

**Development of An Experimental Purse Seine Fishery for  
Atlantic Thread Herring (*Opisthonema oglinum*)**

April 26, 2021 Exempted Fishing Permit request by

Lund's Fisheries, Inc, H&L Axelsson, Inc and Axelsson Seiner, Inc Port of Cape May, NJ

The Atlantic thread herring (*Opisthonema oglinum*) ranges from southern Brazil to the Gulf of Maine and is a coastal pelagic schooling fish, found near the surface. Spawning occurs in May and June off of North Carolina and from April-September in the Gulf of Mexico. The oldest thread herring on record was captured off of North Carolina and was 8 years old. Atlantic thread herring are one of several emerging species, with centers of distribution in the south, that are increasingly encountered in local waters, likely as a response to warming water temperatures. Fishermen and fish dealers, naturally, would like the opportunity to fish for them, within sustainable limits. As Mid-Atlantic Ocean waters warm, more Atlantic thread herring will migrate in the spring into these waters and migrate south in the late fall. These herring have a higher protein content than Atlantic menhaden so should be a valuable recreational bait source.

Lund's Fisheries, Inc, H&L Axelsson, Inc and Axelsson Seiner, Inc have applied for an exempted fishing permit (EFP) to demonstrate the potential for a federal EEZ commercial purse seine fishery for Atlantic thread herring which would occur from May 1 to November 1, 2022, with a 6.6 million pound (3000 mt) catch limit. A multi-year EFP is requested, to maximize biological data-gathering opportunities for estimating stock size potential, and allow investments in the gear to be recovered by the new fishery.

The application is consistent with the MAFMC's Forage Amendment, which provides for the opportunity for experimental fishing "contributing to the development of new or expansion of existing fisheries for Mid-Atlantic forage species." For the fishery to take place, an exemption from the Amendment's possession limit, "of up to 1,700 pounds of all Mid-Atlantic forage species combined per trip in or from the EEZ portion of the Mid-Atlantic Forage Species Management Unit" would be required and is requested.

The fishery will operate from 3 to 30 miles offshore at approximate depths of less than 30 fathoms from Ocean City, MD to Montauk, NY. The four purse seiners and four carrying vessels listed in the application are all active and licensed in the NJ Atlantic menhaden purse seine ITQ fishery. The catching vessels are limited to using a 900' seine in that fishery, which is too small to use effectively offshore. New nets would be constructed this winter and will be 2,000' long and 180' deep with a 1" mesh. The fishermen have related to us that the thread herring can be found at depths of 60 m / 30 fathoms while menhaden are generally found at 20 m / 10 fathoms during the same time of year.

All catch will be landed for sale at Lund's Fisheries' dock in Cape May, NJ. Up to four 50' purse seine vessels and four carrying vessels will participate in the fishery.

A sustainable thread herring fishery would augment the incomes of the fishermen who only operate in the NJ menhaden fishery and would serve to lengthen their fishing season. The menhaden season has been shortened since 2012 with the implementation of ASMFC's quota restrictions.

Dr. Robert Leaf, USM is proposing a sampling protocol to collect data on this fishery, including bycatch, which is included in this presentation. The proposal is anticipated to be funded by the NSF IUCRC Center 'SCMFIS' in October 2021. This project will evaluate the biostatistical characteristics of the fishery and evaluate the magnitude of bycatch. We expect bycatch to be minimal since this fishery will be prosecuted in the same areas as the menhaden purse seine fishery, which has minimal bycatch. Data collection will be aided through the use of the electronic data collection system currently in place at the Lund's Fisheries plant as part of the Squid Electronic Size Monitoring Pilot Project, a collaboration of the Illex industry and NEFSC researchers working in Cooperative Research, Population Dynamics and Information Technology.

Larval surveys (ECOMON), conducted by the NEFSC, show that larval thread herring do occur in the Mid-Atlantic Region (See appendix). Larvae were present most often in the spring and summer for all regions and most years of the survey. However, some of these larvae may be misidentified. A larval fish survey conducted in a southern NJ estuary over 24 years, by Dr. Ken Able of Rutgers University indicated that thread herring larvae were increasing in number (Mean density of 0.561/1000 m<sup>3</sup>). Atlantic thread herring were also captured in the NEFSC and NEAMAP surveys (See appendix). Although these surveys are not pelagic surveys, they do show that these pelagic fish do occur and have been persistent in the northeast.

A commercial purse seine fishery continues to be prosecuted off the Florida coast, in the Gulf of Mexico, but has not taken place in the Atlantic for a number of years due to purse seine restrictions now in place in several southern states (See appendix). An Atlantic commercial purse seine fishery operated for a short time until the State of Florida banned purse seine fishing in state waters. A purse seine fishery also operated in coastal waters off of North Carolina between Cape Hatteras and Cape Fear in the late summer and fall (Smith 1994) in the late 1980s and early 1990s. The herring were harvested for reduction and were aged at 1-5 years.

We have received reports that thread herring are being captured in the Virginia pound net fishery and we have contacted the VMRC, who responded and said that they only have commercial landings for herring, unclassified, some blueback herring and some Atlantic herring. The VMRC said that, historically, Virginia harvesters have not always identified their herring correctly. We are working to obtain any relevant data.

Recreational anglers harvest thread herring off the Atlantic Coast and in the Gulf of Mexico as reported in the MRIP data (See appendix). These anglers predominately use the herring as bait.

Included in the appendix are scientific publications about threadfin herring. Dr. Ed Houde (1977) collected eggs and larvae of the thread herring from eastern Gulf of Mexico and estimated that a potential annual yield of thread herring of 60,300 to 120,600 metric tons in the eastern Gulf.

Submitted to the MAFMC SSC 9/7/21

Dr. Eleanor A. Bochenek, Consultant, Retired Marine Scientist, Rutgers University

Jeff Kaelin, Director of Sustainability and Government Relations, Lund's Fisheries, Inc.

## Appendix

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Separate Folder that Includes Datasets

Separate Folder that includes Thread Herring Literature

## **Characterizing the Thread Herring Fishery in the US Mid-Atlantic.**

**To be submitted to NSF IUCRC, Fall 2021 Meeting**

**Robert Leaf (Univ of So. Mississippi) and Eleanor Bochenek, Consultant, Retired, Rutgers University**

**Project Description:** To complement the Atlantic Thread Herring Exempted Fisheries Permit Application submitted by Lund's and H&L Axelsson, Axelsson's Seiners, we describe a research project for fishery-dependent biostatistical sampling of the target stock. There continues to be interest in exploiting forage fish stocks (e.g. Atlantic Chub Mackerel, Thread Herring) by harvesters. Many of these are "emerging" stocks with increasing abundance in the region. Because of the spatial distribution of these stock and their availability to trawl gear, the stock is poorly represented in fishery-independent data collections. To address the paucity in research and promote the sustainable use of the stock, we propose a study with the following objectives:

- 1.) Describe length-at-age and weight-at-length relationship of Atlantic Thread Herring. Our analysis will include an examination of the utility of alternative ageing structures (otoliths and scales).
- 2.) Describe the length- and age-composition of the commercial catch of Atlantic Thread Herring. We will 'over' sample the catch initially to establish targets for sample sufficiency at the set and landings level.
- 3.) Evaluate length- and age-specific maturity patterns of Atlantic Thread Herring using macroscopic examination of gonads.
- 4.) Make observations on the frequency and diversity of bycatch in the Atlantic Thread Herring fishery. This will be done at the level of the trip (comprising multiple sets) by sorting, identifying, and quantifying bycatch. This will be performed in the processing plant on a subset of trips.
- 4.) Employ a sampling sufficiency evaluation (a bootstrap simulation) to evaluate candidate sampling programs. The goal is to derive a sample allocation scheme that results in high-precision estimates of the length- and age-composition of the annual harvest, by understanding how sets and trips will be sampled in space and time.

The proposed study addresses the needs of the Mid-Atlantic Fishery Management Council to gather "adequate scientific information is available" of forage fish stocks.

**Experimental plan:** The fishery is expected, based on the submitted Permit Application, to be active from May 1 to November 1 between Ocean City, MD and Montauk, NY. If the EFP is approved, the sampling will be initiated in May 1, 2022. Four fishing vessels (of similar size using similar gear) are expected to make five trips a week and make some overnight trips. Because of the capacity of the fishing vessels and their accompanying "carry" vessels, approximately four sets will be made on each trip. The average trip is estimated to result in 80,000 to 100,000 pounds of harvest of Atlantic Thread Herring. Given the characteristics of the harvest, our proposed sampling scheme will have the following design components:

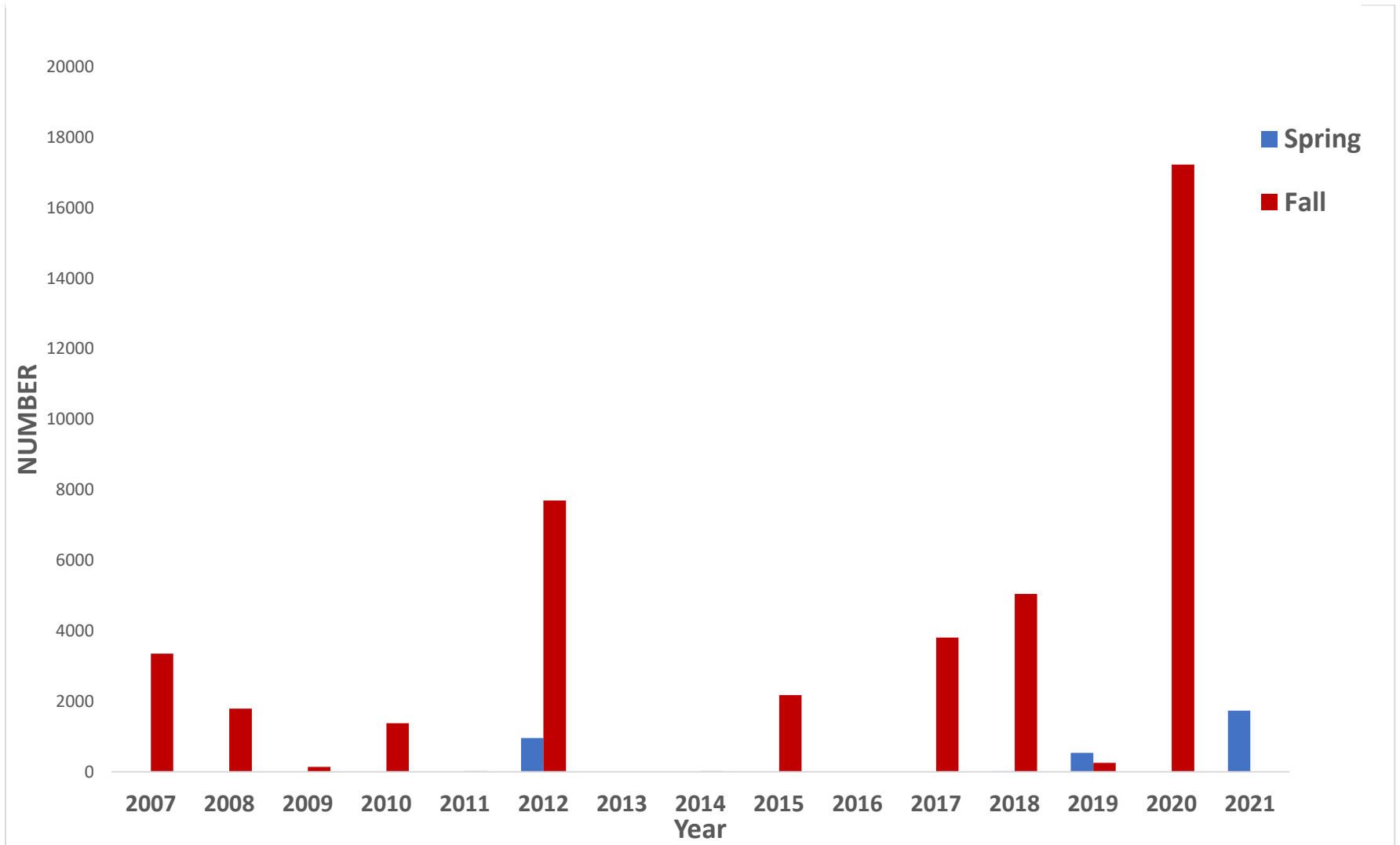
1. Representative coverage of temporal (monthly) and spatial strata.
2. Initial oversampling for length and age at the level of the set. We will work with the carrier vessel captains to sample the catch (50 to 100 fish) at the level of the set from a subset of trips. We will use the bootstrap simulation approach we developed for determination of sampling sufficiency of the Atlantic Chub Mackerel fishery. This will be used to evaluate candidate sample allocation schemes.

3. Adaptive sampling will be used to determine if set-specific information of length and age from the trip is necessary by comparing the compositions at the set-level with those taken at the trip level.

**Related work elsewhere:** The proposed work is similar to the ongoing fishery dependent monitoring by Leaf for the Atlantic Chub Mackerel fishery. We have developed targets for sampling and have described the biostatistical characteristics of that stock.

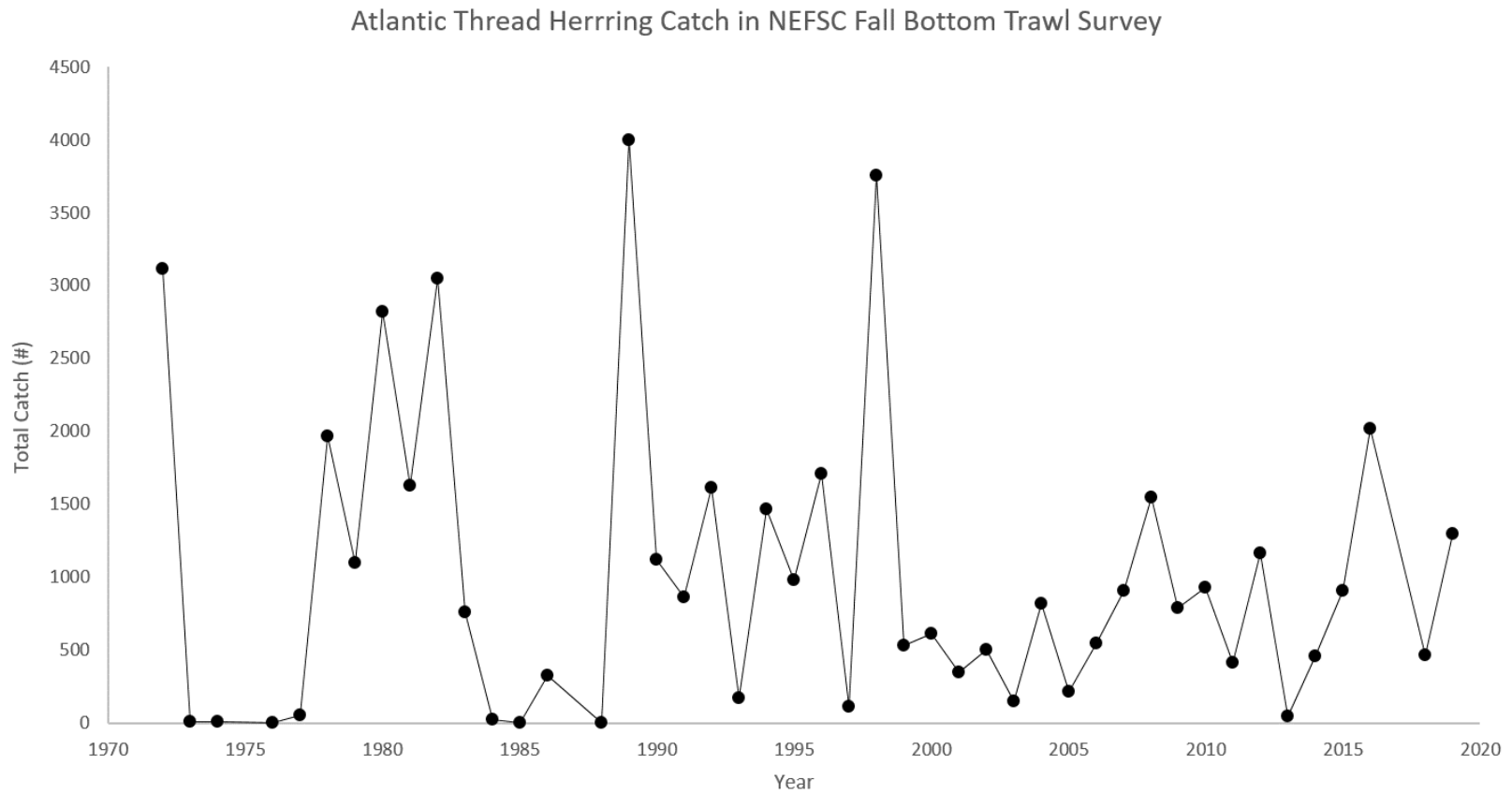
Total number of Atlantic thread herring caught in NEAMAP Spring and Fall Survey by year for all regions. No data were collected in spring 2020. Depth Strata 20-60 ft

\*Data provided by VIMS.

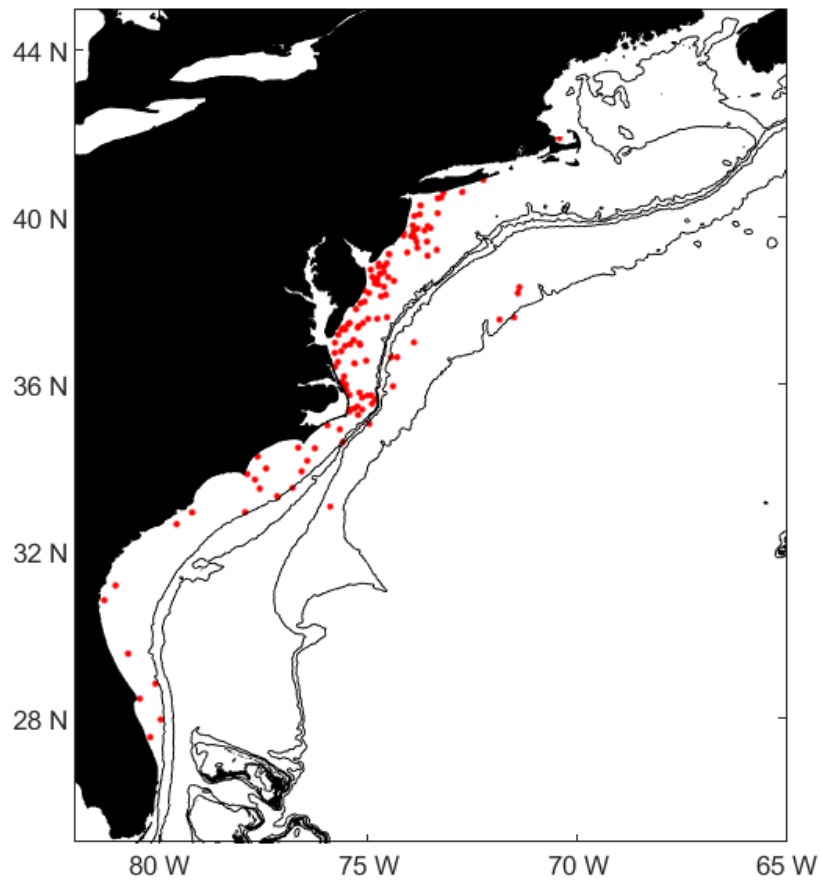


Total catch (#) of Atlantic thread herring in the NEFSC fall bottom trawl survey from 1972-2019.

\*Data provided by NEFSC.

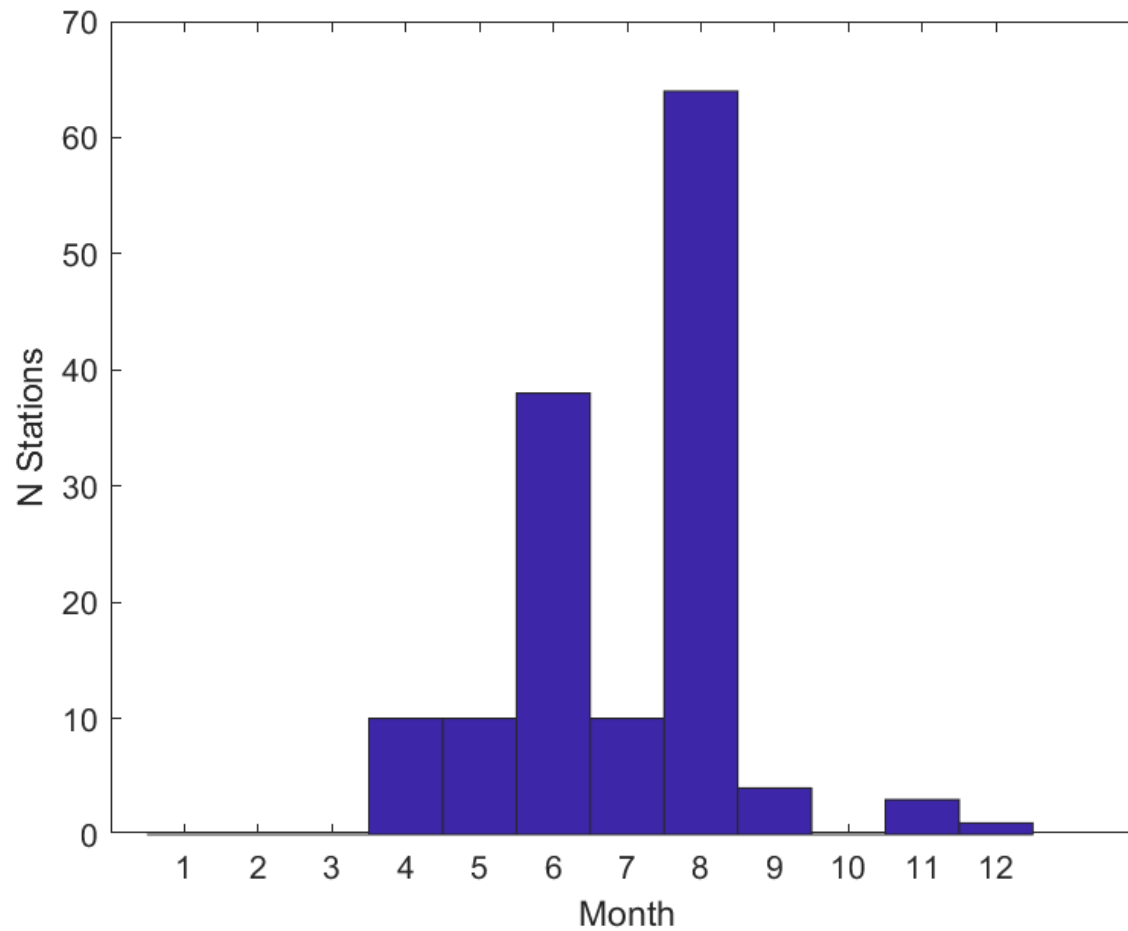


Plot of tows that caught Atlantic thread herring from the NEFSC ECOMON larval fish survey. Some larvae may be misidentified in the database. \*Data provided by NEFSC.

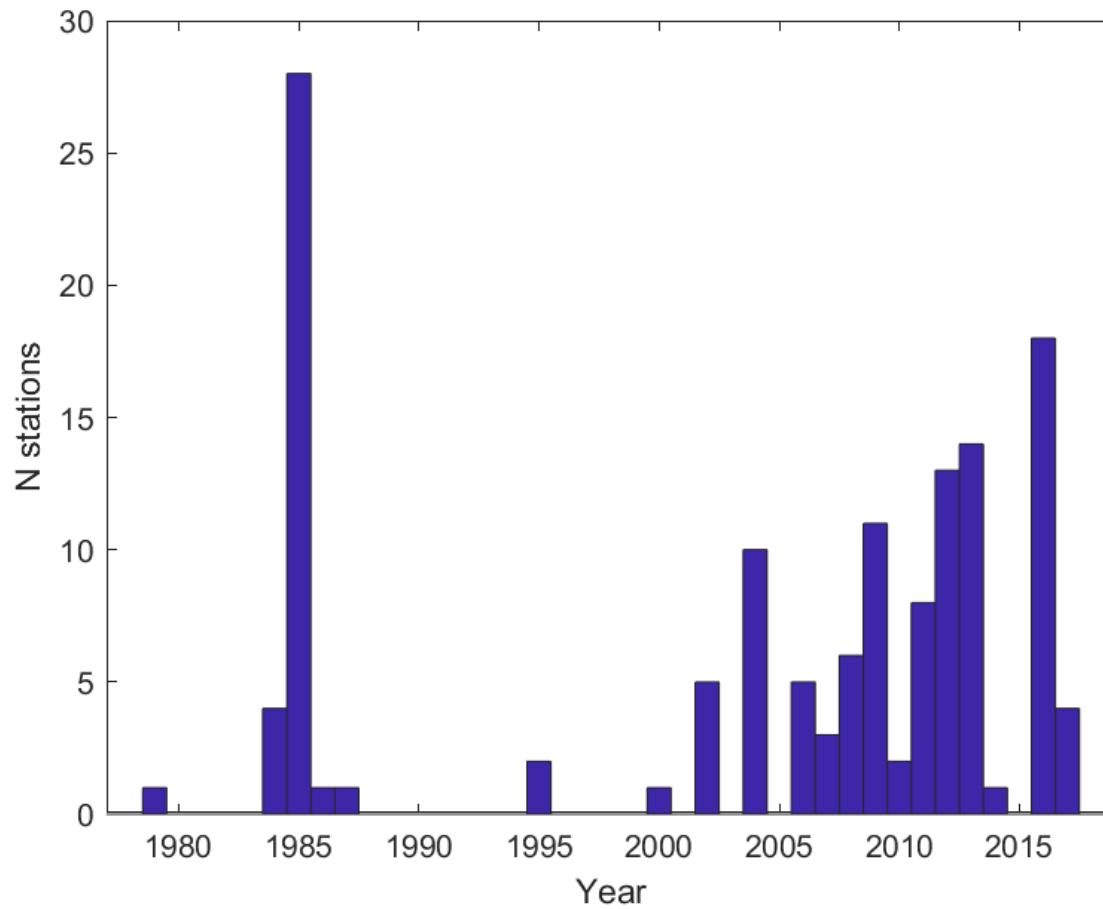




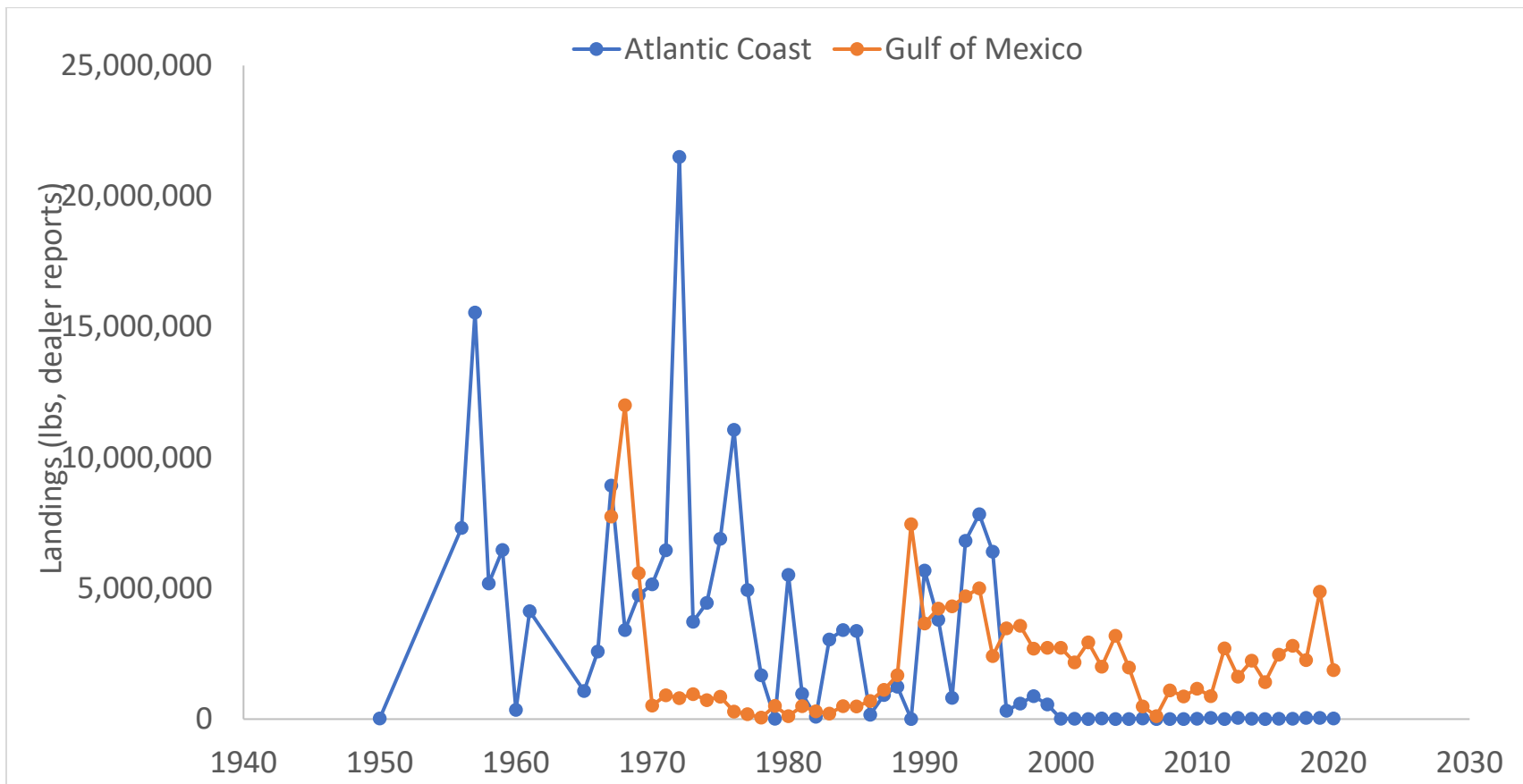
Number of stations by month that contained Atlantic thread herring larvae from the ECOMON survey. Some larvae may be misidentified in the database. \*Data provided by NEFSC.



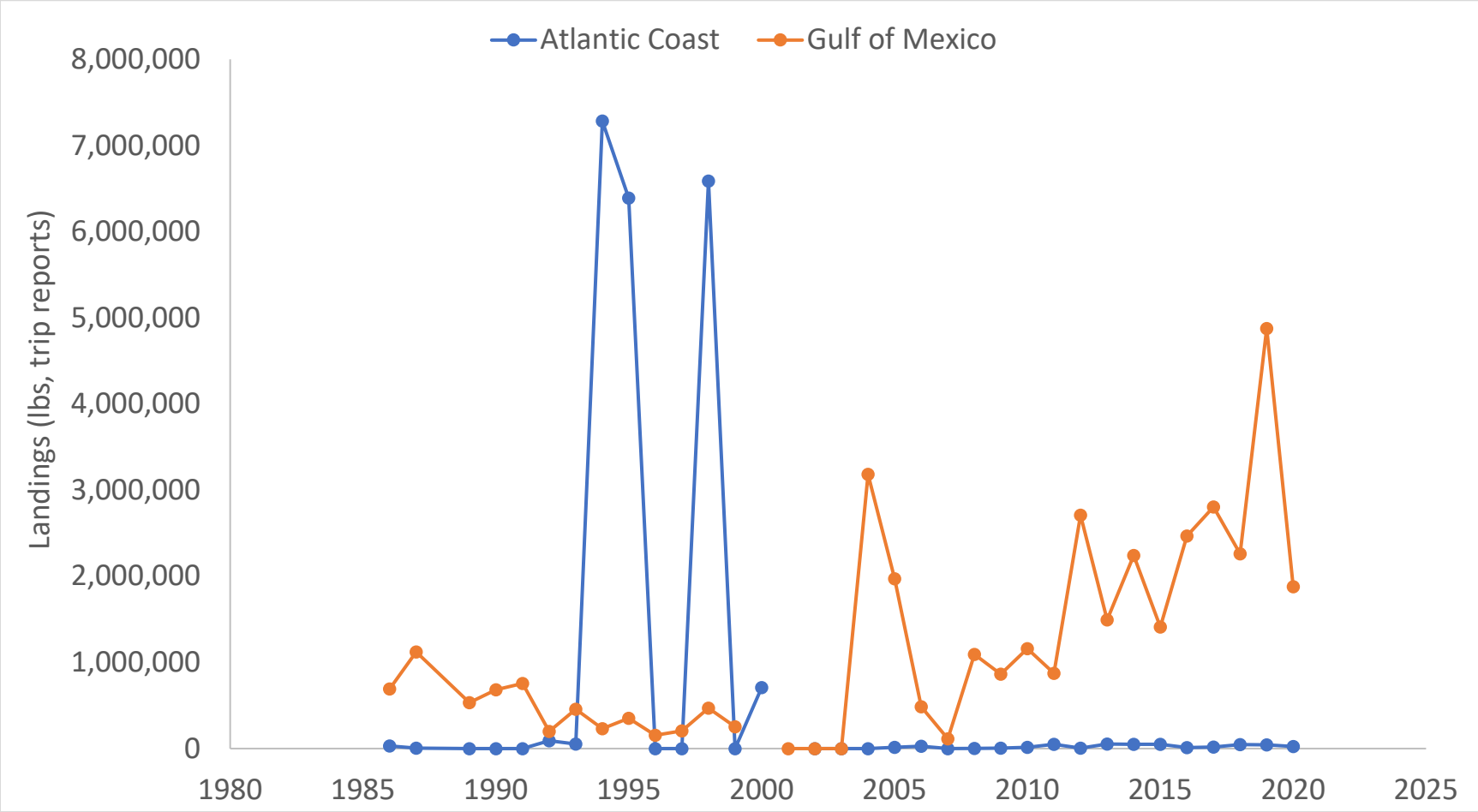
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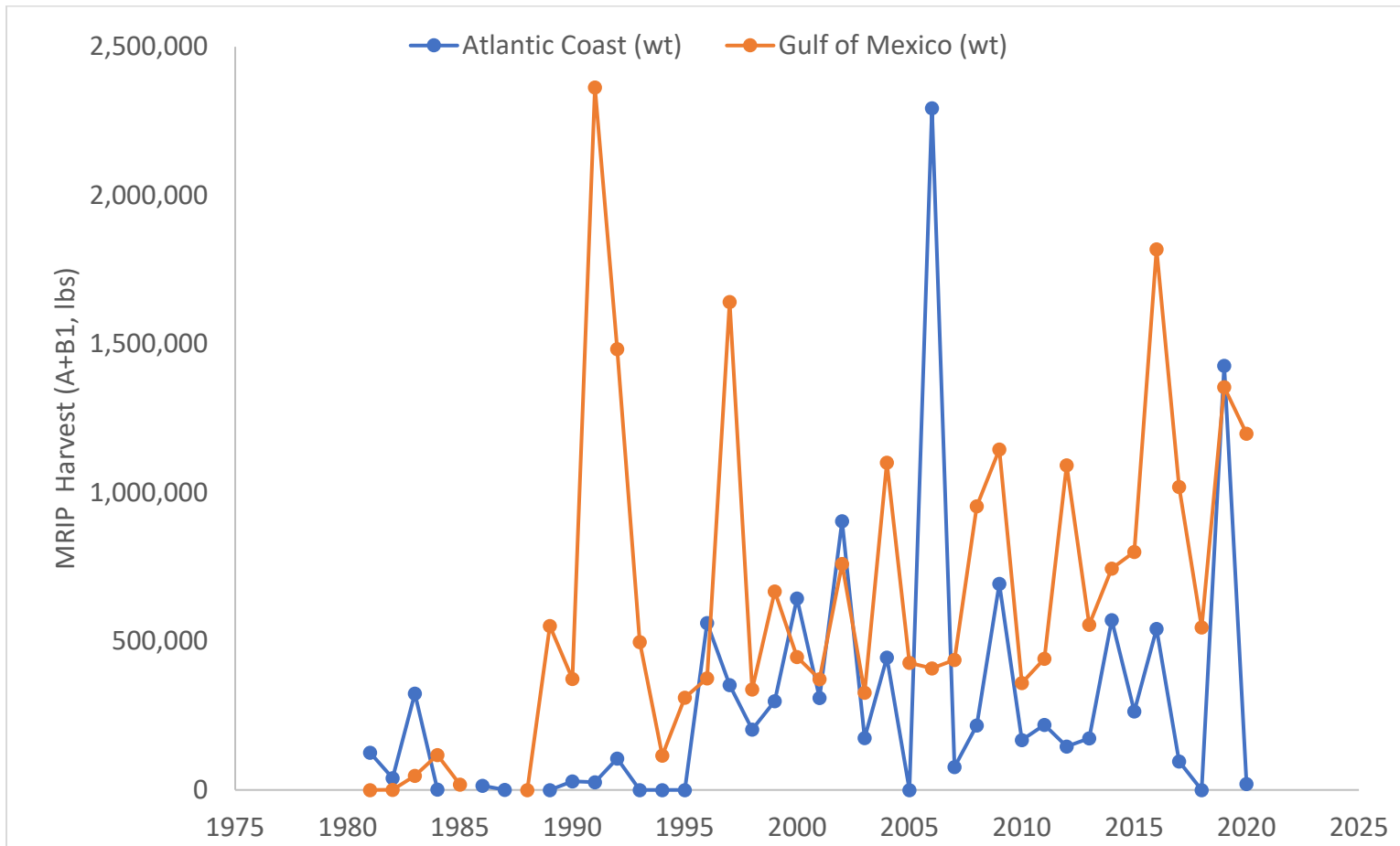
Commercial landings of Atlantic thread herring from non-confidential dealer reports from 1950-2020 for the Atlantic Coast and Gulf of Mexico from the ACCSP



ACCSP non-confidential commercial trip report landings of Atlantic thread herring from the Atlantic Coast and Gulf of Mexico from 1986 -2020



Atlantic thread herring harvest (A+B1) (lbs) from the MRIP data for the Atlantic Coast and Gulf of Mexico from 1981-2021. A=Thread herring that were caught and brought back to dock and identified by a sampler. B1= Thread herring that were caught and killed but not available for identification by the sampler



Number of Atlantic threadfin herring harvested (A+B1) from MRIP for the Atlantic Coast and the Gulf of Mexico from 1981-2021 A=Thread herring that were caught and brought back to dock and identified by a sampler. B1= Thread herring that were caught and killed but not available for identification by the sampler

