual data submission to the ACCSP and submits data in January and July of each sampling year. The project team will maintain a bi-annual data delivery schedule to ACCSP throughout the proposed project following the same data formats and standards previously established, as well as any requested updates from ACCSP.

Currently, the Research Fleet collects a suite of additional effort data beyond that which is included in the biosamples data (Table 1). To date, this effort data has not been included with past data submissions as the biosamples database at ACCSP is not set up for its inclusion. Continued efforts will be made by the CFRF and RI DEM to incorporate and share all effort data, including retroactively, with the ACCSP.

### **Approach:**

The proposed project seeks to collect, communicate, and analyze critically needed catch, bycatch, and biological data for incorporation into the ACCSP biosamples database and ultimate application in the northern Atlantic black sea bass stock assessment. Project components include: 1) Maintenance of the current Black Sea Bass Research Fleet; 2) Collection of fishery-dependent biological (catch and bycatch) black sea bass data and fishery characteristics for 12 months in the SNE/MAB region; 3) Internal data analysis to address research questions about spatiotemporal patterns in the black sea bass population and fishery; 4) Compilation and communication of project data and results to ACCSP, stock assessment scientists, and fisheries managers; and 5) Outreach and education activities to share findings. Methodological details are outlined below.

#### *Maintenance of Black Sea Bass Research Fleet and Data Collection App:*

During the first funding year of this project, the CFRF and RI DEM were successful in developing the Black Sea Bass Research Fleet for fishery dependent data collection, including the development of a Project Steering Committee, solicitation and selection of participant fishing vessels, development of the On Deck Data application and SQL database, refinement of sampling protocols, construction of sampling equipment, training of Research Fleet participants, on-time initiation of data collection, data delivery to ACCSP and professional and industry outreach. The project was implemented by the PIs, CFRF staff, and a Project Steering Committee, which consists of members of the fishing industry as well as state and federal fisheries scientists and managers. Currently the project is run by the PIs and CFRF staff, and the project steering committee serves in an advisory role and provides feedback on project progress and major milestones as needed. More information about project accomplishments is available on the project website: [www.cfrfoundation.org/black-sea-bass-research-fleet](http://www.cfrfoundation.org/black-sea-bass-research-fleet).

If funded, during the eighth year of the project, the CFRF and RI DEM will make all efforts to maintain all active fishing vessels supported through year-7 funding from ACCSP. It is important to maintain the current members of the Research Fleet for as long as possible. Ultimately, when data will be applied to the stock assessment or validated in regards to other sources of black sea bass data, having participation from the same vessels throughout the time series will allow project staff to investigate potential vessel effects evident in the data. The sampling rate of the Research Fleet is dictated by the highly seasonal variation of black sea bass catch and bycatch in various fisheries across southern New England and the Mid-Atlantic. As a result, the sampling rate by the Research Fleet fluctuates from year to year.



The black sea bass data collection application, On Deck Data, was developed during the first year of the project to enable Research Fleet participants to collect standardized black sea bass data as well as day-to-day observations. On Deck Data prompts participant fishermen to record a suite of session data (location, depth, etc.) and biological data (length, sex, disposition) while at sea. To account for the multi-gear nature of the black sea bass fishery, On Deck Data prompts gear-specific data entry for Research Fleet participants (Table 1). On Deck Data was originally launched during the first year of the project and has received various improvements and quality of life updates in each funded year to streamline data collection.

*Table 1. Summary of fishing effort data collected by the Black Sea Bass Research Fleet.*

Trawl	Gillnet	Commercial Rod & Reel	Charter	Lobster/Crab Traps	Fish Pot
Mesh Size (inches)	Number of Net Panels Per String	Time Spent Fishing (hours)	Time Spent Fishing (hours)	Soak Time (days)	Soak Time (days)
Tow Time (hours.decimal)	Length of Net Panels (feet)	Number of Rods Fished	Number of Rods Fished	Number of Traps	Number of Traps
Sweep Length (feet)	Mesh Size (inches)	Number of Hooks Used	Number of Hooks Used	Escape Vent Size (inches)	Escape Vent Size (inches)
	Soak Time (days)			Escape Vent Shape	Entrance Size (inches)
	Net Height (feet)				
	Tie Downs (inches)				

On Deck Data will be maintained throughout the proposed project to allow for efficient data collection and wireless data submission by Research Fleet participants. The CFRF and RI DEM will continue to work with an application developer to address any issues that arise and to update On Deck Data to maintain functionality. Application maintenance is a constant task, as tablets regularly receive operating system updates that may impact On Deck Data functionality. On Deck Data has to receive regular updates to specifically allow for compatibility with accessing and uploading data via wireless internet on new versions of the Android operating system. Further, as tablet models receive minor hardware changes between annual models, reformatting screens of On Deck Data to display properly across tablet models is anticipated.

The Black Sea Bass Research Fleet will continue to follow the fishery-dependent sampling protocols implemented during the first year of the project to collect catch and effort, biological, and bycatch data from the SNE/MAB region. The percentage of project effort devoted to each of these modules is as follows: Catch and Effort 25%, Biological 50%, Bycatch 25%. The estimated project effort devoted to biological sampling reflects the collection of black sea bass length and sex data by participant vessels during three trips per month for 12 months. The intention of data collection is to provide a biological characterization of the catch and discards of black sea bass from a variety of gear types in the SNE/MAB regions. The estimated effort devoted to the catch and effort module is based upon sampling during the open black sea bass

fishing season, sub periods open to commercial fishery exist nearly year-round. Further due to the multi-gear nature of the Research Fleet, every vessel interacts with black sea bass as targeted catch or bycatch differently even during open periods. Finally, the project effort allocated to the bycatch module reflects sampling efforts conducted while the commercial black sea bass fishing season is closed and while participant vessels are targeting other species. Due to the low daily allocation through the summer and fall seasons in Rhode Island, there is still a large portion of bycaught black sea bass sampled after vessels have hit their daily limits.

#### *Fishery-Dependent Data Collection:*

The Black Sea Bass Research Fleet started collecting data on November 30, 2016 and, if this proposal is funded, will continue to do so utilizing the established sampling protocols and procedures through at least July 31, 2025 (through Year 8 of ACCSP funding). The Black Sea Bass Research Fleet currently consists of fourteen active fishermen based in Rhode Island and New Jersey, chosen strategically to provide data coverage from across the SNE/MAB region, throughout the year, from a variety of gear types.

Participant fishermen will use Samsung Tab A tablets pre-programmed with On Deck Data, described above, to efficiently and accurately record and transmit fishery dependent data. As such, the proposed project will advance the use of electronic technology in at-sea biological data collection, management, and analysis efforts. The goal for each participant is to conduct at-sea catch sampling sessions during three fishing trips each month (Nelson 2014). Thus, across the 14 active vessels, the Black Sea Bass Research Fleet will aim to sample up to 42 trips per month, resulting in as many as 504 trips over twelve months. Given the population inferences implied in the project objectives and the aggregating nature of black sea bass, a biological sampling (length/sex) minimum of 50 black sea bass per location will be the required (Zhang & Cadrin 2012). With a goal of sampling three locations per month, the Research Fleet may sample up to 25,200 black sea bass over the course of the year.

The realized sampling frequency, however, will be dependent on a variety of factors, including weather, seasonal black sea bass distribution, and fishery closures. Further, due to the high seasonality of a large portion of the Black Sea Bass Research Fleet, fishery sampling frequency exhibits high seasonal fluctuations. Due to the multi-gear nature of the Research Fleet, the proposed sampling targets do not adequately represent the fishing schedules for each gear type. For example, due to the low daily catch limit (50 pounds per day per vessel for most of the year) in Rhode Island for black sea bass if a fishing vessel is only targeting black sea bass on a day trip and the limit is caught, all fishing ceases. This leads to instances where sampling 50 black sea bass per location becomes unfeasible as fishing may have already stopped prior to landing 50 black sea bass. Further, many of the larger trip vessels are mainly retaining their daily or trip limits of black sea bass from bycatch while targeting other species, which again leads to instances of fishing ceasing prior to 50 black sea bass caught. However, the goal of sampling 150 black sea bass per month remains to ensure statistical power. Vessels may sample fewer fish from more than three locations to reach the 150 fish per month target. Further, the

same scenario occurs in highly mobile fishing gears, such as charter and commercial rod and reel, which will often change locations prior to catching 50 black sea bass. Both instances may lead to the potential for more numerous sampling locations with fewer fish from each location. Finally, the maximum target of 25,200 black sea bass would only be achievable if all Research Fleet participants operated year-round. Since many of the gear types represented within the Research Fleet stop fishing for the winter months, the realized sampling numbers are lower.

At each sampling location, participant fishermen will use On Deck Data to record the date, time, location, statistical area, depth, habitat type, target species, gear type, effort deployed (see Table 1), total number or pounds of black sea bass retained and discarded, and length, sex, and disposition of at least 50 black sea bass. Sampling date, time, and location will be automatically recorded by the internal tablet GPS. Standardized fish measuring boards will be used across the Research Fleet to ensure a consistent measure of fish length to the nearest centimeter. Data will be wirelessly uploaded to a MySQL database once a vessel returns to port and continually monitored by the project team. This data communication, review, management, and storage process was established and vetted during the first year of the project and has been implemented in each year since.

Scientific collector's permits, issued by RI DEM, will be obtained for vessels fishing within Rhode Island state waters to allow for black sea bass collection for laboratory sampling. These permits were successfully acquired multiple times during the first funding years of the project and will be extended through subsequent years of data collection and expanded to cover new Research Fleet participants. During the 2020 sampling year, it was decided to no longer obtain an Exempted Fishing Permit for Research Fleet sampling. The exemptions allowed for recreational retention regardless of closure periods and exempted commercial rod and reel and charter vessels from minimum size limits for sampling purposes. Neither of these exemptions were necessary for Research Fleet operation as no black sea bass are retained for laboratory sampling from federal waters. They also allowed for participants to keep undersized fish onboard longer than the time needed for sampling.

The project team recently published a manuscript in *Frontiers in Marine Science* detailing the data collection methods of the Research Fleet. This manuscript, titled "Mobilizing the fishing industry to address data gaps created by shifting species distribution" also evaluates the sampling frequencies of the Research Fleet and demonstrates the value of the Research Fleet approach to quickly and cost efficiently collect large amounts of data on marine finfish species. The full paper can be found at

<https://www.frontiersin.org/articles/10.3389/fmars.2023.1043676/full>

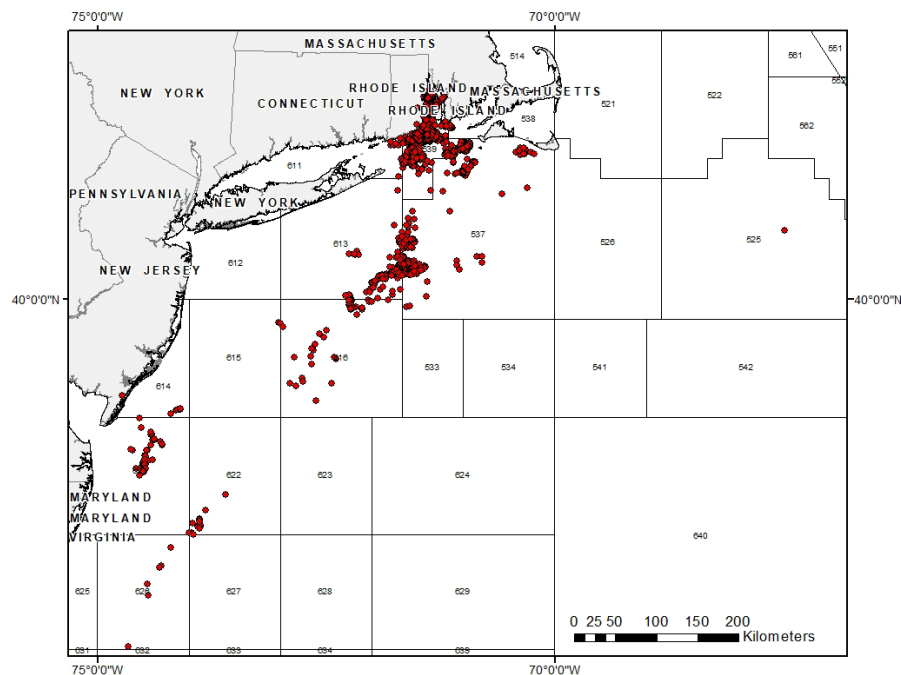
#### *Internal Data Analysis:*

As described above, the Black Sea Bass Research Fleet was able to operate effectively and deliver data in an efficient manner during the first six+ years of data collection, sampling over 53,109 black sea bass from 2,866 sampling sessions conducted from coastal Rhode Island into

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ACCSP Funding Proposal (Maintenance Project – Project Year 8, Maintenance Year 6): Fishery Dependent Sampling for Black Sea Bass  
(*Centropristis striata*)

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the MAB and east to George's Bank from November 30, 2016 to May 1, 2023 (Figure 1). In total, the Black Sea Bass Research Fleet has sampled black sea bass from 13 distinct statistical areas: 525, 537, 538, 539, 611, 613, 614, 615, 616, 621, 622, 626, and 627. The majority of samples have originated from statistical areas 537 and 539, which are closest to Rhode Island, however, samples have been collected from statistical areas down into the Mid-Atlantic (621, 622, 626, 627) as well.



*Figure 1. Black Sea Bass Research Fleet sampling locations (red circles) and associated statistical areas in the Southern New England and Mid-Atlantic region of the United States East Coast.*

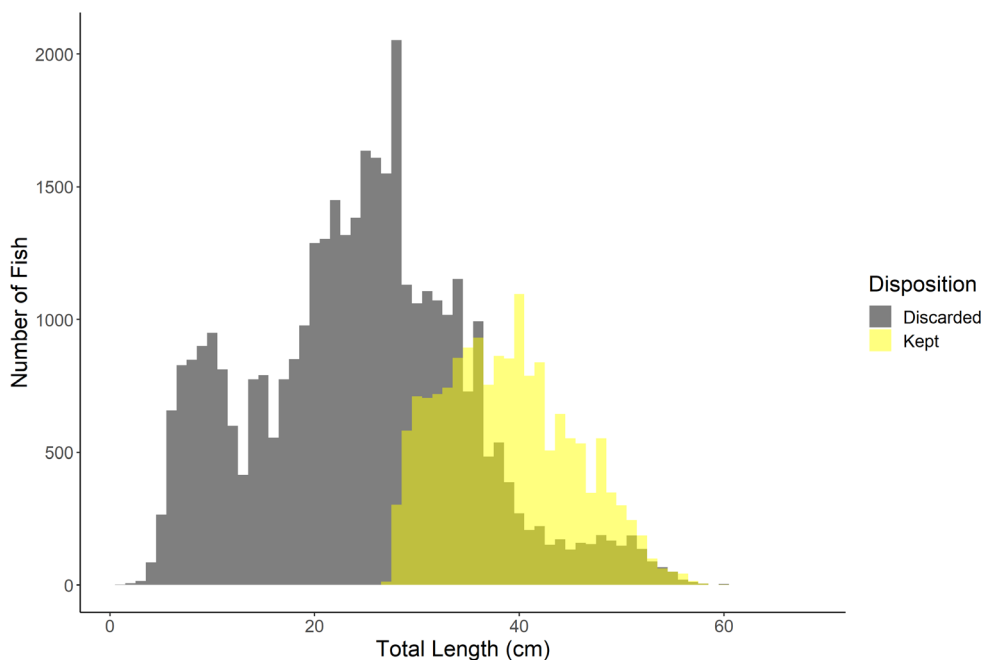
Biological data are summarized in Table 2. The ultimate application of these data is the black sea bass stock assessment. To achieve this goal, the project team has worked directly with steering committee members and black sea bass stock assessment scientists since the beginning of the project to ensure that Research Fleet data is of the necessary quality and structure for utilization in the stock assessment. In 2022, the project team regularly participated in meetings with the Black Sea Bass Research Track Stock Assessment Working Group to discuss the Research Fleet data, provide data summaries, and answer questions about the dataset. Throughout this process, the Working Group evaluated how this data could be incorporated in black sea bass assessment models and voted to include the Research Fleet's gear-specific length and disposition data in the 2022 assessment (scheduled to be published in late 2023). Communication with the Working Group will continue and will focus on incorporating additional data, such as catch and effort data collected by the Research Fleet, into future stock assessments.

*Table 2. Summary of data collected by the Black Sea Bass Research Fleet as of May 1, 2023.*

Total Black Sea Bass Sampled	53,109
Percent Male	25%
Percent Female	37%
Percent Unknown	38%
Minimum Size (cm)	1
Maximum Size (cm)	68
Average Size (cm)	28.8
Percent Discarded	70%
Percent Retained	30%

In addition to the application of biological black sea bass data to the stock assessment, the data derived from the Black Sea Bass Research Fleet could also be used to characterize the catch, bycatch, and other characteristics of black sea bass in the SNE/MAB region, including gear selectivity and spatiotemporal patterns in catch composition. An additional 12 months of sampling by the Research Fleet will provide a better understanding of these seasonal and spatial dynamics as the data will now become the first multi-gear, multi-year, time series for the species.

The data collected during the previous funding years of the project exhibit interesting biological and fishery trends that will continue to be monitored in subsequent years of sampling for the proposed project. As expected, the average length of retained fish (38.9 cm) is larger than that of discarded fish (24.5 cm). However, the high frequency of legal-sized (>27.94 cm) discarded black sea bass caught by commercial gear suggests black sea bass are primarily being discarded due to seasonal closures and/or low daily limits, rather than the minimum size limit. For example, 37% of all commercially discarded fish have been legal size. The range of lengths of discarded fish further supports this, showing that even the largest of sampled black sea bass (receiving the highest market value) are often discarded (Figure 2).



*Figure 2. Size spectra of black sea bass sampled by the Research Fleet from November 30, 2016 to May 1, 2023.*

When comparing gear selectivity between the different gear types represented within the Research Fleet, trends between discarded and retained black sea bass are apparent (Figures 3 and 4). Trawl gear regularly interacts with the largest size range of black sea bass of all the gear types represented. Rod and reel (commercial and charter), fish pot, and lobster pot all exhibited nearly as wide a range of size interaction with black sea bass as trawl gear types, however, did not interact with the smallest of size classes of black sea bass as frequently and therefore had higher mean total length. Gillnet appears to be in a distinct grouping of its own and exhibits the highest selectivity amongst all represented target gear types, as this gear exclusively interacts with the largest size classes of black sea bass. The “other” gear category primarily represents conch pots and oyster aquaculture gear; these gear types are similarly selective compared to gillnet gear however interact primarily with the smallest size classes of black sea bass. Interestingly, black sea bass of legal size (>27.94 cm) are still sometimes captured in conch pots and have been retained for sale during sampling events.

These trends, which have become apparent from just the first several funding years of sampling, suggest there is gear-specific size selectivity occurring in the black sea bass fisheries in the SNE/MAB regions. The proposed project will continue to track these trends as the time series builds with subsequent years of sampling. This type of information could have important ramifications to the stock assessment as it could help inform the selection of fleets modeled within the assessment.

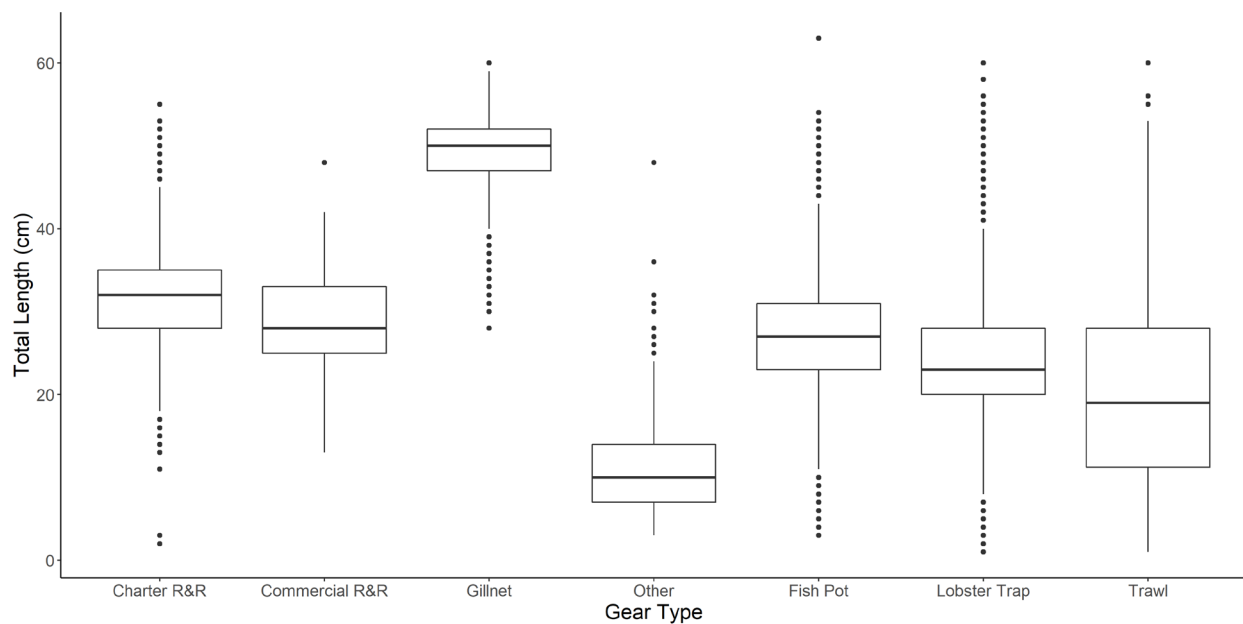


Figure 3. Size range of discarded black sea bass sampled by each gear type represented within the research fleet as of May 1, 2023.

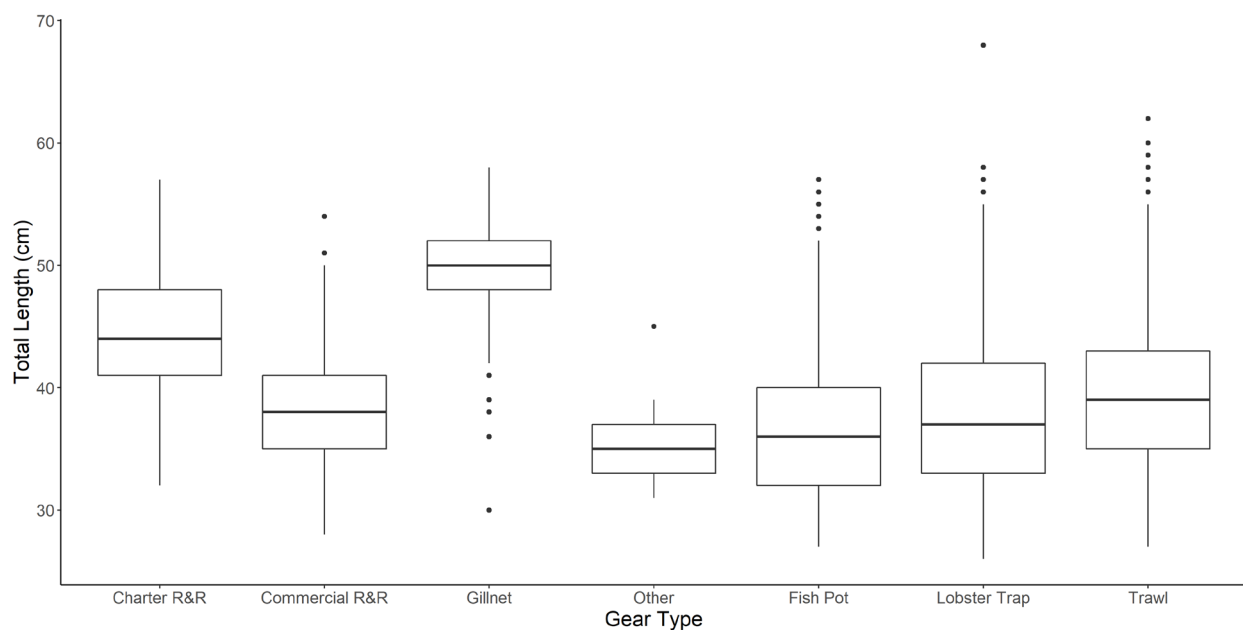


Figure 4. Size range of retained black sea bass sampled by each gear type represented within the research fleet as of May 1, 2023.

During the proposed year of the project, the project team will focus on the refinement and expansion of analyses previously established for application to the stock assessment including: length distributions, sex ratios, catch per unit effort (CPUE), black sea bass retention and discard structure, seasonal activity of Research Fleet, and gear selectivity. Specifically, internal data analysis questions proposed during the past funded year of the project were: 1) Are there spatial (latitudinal) patterns in the length frequency or sex ratio of black sea bass?, 2) Are there seasonal differences in black sea bass catch composition (length frequency and sex ratio)?, 3) Are different life stages of black sea bass apparent in commercial fisheries catch in specific areas or at different times of year?, and 4) What is the selectivity (min, max, mean length) of different gear types (trawl, fish pots, gillnet, lobster/crab pot, rod and reel) that harvest black sea bass? Year-8 analyses will build upon the initial results from exploration of these questions and will begin to explore temporal trends in the dataset. The project team will aim to publish a manuscript containing results from internal analyses in a peer-reviewed journal as time allows. The establishment of gear type selectivity curve models comparing different gear types as well as multiple years of Research Fleet data may serve as a potential input to the next black sea bass stock assessment as well.

The open-source statistical software package R will be used for data analysis. Length frequencies, black sea bass length gear selectivity, spatial and seasonal sex ratio regression models, and catch rate patterns will all be updated based on the protocols established in prior years of the project to further analyze seasonal trends as well as compare data from year to year. Data and code will be made available to others upon reasonable request.

In addition to further addressing the aforementioned research questions, the project team will also explore novel fishery dependent indices for the black sea bass stock assessment, as time permits.

### *Outreach and Education*

Education, outreach, and ongoing communication are an integral part of the overall work plan for the proposed project. These components of the proposed project support the goal of fostering collaborative working partnerships among scientists, managers, and members of the fishing industry through all phases of research, from the fine-tuning of sampling strategies through the analysis and sharing of data and results.

The primary outreach/education goal of the proposed project is to share and disseminate information on two topics: 1) the lessons learned from the collaborative Research Fleet approach for fishery dependent data collection; and 2) the findings from analysis of the black sea bass catch, bycatch, and biological databases derived from this project.

A secondary goal is to share and disseminate project information to a variety of interest groups including: 1) commercial fishing industry members; 2) fisheries scientists and managers based in various state, regional, and federal agencies; 3) outside researchers who will utilize this information to inform their own research efforts in the region; and 4) other interested parties



seeking information on new data collection/ocean monitoring techniques and approaches, and/or trends in black sea bass abundance and distribution in the SNE/MAB region.

There are several work elements embedded in the project work plan that are aimed at specifically addressing outreach and education goals, including:

1. Ongoing communication with project team members, including the members of the Black Sea Bass Research Fleet through personal meetings, group meetings, e-mail briefings, and phone conversations.
2. Periodic project briefings to key individuals outside the project team, including ASMFC, MAFMC, NMFS NEFSC, and NMFS GARFO staff, members of the black sea bass fishing fleet, and interested others through direct e-mail/mail correspondence, including periodic newsletters describing the project progress. The CFRF newsletters are sent to over 1700 addresses.
3. Regular postings of project information on the CFRF website, including descriptions of the fishermen involved, the equipment being used, the type of data being collected, and findings, as this information becomes available over the course of the project ([www.cfrfoundation.org/black-sea-bass-research-fleet](http://www.cfrfoundation.org/black-sea-bass-research-fleet)). The CFRF also posts periodic updates on this project on the CFRF Facebook page, which has over 1800 followers.
4. Participation in scientific, public, and industry-based conferences. So far, these include:
  - a. 2017
    - i. Massachusetts Lobsterman's Association (MLA) Annual Trade Show (Booth)
    - ii. New Bedford Working Waterfront Festival (Booth)
    - iii. Coastal and Estuarine Research Federation Conference (Booth)
  - b. 2018
    - i. Southern New England Chapter (SNEC) of the American Fisheries Society (AFS) (Poster presentation. *"Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region using Modern Technology and a Fishing Vessel Fleet Approach"*. Thomas Heimann, Anna Malek Mercer, and Jason McNamee)
    - ii. MLA (Seminar)
    - iii. AFS (Presentation. *"Advancing Fishery Dependent Data Collection for Black Sea Bass (*Centropristis striata*) in the Southern New England and Mid-Atlantic Region using Modern Technology and a Fishing Vessel Fleet Approach"*. Anna Malek Mercer, Thomas Heimann, and Jason McNamee)
  - c. 2019
    - i. SNEC AFS (Presentation. *"Using Fishermen-Collected Data to Explore the Black Sea Bass (*Centropristis striata*) Population and Construct Gear-Specific Discard Characterizations"*. Anna Malek Mercer, Thomas Heimann, and Jason McNamee)
    - ii. MLA (Booth and Seminar)

- iii. Maine Fishermen’s Forum (Booth and Presentation. *“Warming Waters, Emerging Species, and Market Changes: Lessons Learned from Southern New England”*. Anna Malek Mercer, Aubrey Ellertson, and Thomas Heimann)
    - iv. Wakefield Fisheries Symposium (Presentation. *“Using Industry Collaboration to Improve Black Sea Bass Management”*. Anna Malek Mercer, Thomas Heimann, and Jason McNamee)
    - v. Senator Sheldon Whitehouse’s 10th Annual Oceans, Energy, and Environmental Leaders Day (Poster Presentation. *“Advancing Fishery Dependent Data Collection for Black Sea Bass (Centropristis striata) in the Southern New England and Mid-Atlantic Region using Modern Technology and a Fishing Vessel Fleet Approach”*. Thomas Heimann, Anna Malek Mercer, and Jason McNamee)
    - vi. Gulf of Maine 2050 symposium (Lightning Talk. *“Warming Waters Create Opportunity for Diversification and Collaboration: Addressing the Rise of Black Sea Bass in Southern New England”*. Thomas Heimann, Christopher Glass, and Jason McNamee)
  - d. 2020
    - i. New England Cooperative Research Summit. *“Filling the Gap with Self-Reported Data: Research Fleets”*. N. David Bethoney and Fred Mattera
  - e. 2021
    - i. American Fisheries Society (Two Presentations. 1. *“Using a fishery-dependent research fleet approach to characterize the composition of black sea bass (Centropristis striata) discards in the Southern New England and Mid-Atlantic fishery”*. Hannah Verkamp, Thomas Heimann, Jason McNamee, and N. David Bethoney. 2. *“The Commercial Fisheries Research Foundation Research Fleets: Progress and New Directions”*. N. David Bethoney, Aubrey Ellertson, and Thomas Heimann)
  - f. 2022
    - i. International Council for the Exploration of the Sea Annual Science Conference. *“Multiple pathways with common roots for integration of fisher experiential knowledge into marine science and management”*. N. David Bethoney.
- 5. Publication of project methods and results in peer-reviewed scientific journals. So far, this has included:
  - a. *“Mobilizing the fishing industry to address data gaps created by shifting species distribution”* by Heimann, T., H. Verkamp, J. McNamee, and N.D. Bethoney. 2023. *Frontiers in Marine Science* 10.  
<https://doi.org/10.3389/fmars.2023.1043676>
- 6. Sharing of relevant data and samples to aid other regional research initiatives centered on black sea bass. So far, this has included:

- a. Facilitated the collection of 30 live black sea bass for laboratory observation of black sea bass predation on lobster by a Master's student in Dr. Candace Oviatt's lab at University of Rhode Island
  - b. Contributed over 150 black sea bass samples to Dr. Jonathan Grabowski at Northeastern University since 2019 to investigate differences among black sea bass across three distinct geographic zones in the northern range of black sea bass.
  - c. Contributed 30 black sea bass samples to Dr. Kelton McMahon at the University of Rhode Island in 2019 to investigate stable isotope concentrations and trophic overlap with cod.
  - d. Contributed length, sex, disposition, date, time, and location data from recreational fishing trips by a Research Fleet member to Mr. Chris McGuire of the Nature Conservancy in 2019 to validate the organizations camera-based data collection system.
  - e. Contributed 100 black sea bass samples to Dr. Katie Lotterhos at Northeastern University in 2021 to sequence the black sea bass genome and evaluate population structure.
  - f. Contributed aging structures from over 2,400 black sea bass for inclusion in the Virginia Institute of Marine Science's black sea bass aging database.
  - g. Contributed 69 otoliths to scientists at Massachusetts Division of Marine Fisheries for inclusion in a study that validated ageing methods for black sea bass and compared results across different regions. This work was recently published: Koob ER, SP Elzey, JW Mandelman, MP Armstrong. 2021. "Age validation of the northern stock of black sea bass (*Centropristis striata*) in the Atlantic Ocean. Fish Bull. 119: 261-271 DOI: 10.7755/FB.119.4.6
  - h. Contributed relevant data to a Masters student at the University of Massachusetts Dartmouth School of Marine Science and Technology studying the effects of windfarm development on black sea bass.
7. Organization of a research session at the end of the project involving managers, scientists, and members of the commercial and recreational fishing industries to share project findings and discuss experiences and results.
  8. Issuance and distribution of a written summary report.

### **Geographic Location:**

At-sea sampling will be conducted within the northern Atlantic black sea bass stock area (SNE/MAB region), potentially including statistical areas 521 to 631. The final distribution of at-sea data collection will depend on the fishing locations selected by participant fishermen. Project administration, and data management and analyses will be conducted at the Commercial Fisheries Research Foundation office in Kingston, Rhode Island and the RI DEM marine laboratory in Jamestown, Rhode Island.

## Milestone Schedule:

Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13-15
Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Research Fleet data collection and Fleet support	Final report writing and submission of report and all project data to ACCSP
				Apply for RI DEM Permits	Distribute RI DEM Permits to Fleet							
Maintain sampling gear and buy new sets	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear	Maintain sampling gear & collect after sampling	
Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	Maintain ODD, server, and database	
Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	Data QA/QC, review, and analysis	
		Quarterly reports to Fleet Members			Quarterly reports to Fleet Members			Quarterly reports to Fleet Members			Quarterly reports to Fleet Members	
				Submit data to ACCSP		Write progress report and submit to ACCSP				Submit data to ACCSP		
Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	Maintain project website and project outreach	

## Project History Table:

<u>Funding Year</u>	<u>Title</u>	<u>Original Project Dates</u>	<u>Funded Amount</u>	<u>Total Project Cost</u>	<u>Description</u>
2016 New	Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	September 1, 2016 – August 31, 2018	\$137,827.00	\$203,072.00	Piloted the research fleet technique for collection of fishery dependent catch, effort, bycatch, and biological data in the multi-gear black sea bass fishery
2018 New	Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	May 1, 2018 – May 31, 2019	\$135,648.00	\$187,949.00	Maintained the research fleet fishery dependent data collection of catch, effort, bycatch, and biological data in black sea bass fishery and expanded Research Fleet by two fishing vessels
2019 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	June 1, 2019 – May 31, 2020	\$132,749.00	\$169,033.00	Maintained the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region and expanded the Research Fleet by two fishing vessels
2020 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	August 1, 2020 – July 31, 2021	\$132,097.00	\$157,735.00	Maintained the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region and expanded the Research Fleet by one fishing vessel
2021 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	August 1, 2021 – July 31, 2022	\$132,064.00	\$154,537.00	Maintained the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region and expanded the Research Fleet by two fishing vessels
2022 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	August 1, 2022 – July 31, 2023	\$132,005.00	\$154,478.00	Maintained the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region
2023 Maintenance	Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach	August 1, 2023 – July 31, 2024	\$88,152	\$109,640	Will maintain the Research Fleet data collection of catch, effort, bycatch, and biological data in the black sea bass fishery in the SNE/MAB region

### Project Accomplishments Measurement (Metrics and *Achieved Goals*):

Project Goal	Metric 1	Metric 2	Metric 3	Metric 4	Metric 5	Metric 6	Metric 7
<b>Collection &amp; communication of biological and fishery data for BSB</b>	Upkeep of ODD, CFRF server, and MySQL database  <i>Achieved in Years 1-6 + In progress Year 7</i>	Support of 14 Research Fleet Members  <i>Achieved in Years 1-6 + In progress Year 7</i>	Twelve months of biological BSB and fishery data collection by Fleet  <i>Achieved in Years 1-6 + In progress Year 7</i>	Collection of up to 27,000 BSB records, 540 record of catch/discards, and 540 session/effort data by Research Fleet  <i>Achieved in Years 1-6 + In progress Year 7</i>	Transfer of collected data into MySQL database  <i>Achieved in Years 1-6 + In progress Year 7</i>	Distribution of quarterly reports to Fleet Members  <i>Achieved in Years 1-6 + In progress Year 7</i>	Submission of biological and fishery data to ACCSP and other managers  <i>Achieved in Years 1-6 + In progress Year 7</i>
<b>Reduce uncertainties in BSB stock assessment</b>	Increase number of gear replicates in non-trawl fishery  <i>Achieved in Years 2-4</i>	Provide BSB data from areas and times of year currently under sampled  <i>Achieved in Years 1-6 + In progress Year 7</i>	Distribution of project data to managing stakeholders at federal, region, and local level  <i>Achieved in Years 1-6 + In progress Year 7</i>	Utilization of data by BSB stock assessment working group  <i>In progress</i>	Explore fishery dependent index of abundance for BSB using Fleet data  <i>In progress</i>		
<b>Assess spatial &amp; temporal patterns in BSB fishery and catch</b>	Analyze catch trends between years, gear types, and locations of Fleet sampling  <i>Achieved in Years 1-6 + In progress Year 7</i>	Monitor discard structure between years within Fleet sampling  <i>Achieved in Years 1-6 + In progress Year 7</i>	Monitor size and sex structure of retained BSB between sampling years  <i>Achieved in Years 1-6 + In progress Year 7</i>	Monitor trends in length frequencies within gear types, locations and times of year  <i>Achieved in Years 1-6 + In progress Year 7</i>	Add additional years of data to explore inter annual differences in length frequency  <i>Achieved in Years 1-6 + In progress Year 7</i>	Update of BSB sex ratio logistic regression models from prior years  <i>Achieved in Years 1-6 + In progress Year 7</i>	Develop manuscript for publication utilizing biological or fishery data from Fleet  <i>In progress</i>
<b>Demonstrate model approach for cost efficient fishery dependent data collection</b>	Usage of collaborative approach established in previous years  <i>Achieved in Years 1-6 + In progress Year 7</i>	Presentations of Fleet design at scientific conferences  <i>Achieved in Years 1-6 + In progress Year 7</i>	Develop manuscript to validate Fleet design through peer review  <i>Achieved in Year 6</i>				

### **Cost Summary and Funding Transition Plan:**

This proposal represents two thirds cost reduction from the original proposal of a similar scope to comply with the ACCSP funding schedule. The drop is met primarily by a reduction in vessel stipends and CFRF personnel costs. The vessel stipend reduction is based on returning the Research Fleet to its original proposed size of eight vessels. A few years ago, based on input from stock assessment scientists, the Research Fleet was expanded to obtain more samples from the pot fishery, which had been traditionally under sampled by other sources. Following this precedent, project staff will consult with the black sea bass stock assessment Working Group before reducing the number of Research Fleet vessels and will prioritize keeping vessels of gear types for which samples are most useful. This reduction, as well as staff experience in running the Research Fleet, merits further reduction of executive director, research staff, and business manager time. Reductions to the supply budgets were also made to reflect vessel reduction and the reuse of older supplies. These changes are reflected in the CFRF sub-contract (section F of the Budget Table).

The CFRF and RI DEM have pursued funding from a variety of sources for the Black Sea Bass Research Fleet and will continue to do so to ensure the longevity and utility of the data collected to the management of this data poor species. In previous funding years, the CFRF has been successful in securing partial funding from the Sarah K. de Coizart Tenth Perpetual Charitable Trust to support the Research Fleet. This year, the CFRF submitted a fiscal year 2024 Congressionally Directed Spending request to Senator Sheldon Whitehouse to support the Black Sea Bass Research Fleet for up to five years. That request was put forward to the Senate Appropriations Committee for consideration. The CFRF and RI DEM will continue to look for outside sources of funding to support the Research Fleet and the valuable work it produces into the future.

### ***Budget Table:***

TOTAL	Proposal	In-Kind	Total
	\$ 43,635	\$ 19,707	\$ 63,342
% Contribution by Funding Source	69%	31%	100%
Object Class Category	Proposal	In-Kind	Total
A Personnel			
- RI DEM - Jason McNamee		\$ 5,347	\$ 5,347
- RI DEM - Contractor		\$ 4,547	\$ 4,547
- RI Dem - Intern		\$ 2,500	\$ 2,500
Total RI DEM Personnel Costs	\$ -	\$ 12,394	\$ 12,394
B Fringe Benefits	\$ -	\$ 4,214	\$ 4,214
C Travel	\$ -	\$ -	\$ -
D Equipment	\$ -	\$ -	\$ -
E Supplies	\$ -	\$ -	\$ -
F Contractual - CFRF			
a. Personnel			
- Executive Director - David Bethoney	\$ 1,400		\$ 1,400
- Research Biologists	\$ 9,000		\$ 9,000
- Business Manager	\$ 503		\$ 503
Total CFRF Personnel Costs	\$ 10,903	\$ -	\$ 10,903
b. Fringe Benefits	\$ 1,090	\$ -	\$ 1,090
c. Travel	\$ 500	\$ -	\$ 500
d. Equipment	\$ -	\$ -	\$ -
e. Supplies			
- Research Supplies	\$ 340		\$ 340
- Office Supplies	\$ 50		\$ 50
Total Supplies	\$ 390	\$ -	\$ 390
f. Contractual			
- Programmer for On-Deck Data database	\$ 250	\$ -	\$ 250
Total Contractual	\$ 250	\$ -	\$ 250
g. Construction	\$ -	\$ -	\$ -
h. Other Costs			
- Fishing Vessel Stipends	\$ 23,040	\$ -	\$ 23,040
- Executive Assistance	\$ -	\$ -	\$ -
Total Other Costs	\$ 23,040	\$ -	\$ 23,040
i. Total Direct Charges	\$ 36,173	\$ -	\$ 36,173
j. Indirect Charges			
- Proposed at 20.63% of CFRF Direct Charges	\$ 7,462	\$ -	\$ 7,462
Total Indirect Charges	\$ 7,462	\$ -	\$ 7,462
k. Total CFRF Costs	\$ 43,635	\$ -	\$ 43,635
G Construction	\$ -	\$ -	\$ -
H Other Costs	\$ -	\$ -	\$ -
I Total Direct Costs	\$ 43,635	\$ 16,608	\$ 60,243
J Indirect Charges	\$ -	\$ 3,099	\$ 3,099
K Total Proposal Costs	\$ 43,635	\$ 19,707	\$ 63,342

Rhode Island Department of Environmental Management & Commercial Fisheries Research Foundation  
ACCSP Funding Proposal (Maintenance Project – Project Year 8, Maintenance Year 6): Fishery Dependent Sampling for Black Sea Bass  
(*Centropristis striata*)

Proposal components that address the ranking criteria are underlined and a summary is provided on pages 30-33.



**Budget Justification – Year 8 (Maintenance Year 6 Project, Proposed):**

The total proposed federal budget requested by the Rhode Island Department of Environmental Management (RI DEM) and the Commercial Fisheries Research Foundation (CFRF) for all components of the work is \$43,635 for 12 months. The voluntary non-federal match funds provided by the RI DEM and CFRF is \$19,707. The total proposal value is \$63,342. The proposed timeframe is August 1, 2024 to July 31, 2025. The proposed budget justification for object class category items includes the following:

Personnel: \$12,394 In-Kind (RI DEM). RI DEM staff will play an advisory/support role in the proposed project, providing guidance on research protocols, assisting with statistical analyses as needed, exploring gear-specific indices of abundance and alternative modeling approaches as time permits, support in the procurement and storage of samples, and communicating project results to fishery governance system via existing participation in technical committees and working groups.

Fringe Benefits: \$4,214 In-Kind (RI DEM). Fringe costs are charged on RI DEM FTEs only.

RIDEM Annual Fringe benefit rates are:

Retirement 24%	Deferred Compensation 0.4%
FICA 6.2%	Medicare 1.45%
Health care \$21,937/year	Dental \$1,132/year
Vision Mercer \$165/year	Assessed Fringe 4.25%
Retiree Health 6.75%	

Travel: There are no direct travel charges.

Equipment: There are no direct equipment charges.

Supplies: There are no direct supplies charges.

Contractual: The CFRF will conduct most of the work involved in this project, with administrative and technical assistance provided by RI DEM as In-Kind. These services will be charged to the grant as contractual costs and are outlined below to provide more detail as to how the funding will be used:

Personnel: \$10,904 federal. This includes the wages for the following CFRF personnel for time spent working directly on the project:

1. Executive Director – Proposed at 1% of time for 12 months = \$1,400. D. Bethoney, CFRF Executive Director, will oversee the administration, team communication/coordination, and outreach aspects of the project. He will also assist with data analysis, report and outreach material development, and communication of project progress to the client, fishing industry and management communities.
2. Research Scientist – Proposed at 15% of time for 12 months = \$9,000. H. Verkamp, CFRF Research Biologist, will be the primary individual responsible for fleet organization,

Rhode Island Department of Environmental Management & Commercial Fisheries Research Foundation

ACCSP Funding Proposal (Maintenance Project – Project Year 8, Maintenance Year 6): Fishery Dependent Sampling for Black Sea Bass

(*Centropristis striata*)

Proposal components that address the ranking criteria are underlined and a summary is provided on pages 30-33.

maintenance, and support, as well as data management, communication, and analysis. She will also support the Executive Director in project oversight tasks.

3. Business Manager – Proposed at 1% of time for 12 months = \$503. T. Winneg, CFRF Business Manager, will carry out all the finance related aspects of the project including research budget tracking, invoice processing, and administrative support tasks, including purchasing supplies.

Fringe Benefits: \$1,091 federal. This includes a percentage for payroll taxes and worker's compensation insurance prorated in accordance with % of salary paid from program. Benefits proposed at 10% of personnel costs based on 2022 benefits and historical analysis.

Travel: \$500 federal. Travel costs include travel support (mileage) for project staff to provide support at docks to Research Fleet participants, to participate in meetings with the Research Fleet, stock assessment scientists, and managers. The advent of remote participation may allow for dissemination of project methods, findings, and conclusions at an industry/professional conference.

Equipment: \$0. There will be no equipment costs on this project.

Supplies: \$390 federal. This category includes research supplies and project office supplies.

1. Research Supplies: \$340 - Costs of tablets, waterproof cases, stylus & fish measuring board. The proposed cost is for replacements of research fleet vessel supplies that are damaged or lost.

2. Office Supplies: \$50 – Costs to cover database storage and website fees project office and meeting supplies, etc.

Contractual: \$250 federal. This includes costs associated with a Programmer (\$250 - federal) - CFRF hires an outside computer programmer to maintain the OnDeckData application and database coding for data relay and storage, to address any issues that arise, and to update the app to maintain functionality.

Construction: There are no construction costs.

Other Costs: \$23,040 federal. This includes:

Fishing vessel stipends (\$23,040 - federal) for 8 vessels for 12 months at \$600 per month. A fleet of 8 vessels will be utilized each month to obtain the proposed biological samples. The total stipend is computed at 40% due to fluctuations in vessel sampling associated with weather, vessel maintenance, and seasonal black sea bass distribution.

Total Direct Charges: \$36,173 federal. This is the total direct charges for cost items a-h.

Indirect Charges: \$7,462 federal. Indirect general and administrative costs are calculated as 20.63% of Total Direct Charges. Indirect general and administrative costs are used to cover costs associated with the general operations of the CFRF including accounting services, legal services, maintenance of office space, liability insurance, payroll fees, phone/fax lines, internet service, etc. The CFRF's FY2023 Indirect Cost Rate Authorization Letter dated 4/6/2023 is for 20.63% based on FY2022 actual costs.

Total Proposal Costs: \$43,635 Federal Total.

Construction. There are no construction costs on this grant

Other Costs. There are no other costs associated with this grant.

Total Direct Charges: \$88,152 Federal + \$21,254 In-Kind = \$109,406 total. This is the total direct charges for cost items A-H.

Indirect Charges: \$3,099 In-Kind (RIDEM). Indirect charges are charged on RIDEM Salaries only. The Negotiated Indirect Cost Rate for FY2017 is 25%. (Total personnel is \$12,394 x 25% = \$3,099.)

Total Proposal Costs: \$88,152 Federal + \$21,488 In-Kind = \$109,640 Total.

***Previous Year's Budget Narrative – Year 7 (Maintenance Year 5 Project, Funded FY23):***

The total proposed federal budget requested by the Rhode Island Department of Environmental Management (RI DEM) and the Commercial Fisheries Research Foundation (CFRF) for all components of the work is \$88,152 for 12 months. The voluntary non-federal match funds provided by the RI DEM and CFRF is \$21,488. The total proposal value is \$109,640. The proposed timeframe is August 1, 2023 to July 31, 2024. The proposed budget justification for object class category items includes the following:

Personnel: \$12,394 In-Kind (RI DEM). RI DEM staff will play an advisory/support role in the proposed project, providing guidance on research protocols, assisting with statistical analyses as needed, exploring gear-specific indices of abundance and alternative modeling approaches as time permits, support in the procurement and storage of samples, and communicating project results to fishery governance system via existing participation in technical committees and working groups.

Fringe Benefits: \$4,214 In-Kind (RI DEM). Fringe costs are charged on RI DEM FTEs only.

RIDEM Annual Fringe benefit rates are:

Retirement 24%

Deferred Compensation 0.4%

FICA 6.2%

Medicare 1.45%

Health care \$21,937/year  
Vision Mercer \$165/year  
Retiree Health 6.75%

Dental \$1,132/year  
Assessed Fringe 4.25%

Travel: There are no direct travel charges.

Equipment: There are no direct equipment charges.

Supplies: There are no direct supplies charges.

Contractual: The CFRF will conduct most of the work involved in this project, with administrative and technical assistance provided by RI DEM as In-Kind. These services will be charged to the grant as contractual costs and are outlined below to provide more detail as to how the funding will be used:

Personnel: \$24,543 federal. This includes the wages for the following CFRF personnel for time spent working directly on the project:

1. Executive Director – Proposed at 2.5% of time for 12 months = \$3,176. D. Bethoney, CFRF Executive Director, will oversee the administration, team communication/coordination, and outreach aspects of the project. He will also assist with data analysis, report and outreach material development, and communication of project progress to the client, fishing industry and management communities.
2. Research Scientist – Proposed at 35% of time for 12 months = \$20,108. T. Heimann and another CFRF Research Biologists will be the primary individuals responsible for fleet organization, maintenance, and support, as well as data management, communication, and analysis. They will also support the Executive Director in project oversight tasks.
3. Business Manager – Proposed at 2.5% of time for 12 months = \$1,259. T. Winneg, CFRF Business Manager, will carry out all the finance related aspects of the project including research budget tracking, invoice processing, and administrative support tasks, including purchasing supplies.

Fringe Benefits: \$2,455 federal. This includes a percentage for payroll taxes and worker's compensation insurance prorated in accordance with % of salary paid from program. Benefits proposed at 10% of personnel costs based on 2021 benefits and historical analysis.

Travel: \$500 federal. Travel costs include travel support (mileage) for project staff to provide support at docks to Research Fleet participants, to participate in meetings with the Research Fleet, stock assessment scientists, and managers. The advent of remote participation may allow for dissemination of project methods, findings, and conclusions at an industry/professional conference.

Equipment: \$0. There will be no equipment costs on this project.

Supplies: \$1,150 federal. This category includes research supplies and project office supplies.

1. Research Supplies: \$500 - Costs of tablets, waterproof cases, stylus & fish measuring board. Proposed at \$500 per set x 1 vessels for the duration of the project. The set of sampling equipment for existing Research Fleet vessels are replacements for equipment that is damaged or lost.
2. Office Supplies: \$650 – Costs to cover database storage and website fees (\$50/month), project office and meeting supplies, etc.

Contractual: \$250 federal. This includes costs associated with:

Programmer (\$250 - federal) - CFRF hires an outside computer programmer to maintain the OnDeckData application and database coding for data relay and storage, to address any issues that arise, and to update the app to maintain functionality.

Construction: There are no construction costs.

Other Costs: \$45,360 federal + \$1,500 match = \$46,860. This includes:

Fishing vessel stipends (\$45,360 - federal) for 14 vessels for 12 months at \$600 per month. A fleet of 14 vessels will be utilized each month to obtain the proposed biological samples. The total stipend is computed at 45% due to fluctuations in vessel sampling associated with weather, vessel maintenance, and seasonal black sea bass distribution.

Executive Assistance (\$1,500 - in-kind match) covers the administration assistance for the project (including, review of fleet applications and invoices) by the CFRF President and Vice President, who provide these services at no cost. Costs proposed at \$250 per day for 3 days for 2 people over the duration of the project.

Total Direct Charges: \$74,258 federal + \$1,500 in-kind = \$75,758 total. This is the total direct charges for cost items a-h.

Indirect Charges: \$13,894 federal + \$281 in-kind = \$14,175 total. Indirect general and administrative costs are calculated as 18.71% of Total Direct Charges. Indirect general and administrative costs are used to cover costs associated with the general operations of the CFRF including accounting services, legal services, maintenance of office space, liability insurance, payroll fees, phone/fax lines, internet service, etc. The CFRF's FY2022 Indirect Cost Rate Authorization Letter dated 2/11/22 is for 18.71% based on FY2021 actual costs.

Total Proposal Costs: \$88,152 Federal + \$1,781 In-Kind = \$89,933 Total.

Construction. There are no construction costs on this grant

Other Costs. There are no other costs associated with this grant.

Total Direct Charges: \$88,152 Federal + \$21,254 In-Kind = \$109,406 total. This is the total direct charges for cost items A-H.

Indirect Charges: \$3,099 In-Kind (RIDEM). Indirect charges are charged on RIDEM Salaries only. The Negotiated Indirect Cost Rate for FY2017 is 25%. (Total personnel is \$12,394 x 25% = \$3,099.)

Total Proposal Costs: \$88,152 Federal + \$21,488 In-Kind = \$109,640 Total.

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## **Summary of Proposal for Ranking Purposes**

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**Type:** Maintenance

### **Primary Program Priorities:**

This project follows fishery-dependent sampling protocols to collect black sea bass catch and effort, biological, and bycatch data from the SNE/MAB region. The percentage of project effort devoted to each of these modules is as follows: 50% Biological, 25% Catch and Effort, 25% Bycatch. Thus, Biological sampling is the primary program priority. The estimated project effort devoted to biological sampling reflects the collection of black sea bass length and sex data by participant vessels during three trips per month for twelve months (up to 504 trips and 25,200 black sea bass total).

### **Data Delivery Plan:**

All biological data collected from this project to date has been bi-annually submitted to and accepted by the ACCSP biosamples database. With additional funding for the proposed project, the project team will continue to work closely with ACCSP to ensure data is in the correct format to be incorporated into the ACCSP biosamples database. Data will continue to be submitted bi-annually in June and December of the proposed project period.

## **Project Quality Factors**

### **Multi-Partner/Regional impact including broad applications:**

The results of the proposed project have regional impacts and broad applications, as black sea bass are expanding to inhabit, and potentially be harvested from, the majority of the US east coast. Furthermore, the social and economic implications of this work could be extensive, as project data contributes to the improvement of the northern Atlantic black sea bass stock assessment and potentially the creation of new economic opportunities. From a collaboration perspective, this project provides a unique opportunity for the RI DEM and CFRF to maintain a fisherman-based research fleet to address ACCSP priorities, drawing upon networks of partners in industry, fisheries research, and management. This project will help RI DEM and CFRF demonstrate that, with support from ACCSP, they have the ability to bring stakeholders together, outside of a contentious management environment, to collect, communicate, and

analyze critically needed data to address the data needs of the data poor northern Atlantic black sea bass.

**Greater than year 2 contains funding transition plan and justification for continuance:**

This proposal is for a one-year study to continue an industry-based research fleet approach to biological, catch, and bycatch sampling for northern Atlantic black sea bass. The project has been successful through the first five years of funded work and has sampled over 53,000 black sea bass. An additional year of funding would bolster the first year-round, multi-year database for this biologically data poor species. Ultimately, long term maintenance of this project will provide invaluable data to the ACCSP, ASMFC, and MAFMC, and improve the assessment and management of the northern Atlantic black sea bass resource. The CFRF and RI DEM have continued to apply for funding for this project through external sources and have secured supplemental funding to partially support the Research Fleet as described above. Obtaining long-term funding for the Research Fleet is a top and ongoing priority for project PIs and staff.

**In-kind contribution:** The total project cost is \$63,342. In-kind contributions provided by RI DEM and CFRF total \$19,707. Thus, RI DEM and CFRF will provide 31% of total project costs.

**Improvement in data quality/quantity/timeliness:**

The proposed project addresses the critical need to improve the quality, quantity, and timeliness of biological, catch and effort, and bycatch data for the northern Atlantic black sea bass, which the ACCSP Biological Review Panel identified as having inadequate biological sampling and high stakeholder priority, resulting in the highest-ranking priority score. Ultimately, the proposed project will help to meet ACCSP's mission of improving data quality for fisheries science by contributing to a single data management system that will meet the needs of fishery managers, scientists, and fishermen.

**Potential secondary modules as by-products:**

The potential secondary modules are catch and effort (25%) and bycatch sampling (25%). The project effort allocated to the catch and effort module refer to the sampling that occurs while the fishery is open. Although the fishery is open for a large portion of the year, black sea bass is often caught and retained as a non-target species. The project effort allocated to the bycatch module reflects sampling efforts conducted while the commercial black sea bass fishing season is closed and while participant vessels are targeting other species but still interacting with black sea bass as bycatch.

**Impact on stock assessment:**

As described above, the Research Fleet's gear-specific biological data is being directly incorporated into the ongoing 2022 Research Track Stock Assessment for northern black sea bass. This data will improve assessment estimates such as catch-at-length and discards-at-length.

In the future, the Research Fleet collected data has the potential to directly improve the federal stock assessment in a number of additional ways including reducing the uncertainty in gear type specific selectivity, and gear (and location) specific discard and catch characterizations. Currently, the indices of abundance relied upon in the black sea bass stock assessment come primarily from the NEFSC winter and spring trawl survey, Northeast Area Monitoring and Assessment Program (NEAMAP) survey trawls, recreational catch per effort, and is supplemented with various state trawl survey indices of abundance (NEFSC 2017). The utility of the Research Fleet data in this respect is to inform the management about catch and discard structure from a variety of gear types. Whereas the stock assessment currently only delineates between trawl and non-trawl gear types, after building a multiple-year time-series the Research Fleet data could potentially be utilized to create a variety of CPUE indices of abundance (trawl, gillnet, lobster pot, rod & reel, fish pot, and multigear). Further, the Research Fleet data has the potential to be directly used to create a discard characterization for the northern stock sub-unit and reduce uncertainties in the annual total fishery removals.

**Innovative:**

The innovative and cost-effective nature of the proposed project, which relies upon collaboration between a Program partner and the fishing industry, can provide an opportunity for fishermen to constructively engage in the data collection process for black sea bass and provide a model for future data collection efforts in other regions and fisheries. In addition to demonstrating a novel sampling approach, the proposed project also leverages modern technology to improve the efficiency of data collection and communication.

**Properly Prepared:**

This proposal follows the guidelines provided in the ACCSP Funding Decision Document.

**Principal Investigators:**

The co-Principal Investigators of the proposed project are: Jason McNamee (Chief, RI DEM Marine Fisheries), and David Bethoney (Executive Director, CFRF). Curriculum vitae are provided in the following pages.

Jason McNamee will play an advisory/support role in this project, given his existing commitments at the RI DEM Division of Marine Fisheries. More specifically, Jason will provide advice for sampling protocols, act as a liaison to the existing black sea bass assessment/management infrastructure and assist with data analysis as his time permits (data review/analysis will primarily be the role of the CFRF Research Biologist). In his role as both a technical committee member, and as a member of the black sea bass Research Track Stock Assessment Working Group, Jason McNamee will be able to help the project with capturing the correct information and making sure this information is formatted appropriately for inclusion in future northern Atlantic black sea bass stock assessments.



Dr. N. David Bethoney, Executive Director of the CFRF, will serve as the lead Co-PI for the proposed project. Dr. Bethoney will be responsible for overall projection direction and progress towards completing proposed objectives. Dr. Bethoney will be primarily responsible for overseeing proposed data analysis as well as dissemination of project results to the MAFMC and ASMFC. He will also assist in at-sea related research on an as-needed basis.

**Jason Earl McNamee, PhD**  
**519 Congdon Hill Rd**  
**Saunderstown, RI 02874**  
**Day Phone: 401-423-1943**  
**Email: jason.mcnamee@dem.ri.gov**

### **WORK EXPERIENCE**

*RI Department of Environmental Management 12/2002 - Present*  
*Jamestown, RI US*

#### **Chief, Marine Resource Management**

##### *Duties:*

- Management of the Marine Fisheries program for the RI Dept. of Environmental Management
- Management of a staff of 20 professionals in the field of marine fisheries
- Manage operating budgets for multiple federal grants and state accounts
- Creation of grant proposals for marine fisheries projects
- Management of the Ft Wetherill Marine Laboratory building and research vessels
- Membership on several technical panels: the New England Council Science and Statistics Committee (Chair), Atlantic States Marine Fisheries Commission Menhaden (chair), Tautog (chair), and Summer Flounder/Scup/Black Sea Bass technical and stock assessment committees, Biological and Ecological Reference Point committee
- Support to the RI Marine Fisheries Council
- Creation and administration of the RI Marine Fisheries Institute
- Principal investigator (PI) on the Narragansett Bay juvenile seine survey
- PI for the Narragansett Bay Menhaden monitoring program
- Small vessel operation
- Production and review of multiple annual technical and grant completion reports
- Perform stock assessment analyses

*Skills developed:* Personnel and budget management experience; Supervisory experience; Good statistical and computer skills (ADMB, R, Microsoft software, ADAPT, JMP, ASAP, Oracle Discoverer, web design); Species identification experience; Experience using water quality instrumentation (DO meter, pH meter, Gas Chromatograph, Conductivity meter, flow meter); GIS Experience (Arcview and R); Field work experience; Experience in the construction and maintenance of technical research equipment; Seine, fyke net, trawl net, gillnet, fish pot, and electroshock surveying; Small boat handling (State of Rhode Island and Coast Guard certified)

Supervisor's Name: Janet Coit

Supervisor's Phone: 401-222-4700 ext. 2409

*RI Department of Environmental Management 4/2000 - 12/2002*  
*Providence US*

#### **Senior Natural Resource Specialist**

*Duties:* My duties were to perform all tasks necessary to conduct and complete a Total Maximum Daily Load reports including field work, data collection and processing, and writing of the report. I also participated with other staff to help in the completion of their reports.

*Skills developed:* Good statistical and computer background (Microsoft software), Experience designing and implementing a personal research project, Experience preparing a federally approved Quality Assurance Protection Plan, Experience using water quality instrumentation (DO meter, pH meter, Conductivity meter), Experience in the collection of water samples for testing (biological and metals), GIS Experience (Arcview) Field work experience, Small boat handling (State of Rhode Island and Coast Guard certified), Experience in the preparation of a federally approved Total Maximum Daily Load report, Experience disseminating information to the public

Supervisor's Name: Christian Turner

Supervisor's Phone: unsure, no longer employed at RIDEM

## EDUCATION

University of Rhode Island – Graduate School of Oceanography

Narragansett, RI US

PhD – 8/2018

Major: Biological Oceanography

Doctoral Dissertation Topic: Multispecies Statistical Catch-At-Age Model for a Mid Atlantic Species Complex

University of Connecticut

Groton, CT US

Masters of Science Degree - 6/2006

38 Semester Hours

Major: Biological Oceanography

University of Rhode Island

Kingston, RI US

Bachelor's Degree - 5/1996

136 Semester Hours

Major: Zoology

## PROFESSIONAL PUBLICATIONS

- ASMFC Lobster stock assessment (2015), ASMFC Menhaden stock assessment (2004, 2012, 2015), ASMFC Tautog stock assessment (2006, 2011, 2015), NEFSC Summer flounder stock assessment (2011, 2013), NEFSC Scup stock assessment (2011, 2015), NEFSC Black sea bass stock assessment (2004, 2016), Interactions between the introduced Asian shore crab, *Hemigrapsus sanguineus*, and three common rocky intertidal littorine gastropods in Southern New England (MS Thesis).
- Taylor, DL, J McNamee, J Lake, CL Gervasi , and DG Palance. 2016. Juvenile winter flounder (*Pseudopleuronectes americanus*) and summer flounder (*Paralichthys dentatus*) utilization of Southern New England nurseries: Comparisons among estuarine, tidal river, and coastal lagoon shallow-water habitats. *Estuaries and Coasts*. 39:1505-1525.

**Dr. NAIFF DAVID BETHONEY**  
Executive Director  
Commercial Fisheries Research Foundation  
P.O. Box 278  
Saunderstown, RI  
401-515-4662, [dbethoney@cfrfoundation.org](mailto:dbethoney@cfrfoundation.org)

#### EDUCATION:

University of Massachusetts at Dartmouth School for Marine Science and Technology  
PhD Dissertation: Understanding and avoiding River herring and American shad bycatch in the Atlantic herring and mackerel mid-water trawl fisheries.  
Cum. GPA: 3.92  
PhD Received 2013

MA Thesis: Association between diet and epizootic shell disease in the American lobster (*Homarus americanus*) around Martha's Vineyard  
Cum. GPA: 3.93  
M.S. Received 2010

Colby College - Waterville, ME  
Major: Biology with Concentration in Environmental Science  
Cum. GPA: 3.41, Cum Laude  
B.A. Received 2008

SEA Education Association of Woods Hole, MA  
Study Abroad: Fall 2006  
Documenting Change in the Caribbean: Designed and implemented an original biological research project with practical application while at sea. Studied at Woods Hole, and sailed from St. Croix, USVI to Key West, Florida with research stops at Montserrat, Dominican Republic, and Jamaica.

#### WORK EXPERIENCE:

- Commercial Fisheries Research Foundation  
Spring 2020-Present  
  
Executive Director: Responsible for overseeing foundation business manager, scientific staff, interns, and consultants to carry out all tasks associated with ongoing projects and general administration. In addition, responsible for pursuing new partnerships and projects, including proposal development and submission, under the advisement of the foundation Board of Directors.
- UMASS-Dartmouth School for Marine Science and Technology  
Fall 2008-Spring 2020  
  
Research Assistant Professor, Fall 2014-Spring 2020: All responsibilities of research associate position related to drop camera and herring work with the ability to be lead principle investigator on research proposals and serve on student committees.  
  
Research Associate, Summer 2013-Summer 2014: All responsibilities of research assistant position described below with management and development responsibilities for scallop drop camera and groundfish video surveys. Management responsibilities include equipment purchasing and maintenance and oversight of all technical operations and student involvement.  
  
Research Assistant, Summer 2010- Spring 2013: Major responsibilities included coordinating River Herring bycatch avoidance program, assisting the Massachusetts Division of Marine Fisheries port side sampling program, and scallop drop camera survey at-sea data collection and analysis.  
  
Graduate Research Assistant, Fall 2008-2010: Assisted with American lobster research including lobster husbandry, measuring and photographing lobsters, collecting larvae, and setting up housing apparatuses.

#### SCIENTIFIC JOURNAL PUBLICATIONS (LAST 3 YEARS):

1. Heimann T, Verkamp HJ, McNamee J, Bethoney ND. 2023 Mobilizing the fishing industry to address data gaps created by shifting species distribution. *Frontiers in Marine Science*. 10:1043676.
2. Verkamp HJ, Nooj J, Helt W, Ruddick K, Gerber-Williams A, McManus MC, Bethoney ND. 2022. Scoping bay scallop restoration in Rhode Island: a synthesis of knowledge and recommendations for future efforts. *Journal of Shellfish Research* 41(2):153–171
3. Ellertson AE, Waller JD, Pugh TL, Bethoney ND. Differences in the size at maturity of female American lobsters (*Homarus americanus*) from offshore Southern New England and eastern

Georges Bank, USA. 2022. Fisheries Research. DOI: 106276

4. Chen C, Zhao L, Gallager S, Ji R, He P, Davis C, Beardsley RC, Hart D, Gentleman WC, Wang L, Li S, Lin H, Stokesbury KDE, Bethoney ND. 2021 Impact of larval behaviors on dispersal and connectivity of sea scallop larvae over the northeast U.S. shelf. Progress in Oceanography. DOI: 102604

#### GRANTS RECEIVED AS A PRINCIPAL INVESTIGATOR (LAST 2 YEARS):

- |  |                |
|--|----------------|
| 1. "Training and Education Services" (Whelk research)<br>Awarded from: Vineyard Wind I LLC<br>Value: \$150,000   | March 2023     |
| 2. "FY 2023: Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach"<br>Awarded from: Rhode Island Department of Environmental Management<br>Value: \$88,152   | February 2023  |
| 3. "Cooperative Marine Research Project"<br>Awarded from: The Campbell Foundation<br>Value: \$60,000   | January 2023   |
| 4. "Engaging the Fishing Community to Understand Disease and Reproductive Dynamics of Atlantic Sea Scallop"<br>Awarded from: Atlantic States Marine Fisheries Commission<br>Value: \$109,571   | December 2022  |
| 5. "Cooperative Marine Research Project"<br>Awarded from: The Campbell Foundation<br>Value: \$70,000   | November 2022  |
| 6. "SFW01 Construction and Post-Construction Fisheries Monitoring"<br>Awarded from: South Fork Wind LLC<br>Value: \$6,605,913  | October 2022   |
| 7. "Initiating the removal of ghost gear from Rhode Island waters"<br>Awarded from: 11th Hour Racing/The Schmidt Family Foundation<br>Value: \$110,410   | September 2022 |
| 8. "The WHOI/CFRF Shelf Research Fleet - Community Science in a Rapidly Changing Ocean"<br>Awarded from: Woods Hole Oceanographic Institution<br>Value: \$42,486   | May 2022       |
| 9. "Establishing standard methods to assess the biological condition of sea scallops before and after offshore wind farm development"<br>Awarded from: National Oceanic and Atmospheric Administration<br>Value: \$38,706  | April 2022     |
| 10. "FY 2022: Advancing Fishery Dependent Data Collection for Black Sea Bass ( <i>Centropristis striata</i> ) in the Southern New England and Mid-Atlantic Region Utilizing Modern Technology and a Fishing Vessel Research Fleet Approach"<br>Awarded from: Rhode Island Department of Environmental Management<br>Value: \$132,064 | March 2022     |
| 11. "Leveraging wind farm development to test the accuracy and utility of a gear location marking application"<br>Awarded from: National Fish and Wildlife Foundation<br>Value: \$95,207   | January 2022   |

## References:

- Atlantic Coastal Cooperative Statistics Program (ACCSP). 2023. Biological Sampling Priority Matrix. 4 p.
- Atlantic States Marine Fisheries Commission (ASMFC). 2013. Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management. Special Report # 89. ASMFC, Arlington, VA. 58pp.
- Bell, R. J., Richardson, D.E., Hare, J.A., Lynch, P.D., and Fratantoni, P.S. 2014. Disentangling the effects of climate, abundance, and size on the distribution of marine fish: an example based on four stocks from the Northeast US shelf. ICES Journal of Marine Science: fsu217.
- Drohan, A. F., J. P. Manderson, and D. B. Packer. 2007. Essential fish habitat source document: Black sea bass, *Centropristis striata*, life history and habitat characteristics. 2nd Edition. NOAA Technical Memo. NMFS-NE-200, 78 p.
- Moser, J., and G. R. Shepherd. 2009. Seasonal distribution and movement of black sea bass (*Centropristis striata*) in the Northwest Atlantic as determined from a mark-recapture experiment. Journal of Northwest Atlantic Fishery Science 40: 17-28.
- Nelson, G.A. 2014. Cluster Sampling: A Pervasive, Yet Little Recognized Survey Design in Fisheries Research. Transactions of the American Fisheries Society 143 (4): 926-938.
- Northeast Fisheries Science Center (NEFSC). 2011. 53rd Northeast Regional Stock Assessment Workshop (53rd SAW) Assessment Report. US Department of Commerce, Northeast Fish Science Center Reference Document 12-05; 559 p.
- Northeast Fisheries Science Center (NEFSC). 2017. 62<sup>nd</sup> Northeast Regional Stock Assessment Workshop (62<sup>nd</sup> SAW). Assessment Summary Report. US Department of Commerce, Northeast Fish Science Center Reference Document 17-01; 37 p.
- Musick, J. A., and L. P. Mercer. 1977. Seasonal distribution of black sea bass, *Centropristis striata*, in the Mid-Atlantic Bight with comments on the ecology of fisheries of the species. Transactions of the American Fisheries Society. 106: 12-25.
- Southeast Fisheries Science Center (SEFSC). 2013. Stock Assessment of Black Sea Bass off the Southeastern United States: SEDAR Update Assessment. 102 p.
- SEDAR. 2018. SEDAR 56 – South Atlantic Black Seabass Assessment Report. SEDAR, North Charleston SC. 164 pp.
- Steimle, F. W., C. A. Zetlin, P. L. Berrien, and S. Chang. 1999. Essential fish habitat source document: Black sea bass, *Centropristis striata*, life history and habitat characters. NOAA Technical Memorandum NMFS-NE-143: 1-42.
- Waltz, W., Roumillat, W.A., and P. K. Ashe. 1979. Distribution, age structure, and sex composition of the black sea bass, *Centropristis striata*, sampled along the southeastern coast of the United States. Marine Resources Research Institute, South Carolina Wildlife and Marine Resources Department. Technical Report Number 43, December 1979.

Zhang, Y. and S.X. Cadrin .2013. Estimating Effective Sample Size for Monitoring Length Distributions: A Comparative Study of Georges Bank Groundfish, Transactions of the American Fisheries Society 142 (1): 59-67.