ATLANTIC STATES MARINE FISHERIES COMMISSION

REVIEW OF THE INTERSTATE FISHERY MANAGEMENT PLAN

FOR AMERICAN LOBSTER
(*Homarus americanus*)

2020 FISHING YEAR

Prepared by the Plan Review Team

Approved January 25, 2022

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

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***This document covers fishery activities in 2020 as well as trap reductions which took place ahead of the 2021 fishing year*.**

1.0 Status of the Fishery Management Plan

Year of ASMFC Plan's Adoption:	Amendment 3 (1997)
Plan Addenda:	
Addendum II (2001)	Addendum XIV (2009)
Addendum III (2002)	Addendum XV (2009)
Addendum IV (2003)	Addendum XVI (2010)
Addendum V (2004)	Addendum XVII (2012)
Addendum VI (2005)	Addendum XVIII (2012)
Addendum VII (2005)	Addendum XIX (2013)
Addendum VIII (2006)	Addendum XX (2013)
Addendum IX (2006)	Addendum XXI (2013)
Addendum X (2007)	Addendum XXII (2013)
Addendum XI (2007)	Addendum XXIII (2014)
Addendum XII (2008)	Addendum XXIV (2015)
Addendum XIII (2008)	Addendum XXVI (2018)
Management Unit:	Maine through North Carolina
States with a Declared Interest:	Maine through Virginia (Excluding Pennsylvania and DC)
Active Committees:	American Lobster Management Board, Technical Committee, Lobster Conservation Management Teams, Plan Development Team, Plan Review Team, Advisory Panel, Electronic Reporting Subcommittee, Electronic Tracking Subcommittee, Stock Assessment Subcommittee

2.0 Status of the Fishery

2.1 Commercial Fishery

The lobster fishery has seen incredible expansion in landings over the last 40 years. Between 1950 and 1975, landings were fairly stable around 30 million pounds; however, from 1976 to 2008 the average coastwide landings tripled, exceeding 98 million pounds in 2006. Landings continued to increase until reaching a high of 159 million pounds in 2016 (Table 1). In 2020, coastwide commercial landings were approximately 121.9 million pounds, a 4% decrease from 2019 landings of 127.2 million pounds. The largest contributors to the 2020 fishery were Maine and Massachusetts with 80% and 14% of landings, respectively. Landings, in descending order, also occurred in New Hampshire, Rhode Island, New Jersey, Connecticut, New York, Delaware, Maryland, and Virginia. The ex-vessel value for all lobster landings in 2020 was approximately $529 million.

Historically, Lobster Conservation Management Area (LCMA) 1 has had the highest landings, and accounted for 80% of total harvest between 1981 and 2012. This is followed by LCMA 3 which accounted for 9% of total landings during the same time period. In general, landings have increased in LCMA 1 and have decreased in LCMAs 2, 4, and 6. According to state compliance reports, in 2020, approximately 91% of the total landings came from LCMA 1, while the remaining 9% were contributed by LCMA 3, OCC, 2, 4, 6 and 5, in descending order. A map of the LCMAs is found in Figure 1.

Landings trends between the two biological stocks have also changed, as a greater percentage of lobster are harvested from the Gulf of Maine/Georges Bank (GOM/GBK) stock. In 1997, 26.3% of coastwide landings came from the Southern New England (SNE) stock. However, as the southern stock declined and abundance in the Gulf of Maine increased, proportional harvest has significantly changed. In 2000, only 15.6% of landings came from the SNE stock and by 2006, this declined to 7%. In 2020, approximately 2% of coastwide landings came from the SNE stock. In 2020 the GOM/GBK stock accounted for 119 million pounds while the SNE stock accounted for 2.5 million.

2.2 Recreational Fishery

Lobster is also taken recreationally with pots, and in some states, by hand while SCUBA diving. While not all states collect recreational harvest data, some do report the number of pounds landed recreationally and/or the number of recreational permits issued. In 2019, New York reported 1,741 pounds of lobster harvested recreationally, representing 1.4% of state landings. New Hampshire reported 5,305 pounds of lobster harvested recreationally, representing 0.11% of total landings in the state. Maine, Rhode Island, and Connecticut do not collect information on the number of pounds recreationally harvested. For 2020, Rhode Island issued 509 lobster licenses, and lobster licenses sold in Connecticut declined from 875 in 2019 to 286 in 2020. Massachusetts did not provide recreational landings data for 2020 due to data delays related to the COVID-19 pandemic, but for the past five years that data were available (2011-2015) recreational lobster landings represented an average of 1.4% of the total state landings.

3.0 Status of the Stock

The recent 2020 American Lobster Benchmark Stock Assessment presents contrasting results for the two American lobster stock units, with record high abundance and recruitment in the Gulf of Maine and Georges Bank stock (GOM/GBK) and record low abundance and recruitment in the Southern New England stock (SNE) in recent years.

The assessment found that abundance estimates for the GOM/GBK stock show an increasing trend beginning in the late 1980s. After 2008, the rate of increase accelerated to a record high abundance level in 2018, the terminal year of the assessment. The GOM/GBK stock shifted from a low abundance regime during the early 1980s through 1995 to a moderate abundance regime during 1996-2008, and shifted once again to a high abundance regime during 2009-2018 (Figure 2). Current spawning stock abundance and recruitment and are near record highs. Exploitation (commercial landings relative to stock abundance) declined in the late 1980s and has remained relatively stable since.

The GOM/GBK stock is in favorable condition based on the new recommended reference points adopted by the Board (Table 2). The average abundance from 2016-2018 was 256 million lobster, which is greater than the fishery/industry target of 212 million lobster. The average exploitation from 2016-2018 was 0.459, below the exploitation target of 0.461. Therefore the GOM/GBK lobster stock is not depleted and overfishing is not occurring.

In contrast to GOM/GBK, model results for SNE show a completely different picture of stock health. Abundance estimates in SNE have declined since the late 1990s to record low levels. Model estimates of recruitment and spawning stock biomass have also declined to record low levels. Analysis of these estimates indicates a declining trend in stock productivity, indicating reproductive rates are insufficient to sustain a stable population at current exploitation rates. Exploitation of the SNE stock was high and stable through 2002, declined sharply in 2003, and has remained lower and stable since.

Based on the new abundance threshold reference point, the SNE stock is significantly depleted. The average abundance from 2016-2018 was 7 million lobster, well below the threshold of 20 million lobster (Table 2, Figure 3). However, according to the exploitation reference points the SNE stock is not experiencing overfishing. The average exploitation from 2016-2018 was 0.274, falling between the exploitation threshold of 0.290 and the exploitation target of 0.257.

The assessment and peer review panel recommended significant management action be taken to provide the best chance of stabilizing or improving abundance and reproductive capacity of the SNE stock.

4.0 Status of Management Measures

4.1 Implemented Regulations

Amendment 3 established regulations which require coastwide and area specific measures applicable to commercial fishing (Table 3). The coastwide requirements from Amendment 3 are summarized below; additional requirements were established through subsequent Addenda.

Coastwide Requirements and Prohibited Actions

- Prohibition on possession of berried or scrubbed lobsters
- Prohibition on possession of lobster meats, detached tails, claws, or other parts of lobsters by fishermen
- Prohibition on spearing lobsters
- Prohibition on possession of v-notched female lobsters
- Requirement for biodegradable “ghost” panel for traps
- Minimum gauge size of 3-1/4”
- Limits on landings by fishermen using gear or methods other than traps to 100 lobsters per day or 500 lobsters per trip for trips 5 days or longer
- Requirements for permits and licensing
- All lobster traps must contain at least one escape vent with a minimum size of 1-15/16” by 5-3/4”
- Maximum trap size of 22,950 cubic inches in all areas except area 3, where traps may not exceed a volume of 30,100 cubic inches.

Amendment 3 to the Interstate Fishery Management Plan for American Lobster (December 1997)

American lobster is managed under Amendment 3 to the Interstate FMP for American Lobster. Amendment 3 establishes seven lobster management areas. These areas include the: Inshore Gulf of Maine (LCMA 1), Inshore Southern New England (LCMA 2), Offshore Waters (LCMA 3), Inshore Northern Mid-Atlantic (LCMA 4), Inshore Southern Mid-Atlantic (LCMA 5), New York and Connecticut State Waters (LCMA 6), and Outer Cape Cod (OCC). Lobster Conservation Management Teams (LCMTs) comprised of industry representatives were formed for each management area. The LCMTs are charged with advising the Lobster Board and recommending changes to the management plan within their areas.

Amendment 3 also provides the flexibility to respond to current conditions of the resource and fishery by making changes to the management program through addenda. The commercial fishery is primarily controlled through minimum/maximum size limits, trap limits, and v-notching of egg-bearing females.

Addendum I (August 1999)

Establishes trap limits in the seven LCMAs.

Addendum II (February 2001)

Establishes regulations for increasing egg production through a variety of LCMT proposed management measures including, but not limited to, increased minimum gauge sizes in LCMAs 2, 3, 4, 5, and the Outer Cape.

Addendum III (February 2002)

Revises management measures for all seven LCMAs in order to meet the revised egg-rebuilding schedule.

Technical Addendum 1 (August 2002)

Eradicates the vessel upgrade provision for LCMA 5.

Addendum IV (January 2004)

Changes vent size requirements; applies the most restrictive rule on an area trap cap basis without regard to the individual's allocation; establishes LCMA 3 sliding scale trap reduction plan and transferable trap program to increase active trap reductions by 10%; and establishes an effort control program and gauge increases for LCMA 2; and a desire to change the interpretation of the most restrictive rule.

Addendum V (March 2004)

Amends Addendum IV transferability program for LCMA 3. It establishes a trap cap of 2200 with a conservation tax of 50% when the purchaser owns 1800 to 2200 traps and 10% for all others.

Addendum VI (February 2005)

Replaces two effort control measures for LCMA 2 – permits an eligibility period.

Addendum VII (November 2005)
Revises LCMA 2 effort control plan to include capping traps fished at recent levels and maintaining 3 3/8" minimum size limit.

Addendum VIII (May 2006)
Establishes new biological reference points to determine the stock status of the American lobster resource (fishing mortality and abundance targets and thresholds for the three stock assessment areas) and enhances data collection requirements.

Addendum IX (October 2006)
Establishes a 10% conservation tax under the LCMA 2 trap transfer program.

Addendum X (February 2007)
Establishes a coastwide reporting and data collection program that includes dealer and harvester reporting, at-sea sampling, port sampling, and fishery-independent data collection replacing the requirements in Addendum VIII.

Addendum XI (May 2007)
Establishes measures to rebuild the SNE stock, including a 15-year rebuilding timeline (ending in 2022) with a provision to end overfishing immediately. The Addendum also establishes measures to discourage delayed implementation of required management measures.

Addendum XII (February 2009)
Addresses issues which arise when fishing privileges are transferred, either when whole businesses are transferred, when dual state/federal permits are split, or when individual trap allocations are transferred as part of a trap transferability program. In order to ensure the various LCMA-specific effort control plans remain cohesive and viable, this addendum does three things. First, it clarifies certain foundational principles present in the Commission's overall history-based trap allocation effort control plan. Second, it redefines the most restrictive rule. Third, it establishes management measures to ensure history-based trap allocation effort control plans in the various LCMAs are implemented without undermining resource conservation efforts of neighboring jurisdictions or LCMAs.

Addendum XIII (May 2008)
Solidifies the transfer program for OCC and stops the current trap reductions.

Addendum XIV (May 2009)
Alters two aspects of the LCMA 3 trap transfer program. It lowers the maximum trap cap to 2000 for an individual that transfers traps. It changes the conservation tax on full business sales to 10% and for partial trap transfers to 20%.

Addendum XV (November 2009)
Establishes a limited entry program and criteria for Federal waters of LCMA 1.

Addendum XVI: Reference Points (May 2010)
Establishes new biological reference points to determine the stock status of the American lobster resource (fishing mortality and abundance targets and thresholds for the three stock assessment areas). The addendum also modifies the procedures for adopting reference points to allow the Board to take action on advice following a peer reviewed assessment.

Addendum XVII (February 2012)
Institutes a 10% reduction in exploitation for LCMAs within Southern New England (2, 3, 4, 5, and 6). Regulations are LCMA specific but include v-notch programs, closed seasons, and size limit changes.

Addendum XVIII (August 2012)
Reduces traps allocations by 50% for LCMA 2 and 25% for LCMA 3.

Addendum XIX (February 2013)
Modifies the conservation tax for LCMA 3 to a single transfer tax of 10% for full or partial business sales.

Addendum XX (May 2013)
Prohibits lobstermen from setting or storing lobster traps in Closed Area II from November 1 to June 15 annually. Any gear set in this area during this time will be considered derelict gear. This addendum represents an agreement between the lobster industry and the groundfish sector.

Addendum XXI (August 2013)
Addresses changes in the transferability program for LCMAs 2 and 3. Specific measures include the transfer of multi-LCMA trap allocations and trap caps.

Addendum XXII (November 2013)
Implements Single Ownership and Aggregate Ownership caps in LCMA 3. Specifically, it allows LCMA 3 permit holders to purchase lobster traps above the cap of 2000 traps; however, these traps cannot be fished until approved by the permit holder's regulating agency or once trap reductions commence. The Aggregate Ownership Cap limits LCMA fishermen or companies from owning more traps than five times the Single Ownership Cap.

Addendum XXIII (August 2014)
Updates Amendment 3's habitat section to include information on the habitat requirements and tolerances of American lobster by life stage.

Addendum XXIV (May 2015)
Aligns state and federal measure for trap transfer in LCMA's 2, 3, and the Outer Cape Cod regarding the conservation tax when whole businesses are transferred, trap transfer increments, and restrictions on trap transfers among dual permit holders.

Addendum XXVI (February 2018)
Advances the collection of harvester and biological data in the lobster fishery by improving the spatial resolution of data collection, requiring harvesters to report additional data elements, and establishing a deadline that within five years, states are required to implement 100% harvester reporting. The Addendum also improves the biological sampling requirements by establishing a baseline of ten sampling trips per year, and encourages states with more than 10% of coastwide landings to conduct additional sampling trips. Required reporting of additional data elements went into effect on January 1, 2019. The Addendum XXVI requirement for commercial harvesters to report their fishing location by 10 minute longitudinal/latitudinal square was implemented in 2021.

4.2 On-Going Management Actions

In response to signs of reduced settlement in the GOM/GBK, the Board initiated Draft Addendum XXVII in August 2017 to increase resiliency through considering the standardization of management measures in the GOM/GBK stock. Due to the prioritization of actions in response to the Atlantic Large Whale Take Reduction Team recommendations, development of this addendum stalled. Following its review of the 2020 Benchmark Stock Assessment and Peer Review Report, the Board reinitiated development of Draft Addendum XXVII. The Board revised the objective of the addendum given persistent low settlement indices and recent decreases in recruit indices in recent years. The Board specified that the addendum should consider a trigger mechanism such that, upon reaching the trigger, measures would be automatically implemented to increase the overall protection of spawning stock biomass of the GOM/GBK stock.

In August 2021, the Board initiated Draft Addendum XXIX to Amendment 3 to the FMP. The Draft Addendum considers implementing electronic tracking requirements for federally-permitted vessels in the American lobster and Jonah crab fisheries, with the goal of collecting high resolution spatial and temporal effort data. Through this action, the Board seeks to significantly improve the stock assessment, identify areas where lobster fishing effort might present a risk to endangered North Atlantic right whales, and document the footprint of the fishery to help reduce spatial conflicts with other ocean uses like wind energy development and aquaculture, and improve the efficiency of offshore enforcement efforts.

5.0 Ongoing Trap Reductions

Addendum XVIII established a series of trap reductions in LCMAs 2 and 3, with the intent of scaling the size of the SNE fishery to the size of the resource. Specifically, a 25% reduction in year 1 followed by a series of 5% reductions for five years was established in LCMA 2; a series of 5% reductions over five years was established in LCMA 3. The fifth year of reductions took place at the end of the 2019 fishing year and affect trap allocations in the 2020 fishery, completing the required LCMA 3 trap reductions. The sixth year of reductions for LCMA 2 took place at the end of the 2020 fishing year and affect trap allocations in the 2021 fishery. Per Addendum XVIII, states with fishermen in LCMAs 2 and 3 are required to report on the degree of consolidation that has taken place. Trap reductions by jurisdiction ahead of the 2020 fishing year can be found in Table 4. It is important to note that trap reductions also occur as the result of trap

transfers as, per Addendum XIX, there is a 10% conservation tax on trap allocation transfers between owners.

6.0 Fishery Dependent Monitoring

The following provisions of Addendum XXVI went into effect January 1, 2019:

- Required reporting of additional data elements;
- Requirement to implement 100% harvester reporting within five years;
- Baseline biological sampling requirement of ten sea and/or port sampling trips per year.

The Addendum XXVI requirement for commercial harvesters to report their fishing location by 10 minute longitudinal/latitudinal square will not be implemented until 2021. Table 5 describes the level of reporting and monitoring programs by each state. *De minimis* states are not required to conduct biological sampling of their lobster fishery.

In 2020, all states except Rhode Island, New Jersey and Connecticut completed the required ten fishery dependent monitoring through sea and/or port sampling trips. Rhode Island completed nine port sampling trips and no sea sampling trips. Due to the COVID-19 pandemic, at sea observer trips were suspended in New Jersey for 2020. New Jersey continues to monitor the situation and has started to develop protocol for a safe return to normal field operations. No fishery dependent sampling has been conducted by Connecticut since 2014 due to reductions in funding and staffing levels.

7.0 Status of Fishery Independent Monitoring

Addendum XXVI also requires fishery independent data collection by requiring statistical areas be sampled through one of the following methods: annual trawl survey, ventless trap survey, or young-of-year survey. In 2020 a number of surveys could not be completed due to the COVID-19 pandemic, as noted below.

7.1 Trawl Surveys

Maine and New Hampshire: The Maine-New Hampshire Inshore Trawl survey began in 2000 and covers approximately two-thirds of the inshore portion of Gulf of Maine. The spring survey was canceled due to the COVID-19 pandemic. The fall survey began September 21, 2020 in Portsmouth, NH and ended on October 23, 2020 off of Lubec, Maine. Ninety-one out of 120 scheduled tows were completed, resulting in a 76% completion rate. A total of 13,250 lobsters were caught and sampled, with 6,570 females and 6,680 males caught and measured. The total weight of lobsters caught was 3,106.3 kg (Figure 4).

Massachusetts: Since 1978, the Division of Marine Fisheries has conducted spring and autumn bottom trawl surveys in the territorial waters of Massachusetts. For the first time since 1978, neither the spring nor fall bottom trawl surveys were conducted in 2020 due to the COVID-19 pandemic. Survey data are provided through 2019 (Figure 5).

Rhode Island: The Rhode Island DFW Trawl Survey program conducted seasonal surveys in the spring and fall, as well as a monthly survey. In 2020, 44 trawls were conducted in both the

spring and fall. 156 trawls were performed as part of the monthly program. Spring 2020 mean catch per unit effort (CPUE) was 0.02 and 0.52 for legal and sub legal lobsters (respectively); fall 2020 CPUE was 0.07 for legal lobsters and 0.68 for sublegal lobsters. The 2020 mean monthly trawl CPUE was 0.16 and 1.08 per-tow for legal and sublegal lobsters, respectively (Figure 6).

Connecticut and New York: Juvenile and adult abundance are monitored through the Long Island Sound Trawl Survey during the spring (April, May, June) and the fall (September, October) cruises. Due to the COVID-19 pandemic, the spring and fall 2020 Long Island Sound Trawl Surveys were not conducted. The spring 2019 lobster abundance index (geometric mean = 0.1 lobsters/tow) was the third lowest in the time series and is similar to the 2017-2018 indices. Spring abundance in the last nine years has been less than 1.0. All indices from 2004-2019 are below the time series median (3.16). The fall 2019 survey marked the first time since the survey began in 1984 that no lobsters were caught in September and October. The fall time series median (3.54) has not been exceeded since 2004 (Figure 7). Both legal and sublegal size lobster abundance has declined with a similar trajectory.

New York: In 2018, New York initiated a stratified random trawl survey in the near shore ocean waters off the south shore of Long Island from the Rockaways to Montauk Point and the New York waters of Block Island Sound. Prior to 2020 sampling was conducted five times a year during the winter (February), spring (May, June), summer (August), and fall (December). Only two sampling cruises were conducted in 2020 due to the COVID-19 pandemic. These cruises took place during the winter (February) and fall (September into October). The spring and summer trips were canceled due to the pandemic. Thirty and 16 stations were sampled respectively. Only one lobster was caught during the 2020 survey during the February trip. It was a female with a 101 mm carapace length (CL).

New Jersey: An independent Ocean Trawl Survey is conducted from Sandy Hook, NJ to Cape May, NJ each year. The survey stratifies sampling in three depth gradients, inshore (18'-30'), mid-shore (30'-60'), offshore (60'-90'). The mean CPUE, which is calculated as the sum of the mean number of lobsters per size class collected in each sampling area weighted by the stratum area, increased from 2017 to 2018 for all size classes grouped and legal sizes, but decreased for sublegal sizes (Figure 8). No April 2019 Survey was conducted due to Research vessel mechanical issues. Due to the COVID-19 pandemic, 2020 CPUE and indices were not obtained.

Maryland: Maryland conducted a 16-foot otter trawl survey in the coastal bays and has not encountered an American lobster in this survey (1989 - 2020).

7.2 Young of Year Index

Several states conduct young-of-year (YOY) surveys to detect trends in abundance of newly-settled and juvenile lobster populations. These surveys attempt to provide an accurate picture of the spatial pattern of lobster settlement. States hope to track juvenile populations and generate predictive models of future landings.

Maine: There are currently 40 fixed stations along the Maine coast. Of these 40 stations 38 have been sampled consistently since 2001 with two additional sites added to Zone D, off midcoast Maine, in 2005. In recent years, these sites are sampled October to December. YOY survey indices in 2019 increased from 2018 in all statistical areas. The 2020 indices in statistical areas 511, 512, and 513 east are near the time series averages, while the indices for 513 west remain below the series averages (Figure 9).

New Hampshire: New Hampshire Fish and Game conducted a portion of the coastwide American Lobster Settlement Index (ALSI). In 2020, a total of 19 juvenile lobsters were sampled from three sites; 13 older juveniles, 1 YOY lobster, and 5 one-year-old (Y+). Figure 10 depicts the CPUE of lobsters for all NH sites combined, from 2008 through 2020. For each of these four indices, CPUE shows a general upward trend to a time series high in 2011, with sustained moderate to low levels from 2012 through 2020.

Massachusetts: Annual sampling for early benthic phase/juvenile (EBP) lobsters was conducted during August and September, 2020. Sampling was completed at 21 sites spanning 7 regions in Massachusetts coastal waters prior to 2019 when changes to the survey were made discontinuing four locations in SNE (two in Buzzards Bay and both Vineyard Sound sites) and five sites in GOM (two South Shore locations and all three Cape Cod Bay locations). Data for all sites were used to generate annual density estimates of EBP lobster and other decapod crustaceans. In 2020 densities of YOY lobsters remained low compared to the time series average in Boston Harbor and Salem Sound, but densities in 2020 were slightly higher than the preceding two years in all GOM locations (Figure 11). In SNE there were no YOY lobsters found in the Buzzards Bay sampling locations.

Rhode Island: For 2020, the YOY Settlement Survey was conducted using suction sampling at a total of six fixed stations with twelve randomly selected 0.5 m^2 quadrats sampled at each survey station. Average site abundance of lobster at sampling sites has generally declined since the mid-1990's (Figure 12). The 2020 YOY Settlement Survey index was 0.14 lobsters/m^2, and with all lobsters was 0.22/m^2.

Connecticut: The CT DEEP Larval Lobster Survey in western Long Island Sound was discontinued after 2012. Alternative monitoring data are available for the eastern Sound from the Millstone Power Station entrainment estimates of all stages of lobster larvae. Both programs show a protracted decline in recruitment following the 1999 die-off (correlation between programs: R=0.35, p=0.066) (Figure 13).

7.3 Ventless Trap Survey

To address a need for a reliable index of lobster recruitment, a cooperative random stratified ventless trap survey was designed to generate accurate estimates of the spatial distribution of lobster length frequency and relative abundance while attempting to limit the biases identified in conventional fishery dependent surveys.

Maine: The Maine Ventless Trap Survey changed strategies in 2015 to cover more area by

eliminating the vented traps at each site. This change allowed the survey to double the number of sites with ventless traps and increase the sampling coverage spatially to 276 sites. Traps were set during the months of June, July, and August. The stratified mean was calculated for each area using depth and statistical area for ventless traps only. Compared to the previous years, in 2020 there were increases in the number of sublegal (<83 mm CL) and legal sized (≥ 83 mm CL) lobsters caught in the NH-Friendship (513) and Friendship-Schoodic (512) areas. However, sublegal lobster catch in Schoodic Pt-Cutler (511) saw a decrease and legal sized lobster catch did not change significantly in this area (Figure 14).

New Hampshire: Since 2009, NHF&G has been conducting the coastwide Random Stratified Ventless Trap Survey in state waters (statistical area 513). A total of six sites were surveyed twice a month from June through September in 2020. Catch per unit effort (stratified mean catch per trap haul) from 2009 through 2020 is presented in Figure 15. The highest catch value (for ventless traps only) of the time series was recorded in 2019.

Massachusetts: The coast-wide ventless trap survey was initiated in 2006 and expanded in 2007 with the intention of establishing a standardized fishery-independent survey designed specifically to monitor lobster relative abundance and distribution. The survey was not conducted in 2013 due to a lack of funding; however, starting in 2014 the survey has been funded with lobster license revenues and will continue as a long-term survey.

Relative abundance of sub-legal (< 83 mm CL) and legal-sized (≥ 83 mm CL) lobsters for statistical area 514 (part of LCMA 1) is shown in Figure 16 as the stratified mean CPUE, including both vented and ventless traps. The average catch of sublegal lobsters is much higher than the catch of legal-sized lobsters, and generally increased from 2006 through 2016 but has been declining since, with the 2019 and 2020 values below the time series average of 4.73 lobsters/trap. The stratified mean catch per trap of legal-sized lobsters in 2020 was 0.60 (± 0.01), and was above the time series average of 0.57.

Figure 17 shows the time series of relative abundance (stratified mean CPUE) for sub-legal (<86 mm CL) and legal-sized (≥ 86 mm CL) lobsters in the southern MA region (Area 538; part of LCMA 2). The mean sublegal CPUE in 2020 was 0.79 (± 0.06), below the time series average of 1.25 lobsters/trap haul. The CPUE of legal-sized lobsters in 2020 was 0.30 (±0.03), above the time series average of 0.22 lobsters/trap haul. These values are calculated using both vented and ventless traps.

Rhode Island: In 2020, the Ventless Trap Survey was conducted during the months of June-August over 24 sampling sites. A total of 2,387 lobsters were collected from 826 traps over 18 trips. The stratified abundance index of sublegal lobsters in the 2020 survey, 3.62 lobsters per ventless trap, remains below the time series mean of 6.05 lobsters per ventless trap. The abundance index for legal-sized lobsters, at 0.62, was above the time series mean of 0.36 lobsters per ventless trap (Figure 18).

Delaware: A pilot study was initiated in 2018 to assess the population structure of structure-

oriented fish in the lower Delaware Bay and nearshore Atlantic Ocean. Sampling was conducted with commercial sized ventless fish pots, from January to December. In 2020, Delaware encountered 8 American lobsters in lower Delaware Bay and 794 American lobsters in the nearshore Atlantic Ocean with a ratio of 56% males, 34% female and 10% egg laden. The survey ran from April to December. The sampled lobsters ranged in length from 44 mm to 134 mm.

8.0 State Compliance

States are currently in compliance with all required biological management measures under Amendment 3 and Addendum I-XXIV; however, the Plan Review Team (PRT) notes that Rhode Island, New Jersey and Connecticut did not conduct the required amount of sea/port sampling in 2020, as specified in Addendum XXVI. Due to the COVID-19 pandemic, some states had to cancel or limit the amount of surveys conducted. The states' reasons for not meeting the requirement are provided in Section 6.0.

9.0 De Minimis Requests

The states of Virginia, Maryland, and Delaware have requested *de minimis* status. According to Addendum I, states may qualify for *de minimis* status if their commercial landings in the two most recent years for which data are available do not exceed an average of 40,000 pounds. Delaware, Maryland, and Virginia meet the *de minimis* requirement.

10.0 Regulatory Changes

Maine:

- In November 2019, the Department of Marine Resources (DMR) amended the gear marking regulations for persons fishing lobster gear and trap/pot gear in all Maine coastal waters. Effective September 1, 2020, gear marking requirements were changed from red to purple marks. Inside the Exemption Area, fishermen are required to have three purple marks: a 36-inch mark in the top two fathom of their endline, and a 12-inch mark in the middle and at the bottom of their endline. Outside the Exemption Area, fishermen are required to have 4 purple marks: a 36-inch mark in the top two fathom of endline, and 3 12-inch marks at the top, middle, and bottom of their endline. Finally, all lobster gear and trap/pot gear fished outside the Exemption Area is required to have an additional green mark of a minimum of 6-inches in the top two fathom of buoy line. Lobster gear fished inside the Exemption Area is prohibited from having a green mark. In April 2020, DMR amended the gear marking regulation to create a new exception to the previously adopted requirements. Buoy lines of 100 feet or less in length are required to have only two purple marks, one of 36 inches in the top two fathom of the line, and one of 12 inches at the bottom of the line.
- A Resolve passed during the spring of 2020 required DMR to provide the joint standing committee of the Legislature having jurisdiction over marine resources matters with a report that evaluates the limited-entry zone system by February 15, 2021. It required DMR to examine the long waiting period for entry to fish in a limited-entry zone and in examining the waiting list, to consider several factors, including, but not limited to, the current biological status of the fishery, current exit-to-entry ratios in each limited-entry zone, latency of licenses and trap tags and the current policy for student lobster and

crab fishing licenses. It required the department to revisit the recommendations made in the report prepared for the department by the Gulf of Maine Research Institute pursuant to Resolve 2011, chapter 62. It required the department to make recommendations regarding the long waiting period for entry into a limited-entry zone. It also required the department to account for possible new federal regulations to address protections for endangered right whales when making any recommendations. The Resolve authorized the joint standing committee of the Legislature having jurisdiction over marine resources matters to report out legislation to the First Regular Session of the 130th Legislature

- A bill passed in 2020 allowed a qualified resident disabled veteran to obtain upon application, at no cost, a noncommercial lobster and crab fishing license.
- A bill passed in 2020 allowed a person who holds a lobster and crab fishing license to raise or haul any lobster trap during any time of the day from September 1st to October 31st in the "gray zone" if that person is authorized to fish in that area.

New Hampshire

- Regulation changes were made to lobster gear marking in 2020, providing an option of red or yellow rope marking until January, 1, 2022 when all fishers will be required to have yellow.

Massachusetts

- 5/1/20 – DMF adjusted coastal lobster permit transfer regulations. The regulations now allow for trap allocations for LCMAs 2 and OCC to be transferred in increments of 10 traps or more (rather than 50 traps or more) and eliminated the requirement that the individual trap allocations for LCMAs 2 and OCC be retired if they fall below 50-traps.

Virginia

- In February 2020, the Virginia Marine Resources Commission passed regulatory language to establish minimum size of escape vents in lobster traps to comply with Addenda II and IV to the Interstate Fishery Management Plan for American Lobster.

11.0 Enforcement Concerns

Maine

- Maine Marine Patrol Officers documented violations for illegal lobsters, gear violations, and license violations in 2020. One fisherman was charged for exceeding the boat trap limit, multiple individuals were charged with molesting lobster gear, one fisherman was charged with fishing improperly tagged gear in a secondary zone and multiple fisherman were charged with possessing a large quantity of undersized lobsters; all are facing lengthy license suspensions. Patrol officers spent thousands of hours conducting complaint investigations, educational outreach; as well as, routine and targeted enforcement patrols both near and offshore. Marine Patrol placed a strong emphasis on proactive enforcement through high visibility patrols on shore and at sea. The Bureau of Marine Patrol continues to consider the Maine lobster fishery as one that operates with

a high degree of regulatory compliance which is supported by evaluating the number of harvesters inspected versus the number of violations documented.

Massachusetts

- The outcome of one potential scrubbed egger case from the fall of 2019 is still pending (the case is progressing the criminal court system), another scrubbed egger case resulted in a three month permit suspension. There are no other enforcement cases that we are aware of for 2020.

New York

- No major enforcement issues in New York during 2020. There were a few gear tagging issues. Due to COVID protocols, limited lobster gear was hauled for inspection.

New Jersey

- During the 2019 calendar year, seven summonses were issued within New Jersey state waters. Of those seven, two were issued due to possession of illegal sized lobster, one for possession of egg bearing female lobsters, and four for permitting violations.

12.0 Research Recommendations

The full list of research recommendations can be found in the 2020 Stock Assessment Report. Below is a summarized list of the high priority research recommendations from the 2020 Stock Assessment that were compiled by the Lobster Technical Committee (TC) and Stock Assessment Subcommittee (SAS).

Port and Sea Sampling - The quality of landings data has not been consistent spatially or temporally. Limited funding, and in some cases, elimination of sea sampling and port sampling programs will negatively affect the ability to characterize catch and conservation discards, limiting the ability of the model to accurately describe landings and stock conditions. It is imperative that funding for critical monitoring programs continues, particularly for offshore areas from which a large portion of current landings originate in SNE. Sea sampling should be increased in Long Island Sound (statistical area 611), and in the statistical areas in federal waters, particularly those fished by the LCMA 3 fleet, via a NMFS-implemented lobster-targeted sea sampling program.

Commercial Data Reporting – Finer resolution spatial data are paramount in understanding how landings align between statistical area and LCMAs. Vessel tracking is recommended for federal vessels. Once in place, the new spatial data should be analyzed for comparison to current spatial understanding of harvest. The growing Jonah crab fishery in SNE continues to complicate the differentiation of directed lobster versus Jonah crab effort. More sea sampling and landings data must be collected to better differentiate the two fisheries' activities.

Ventless Trap Survey - Calibration work to determine how catch in the ventless trap surveys relates to catch in the bottom trawl surveys remains an important and unaddressed topic of research. Ventless traps may be limited in their ability to differentiate between moderately high and extremely high abundance, and calibration with bottom trawl surveys may help to

clarify how q might change with changes in lobster density.
NEAMAP Trawl Survey Protocols - The SAS recommends that the NEAMAP Trawl Survey sampling protocol be modified for all lobsters caught to be sorted by sex. If a subsample is necessary, subsamples be taken by sex for additional biological data (size, egg presence and stage, vnotch, etc.) This modification would align the biological sampling methodology with other trawl surveys used in the assessment, and perhaps allow the survey to not be collapsed by sex into survey slots.

Time Varying Growth - Growth of American lobster has been found to change through time (McMahan et al. 2016), yet the ability to incorporate this dynamic in the assessment model currently is unavailable. Accounting for interannual changes in the growth matrix, including those in increment, probability, and seasonality, is imperative for model convergence. Modification to the assessment model is needed to allow for time varying growth matrices to be used to reflect changing growth in the stocks.

Expansion of Growth Matrices - Exploration of expanding the model size structure to smaller sizes could allow the SAS to better capture changes in recruitment for the population by incorporating < 53mm lobster abundances from the surveys currently used, as well as incorporating additional surveys that currently are not model inputs for the assessment, such as those from the young of year settlement surveys. Due to decreased recruitment in SNE and some areas in GOMGBK, available survey data should be evaluated to determine whether current data sources for small sizes are sufficient for expanding the size structure and growth matrices.

Temperature-Molt Dynamics - Understanding how the timing for molting, molt increments, and probability by size vary with temperature for all stocks would allow for more accurate and realistic depictions of growth via updated annual growth matrices. The work of Groner et al. (2018) should be expanded by using the Millstone data to specifically analyze how molt frequency and increment has changed seasonally and interannually.

Larval Ecology - Spatial expansion of larval surveys and further testing is warranted, particularly in areas like the eastern GOM and GBK that lack any studies of this nature. Studies that explore greater spatial coverage of larval sampling and examine lobster larval diets, in situ development time in current conditions, larval interactions with well-mixed versus stratified water columns, and varying growth and mortality with temperature would allow for greater context on these variables' influence on recruitment.

Deepwater Settlement - There is a need to determine settlement success in habitat not currently sampled and its contribution to overall stock productivity. Research needs to explore the levels of detectability, impact of stratification, and interannual temperature effects on the indices. Additionally, it will be important to understand whether there are differences in growth and survival in these deeper habitats, particularly relative to the desire to expand the growth matrix into smaller size ranges for modeling purposes.

SNE Recruitment Failure - The direct cause of the precipitous declines in recruitment under less variable spawning stock biomass is largely unknown. Research designed to understand the causes driving recruitment failure is vital for any efforts toward rebuilding the SNE stock. In addition, being able to predict similar conditions in GOMGBK could allow management the opportunity to respond differently.

Stock Structure Working Group - The SAS recommends that a workshop on stock boundaries be convened prior to the initiation of the next assessment to review results of any new research and re-evaluate appropriate stock boundaries. Inclusion of Canadian researchers at this workshop would be beneficial to share data and knowledge on this shared resource.

Spatial Analyses of Fisheries-Independent Data – Northeast Fisheries Science Center (NEFSC) trawl survey data remains one of the richest data sources to understand abundance and distribution patterns through time for lobsters by size and sex. Formal analyses of NEFSC trawl survey and the ME/NH trawl survey and should be performed. The Ecosystem Monitoring (EcoMon) Program's larval lobster information should also be considered.

Reevaluate Baseline Natural Mortality Rate - Intensive hypothesis-driven sensitivity analyses should be conducted to evaluate the base mortality rate for both stocks by season and year. Canadian tagging data should be examined to determine how natural mortality rates derived from these data compare to the assumptions used currently in the model and sensitivity analyses. Exploration of additional time series representing natural mortality hypotheses (e.g. sea temperature, shell disease prevalence, predators) should be continued to either inform time-varying natural mortality or correlate to rates produced in sensitivity analyses.

Predation Studies - It is suspected that a given predator's role in lobster natural mortality has changed through time. Predation laboratory studies and gut content analyses would provide greater guidance on individual species' roles in lobster natural mortality. With this information, predation-indices as a function of predator annual abundances and their contribution to stock-specific lobster mortality would be immensely valuable, particularly in SNE.

Management Strategy Evaluation - Developing a true management strategy evaluation tool that can iteratively project and refit the operating model would best inform future management discussions on rebuilding the SNE stock or providing resiliency for the GOM stock and fishery.

Economic Reference Points - Economic analyses considering landings, ex-vessel value, costs, associated economic multipliers, number of active participants, and other factors are imperative to truly discern how declines in the population would impact the GOMGBK industry. The SAS strongly recommends a thorough economics analysis be conducted by a panel of experts to more properly inform economic-based reference points, and ultimately provide resiliency to both the GOMGBK stock and fishery.

13.0 Plan Review Team Recommendations

During their review of the state compliance reports, the PRT noted the following issues:

- Massachusetts was unable to provide compliance reports by the August 1 deadline. This has been a recurring issue over the last few years due to delays in data availability and limited staff resources.
- In 2020, Rhode Island, New Jersey, and Connecticut did not meet the Addendum XXVI minimum requirement of ten sea/port sampling trips, completing nine, zero, and zero trips, respectively. The compliance reports for Rhode Island and New Jersey explain that sampling was impeded by the COVID-19 pandemic. For Connecticut, no fishery dependent sampling has been conducted by since 2014. Reductions in funding and staffing levels have hindered our ability to resume these activities

The PRT Recommends the Board approve the *de minimis* requests of DE, MD, and VA. Other than the issues noted above, all states appear to be in compliance with the requirements of the FMP.

The following are general recommendations the PRT would like to raise to the Board:

- The PRT recommends the Board consider reviewing the monitoring requirements in SNE given the status of the stock and the difficulty obtaining sea sampling trips in a fishery with reduced effort. The TC has discussed the need for additional sampling trips in federal waters as the fishery has shifted offshore.
- The PRT recommends the TC discuss the best way to present state index information in the annual compliance reports to provide more detailed resolution of adult and juvenile abundance and size composition of the stock.
- The PRT recommends the Board engage with the Committee on Economic and Social Sciences (CESS) to consider available socioeconomic data to develop metrics that could be used to characterize changes in the fishery.

14.0 Tables

Table 1. Landings (in pounds) of American Lobster by the states of Maine through Virginia. Source: ACCSP Data Warehouse for 1981-2019 landings; state compliance reports for 2020 landings. *C= confidential data.*

	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	Total
1981	22,631,614	793,400	11,420,638	1,871,067	807,911	890,218	593,801	55,700	63,108	2,173	**39,129,630**
1982	22,730,253	807,400	11,265,840	3,173,650	880,636	1,121,644	846,215	90,700	64,788	4,713	**40,985,839**
1983	21,976,555	1,310,560	12,867,378	5,114,486	1,654,163	1,207,442	769,913	56,700	76,192	20,619	**45,054,008**
1984	19,545,682	1,570,724	12,446,198	5,259,821	1,796,794	1,308,023	927,474	103,800	98,876	37,479	**43,094,871**
1985	20,125,177	1,193,881	13,702,702	5,140,131	1,381,029	1,240,928	1,079,723	118,500	82,295	42,881	**44,107,247**
1986	19,704,317	941,100	12,496,125	5,667,940	1,253,687	1,416,929	1,123,008	109,000	57,593	93,105	**42,862,804**
1987	19,747,766	1,256,170	12,856,301	5,317,302	1,571,811	1,146,613	1,397,138	84,100	49,820	60,241	**43,487,262**
1988	21,739,067	1,118,900	12,977,313	4,758,990	1,923,283	1,779,908	1,557,222	66,200	22,966	53,696	**45,997,545**
1989	23,368,719	1,430,347	15,645,964	5,786,810	2,076,851	2,344,932	2,059,800	76,500	17,502	45,107	**52,852,532**
1990	28,068,238	1,658,200	16,572,172	7,258,175	2,645,951	3,431,111	2,198,867	68,300	24,941	58,260	**61,984,215**
1991	30,788,646	1,802,035	15,998,463	7,445,172	2,673,674	3,128,246	1,673,031	54,700	26,445	7,914	**63,598,326**
1992	26,830,448	1,529,292	14,969,350	6,763,087	2,534,161	2,651,067	1,213,255	21,000	27,279	753	**56,539,692**
1993	29,926,464	1,693,347	14,350,595	6,228,470	2,177,022	2,667,107	906,498	24,000	46,650	2,940	**58,023,093**
1994	38,948,867	1,650,751	16,176,551	6,474,399	2,146,339	3,954,634	581,396	8,400	7,992	460	**69,949,789**
1995	37,208,324	1,834,794	15,903,241	5,362,084	2,541,140	6,653,780	606,011	25,100	26,955	5,210	**70,166,639**
1996	36,083,443	1,632,829	15,312,826	5,295,797	2,888,683	9,408,519	640,198	20,496	28,726	C	**71,311,517**
1997	47,023,271	1,414,133	15,010,532	5,798,529	3,468,051	8,878,395	858,426	C	34,208	2,240	**82,487,785**
1998	47,036,836	1,194,653	13,167,803	5,617,873	3,715,310	7,896,803	721,811	1,359	19,266	1,306	**79,373,020**
1999	53,494,418	1,380,360	15,875,031	8,155,947	2,595,764	6,452,472	931,064	C	41,954	6,916	**88,933,926**
2000	57,215,406	1,709,746	14,988,031	6,907,504	1,393,565	2,883,468	891,183	C	62,416	C	**86,051,319**
2001	48,617,693	2,027,725	11,976,487	4,452,358	1,329,707	2,052,741	579,753	C	31,114	C	**71,067,578**
2002	63,625,745	2,029,887	13,437,109	3,835,050	1,067,121	1,440,483	264,425	C	20,489	C	**85,720,309**
2003	54,970,948	1,958,817	11,321,324	3,561,391	C	946,449	209,956	C	22,778	C	**72,991,663**
2004	71,574,344	2,851,262	11,675,852	3,059,319	646,994	996,109	370,536	13,322	14,931	27,039	**91,229,708**
2005	68,729,623	C	11,291,145	3,174,852	713,901	1,154,470	369,003	C	39,173	21,988	**85,494,155**
2006	75,419,802	2,612,389	12,090,423	3,949,299	806,135	1,252,146	470,878	3,706	26,349	28,160	**96,659,287**
2007	63,987,073	2,468,811	10,046,120	2,299,744	568,696	911,761	334,097	C	26,804	C	**80,643,106**
2008	69,910,434	2,568,088	10,606,534	2,782,000	427,168	712,075	304,479	C	32,932	C	**87,343,709**
2009	81,124,201	2,986,981	11,789,536	2,842,088	412,468	731,811	C	6,064	30,988	21,472	**99,945,609**
2010	96,244,299	3,648,004	12,772,159	2,928,688	441,622	813,513	692,869	C	29,989	16,345	**117,587,488**
2011	104,957,224	3,919,195	13,385,393	2,754,067	198,928	344,232	697,883	8,879	41,077	12,879	**126,319,757**
2012	127,464,332	4,229,227	14,486,344	2,706,384	247,857	550,441	919,351	C	65,813	10,823	**150,680,572**
2013	128,015,530	3,817,707	15,158,509	2,155,762	127,420	496,535	660,367	C	62,522	9,061	**150,503,413**
2014	124,941,217	4,374,656	15,312,852	2,412,875	127,409	222,843	526,368	26,330	57,414	11,099	**148,013,063**
2015	122,685,803	4,721,826	16,450,414	2,315,708	205,099	147,414	445,060	22,894	29,284	9,474	**147,032,976**
2016	132,750,484	5,782,056	17,784,921	2,260,335	254,346	218,846	349,880	C	29,254	2,854	**159,432,975**
2017	112,170,139	5,513,999	16,493,125	2,031,143	130,015	150,317	409,062	32,364	29,136	1,630	**136,960,928**
2018	121,227,261	6,082,881	17,697,083	1,905,689	110,580	112,685	344,547	C	24,893	2,727	**147,508,347**
2019	101,939,979	6,093,615	17,029,462	1,795,212	111,573	112,107	291,072	C	C	1,840	**127,374,858**
2020	97,843,707	5,013,854	16,753,623	1,701,291	125,421	122,655	316,011	C	10,035	C	**121,886,597**

Table 2. Above: Current (2016-2018) reference abundance estimates (millions), current target and threshold abundance (millions), and new recommended abundance reference points for both stocks. Below: Current (2016-2018) exploitation, current target and threshold exploitation, and new recommended target and threshold exploitation for both stocks.

Quantity	GOMGBK	SNE
Current (2016-2018 average)	256	7
Current Target	119	32
Current Threshold	58	25
Fishery/Industry Target	212	NA
Abundance Limit	125	NA
Abundance Threshold	89	20

Quantity	GOMGBK	SNE
Current (2016-2018 average)	0.459	0.274
Current Target	0.457	0.379
Current Threshold	0.510	0.437
Recommended Target	0.461	0.257
Recommended Threshold	0.475	0.290

Table 3. 2020 LCMA specific management measures

Management Measure	LCMA 1	LCMA 2	LCMA 3	LCMA 4	LCMA 5	LCMA 6	OCC
Min Gauge Size	3 1/4"	3 3/8"	3 17/32"	3 3/8"	3 3/8"	3 3/8"	3 3/8"
Vent Rect.	1 15/16 x 5 3/4"	2 x 5 3/4"	2 1/16 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"	2 x 5 3/4"
Vent Cir.	2 7/16"	2 5/8"	2 11/16"	2 5/8"	2 5/8"	2 5/8"	2 5/8"
V-notch requirement	Mandatory for all eggers	Mandatory for all legal size eggers	Mandatory for all eggers above 42°30'	Mandatory for all eggers in federal waters. No v-notching in state waters.	Mandatory for all eggers	None	None
V-Notch Definition[1] (possession)	Zero Tolerance	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	1/8" with or w/out setal hairs[1]	State Permitted fisherman in state waters 1/4" without setal hairs Federal Permit holders 1/8" with or w/out setal hairs[1]
Max. Gauge (male & female)	5"	5 ¼"	6 3/4"	5 ¼"	5 ¼"	5 ¼"	State Waters none Federal Waters 6 3/4"
Season Closure				April 30-May 31[2]	February 1-March 31[3]	Sept 8-Nov 28[4]	February 1-April 30

[1] A v-notched lobster is defined as any female lobster that bears a notch or indentation in the base of the flipper that is at least as deep as 1/8", with or without setal hairs. It also means any female which is mutilated in a manner that could hide, obscure, or obliterate such a mark.

[2] Pots must be removed from the water by April 30 and un-baited lobster traps may be set one week prior to the season reopening.

[3] During the February 1 – March 31 closure, trap fishermen will have a two week period to remove lobster traps from the water and may set lobster traps one week prior to the end of the closed season.

[4] Two week gear removal and a 2 week grace period for gear removal at beginning of closure. No lobster traps may be baited more than 1 week prior to season reopening.

Table 4: Trap allocation reductions as required by Addendum XVIII for LCMA 2 and 3 fishermen. This table only represents trap allocation reductions reported ahead of the 2020 fishing year and does not represent aggregate trap reductions over multiple years. Traps can also be retired due to the 10% conservation tax on trap transfers. Sources of the trap allocations come from state compliance reports and GARFO 2020 trap allocations published for the trap transfer program.

	Jurisdiction	# of Trap Allocated (For 2021 Fishing Year)	# of Traps Retired (from 2020 to 2021 Fishing Year)	Comments on Trap Transfers
LCMA 2	MA	29,244	1,635	368 traps transferred
	RI	60,385	2,226	4,946 traps transferred
	CT	1,815	93	
	NOAA (ME, NH, NY, NJ)	62,480	132	1,320 traps transferred out
LCMA 3	NOAA	103,206	406243	2,430 traps transferred out

Table 5. 2020 sampling requirements and state implementation. All states have 100% active harvester reporting except for Maine which has 10% harvester reporting. Sufficient sea sampling can replace port sampling. *De minimis* states (denoted by *) are not required to conduct biological sampling of their lobster fishery.

State	100% Dealer Reporting	10% Harvester Reporting	Sea Sampling	Port Sampling	Ventless Trap Survey	Settlement Survey	Trawl Survey
ME	✓	✓ (10%)	✓		✓	✓	✓
NH	✓	✓	✓	✓	✓	✓	✓
MA	✓	✓	✓		✓	✓	[a]
RI	✓	✓	[a]	✓	✓	✓	✓
CT	✓	✓	[b]	[b]		[c]	✓
NY	✓	✓	✓	✓			✓
NJ	✓	✓	[a]				[a]
DE*	✓	✓			✓		✓
MD*	✓	✓					✓
VA*	✓	✓					

[a] Sampling hindered or not completed due to the COVID-19 pandemic

[b] No fishery dependent sampling has been conducted by CT since 2014 due to reductions in funding and staffing levels.

[c] Larval data are available for the eastern Sound (ELIS) from the Millstone Power Station entrainment estimates of all stages of lobster larvae (Dominion Nuclear CT, Annual Report 2016).

Table 6. 2020 sea and port sampling trips and samples by state. *De minimis* states (denoted by *) are not required to conduct biological sampling of their lobster fishery.

State	Sea Sampling			Port Sampling		Market Sampling		Totals	
	Trips	Samples	Traps	Trips	Samples	Trips	Samples	Trips	Samples
ME	111	137,378	25,574	0	0	0	0	111	137,378
NH	19	10,579	0	12	1,000	0	0	31	11,579
MA	52	28,036	10,752	0	0	0	0	52	28,036
RI	0	0	0	9	242	0	0	9	242
CT	0	0	0	0	0	0	0	0	0
NY	1	5	No Data	23	1,857	0	0	24	1,862
NJ	0	0	0	0	0	0	0	0	0
DE*	0	0	0	0	0	0	0	0	0
MD*	0	0	0	0	0	0	0	0	0
VA*	0	0	0	0	0	0	0	0	0
Total	183	175,998	36,326	44	3,099	0	0	227	179,097

15.0 Figures

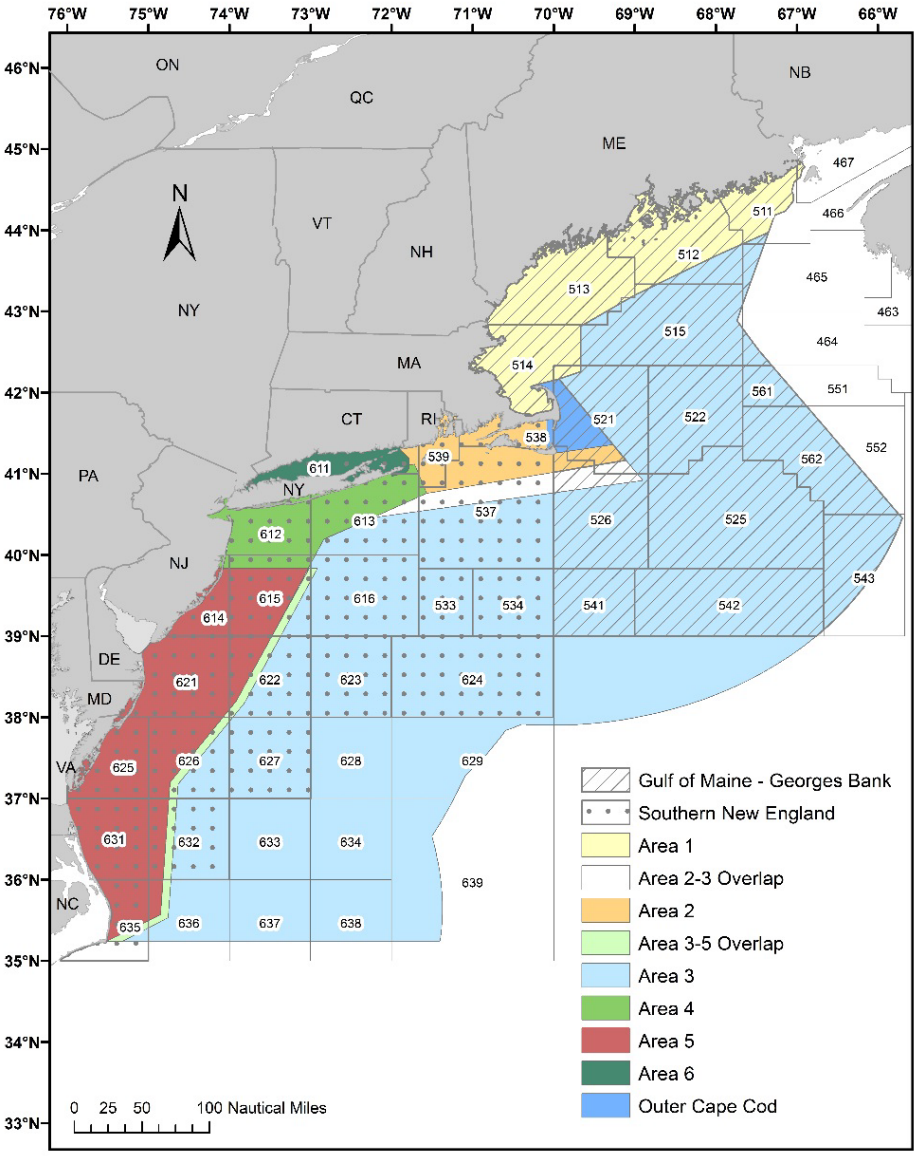

Figure 1. Lobster Conservation Management Areas (LCMAs) and stock boundaries for American lobster.

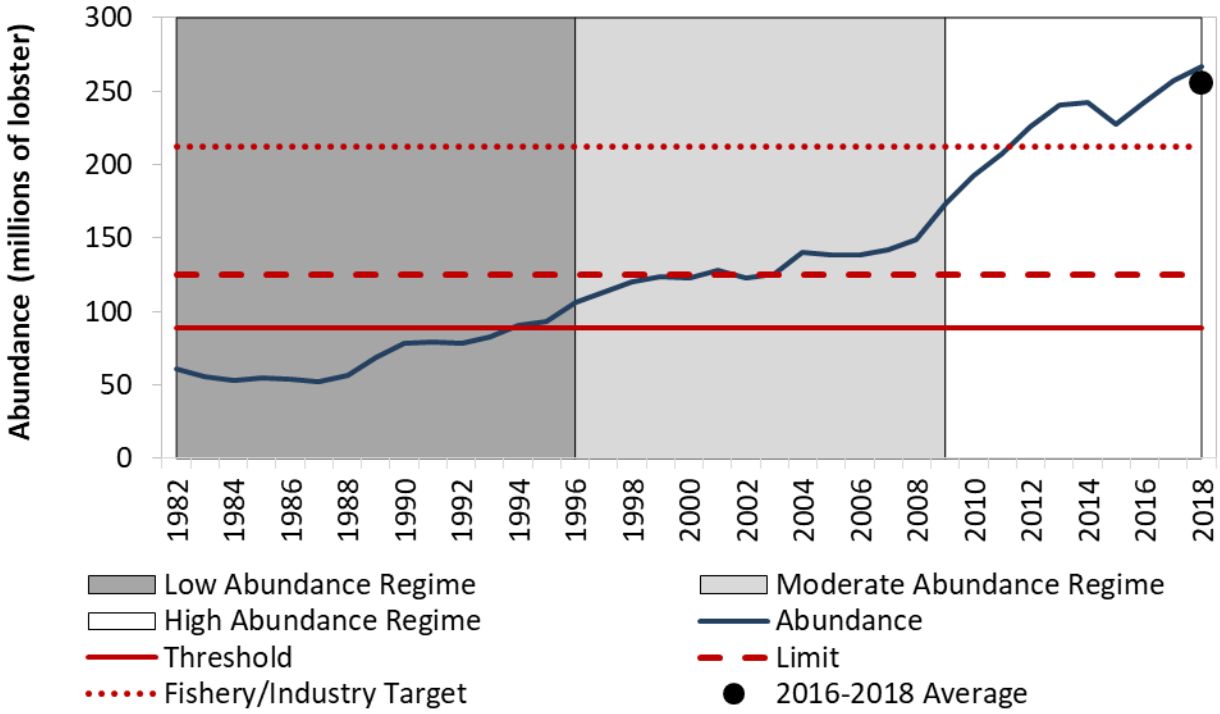

Figure 2. Abundance for GOM/GBK Relative to Reference Points. Source: 2020 Benchmark Stock Assessment for American Lobster.

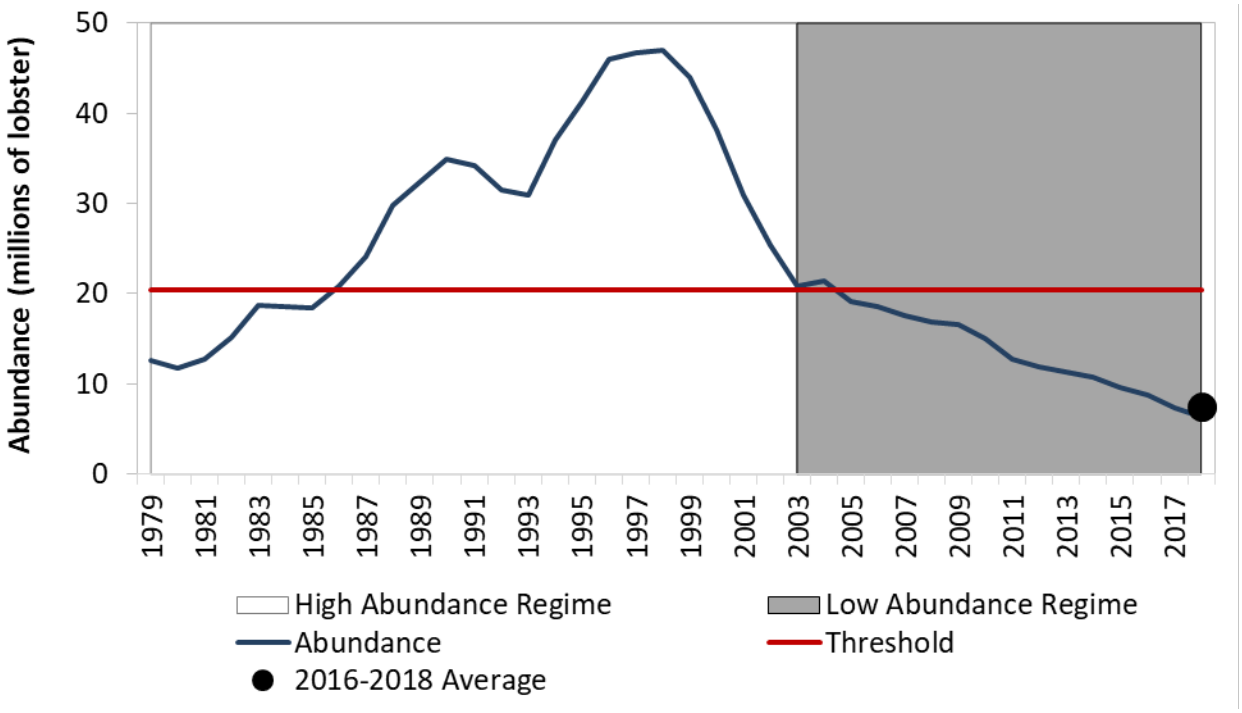

Figure 3. Abundance for SNE Relative to Reference Points. Source: 2020 Benchmark Stock Assessment for American Lobster.

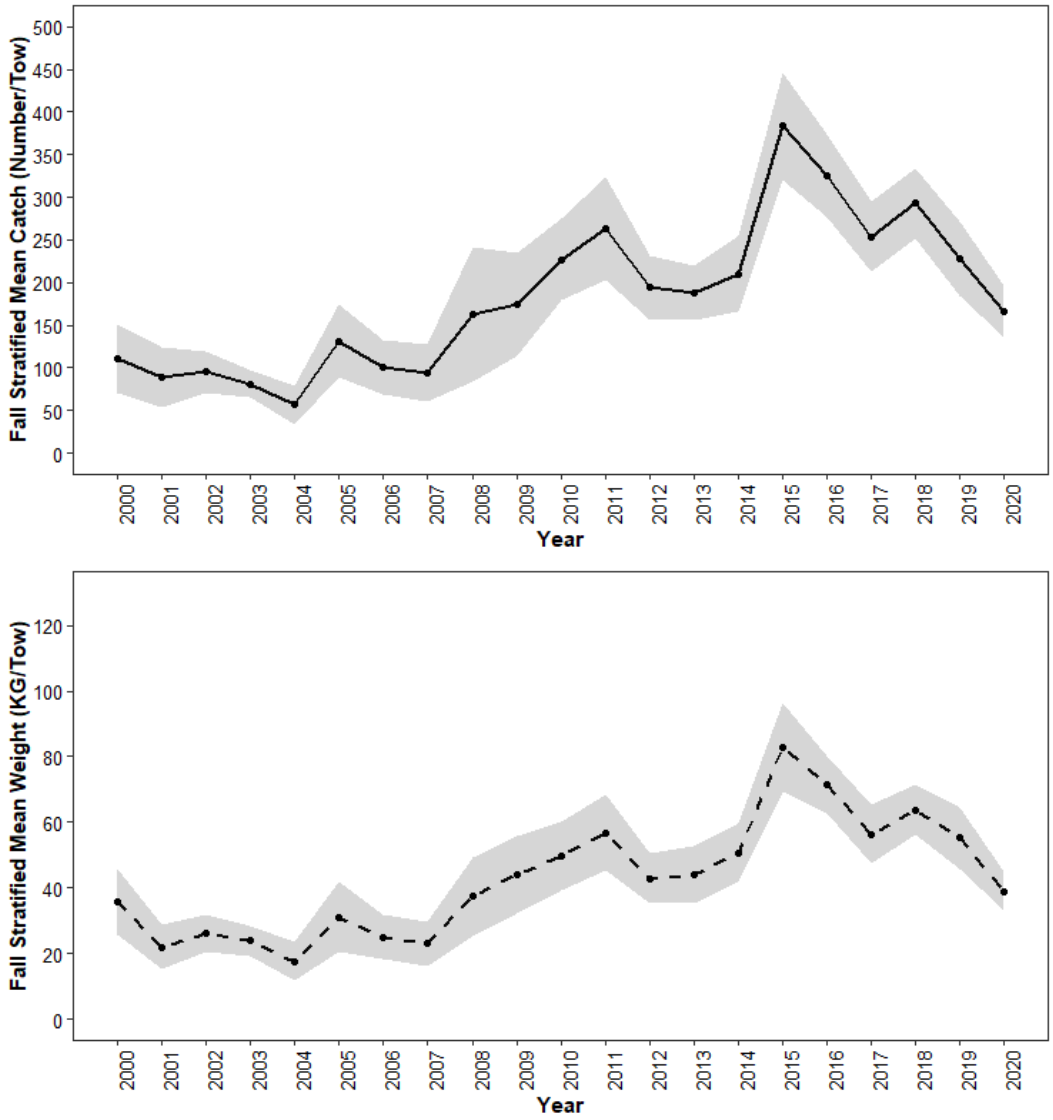

Figure 4. Stratified mean catch and weight indices for American lobster on the fall ME/NH Inshore Trawl Survey (2000-2020).

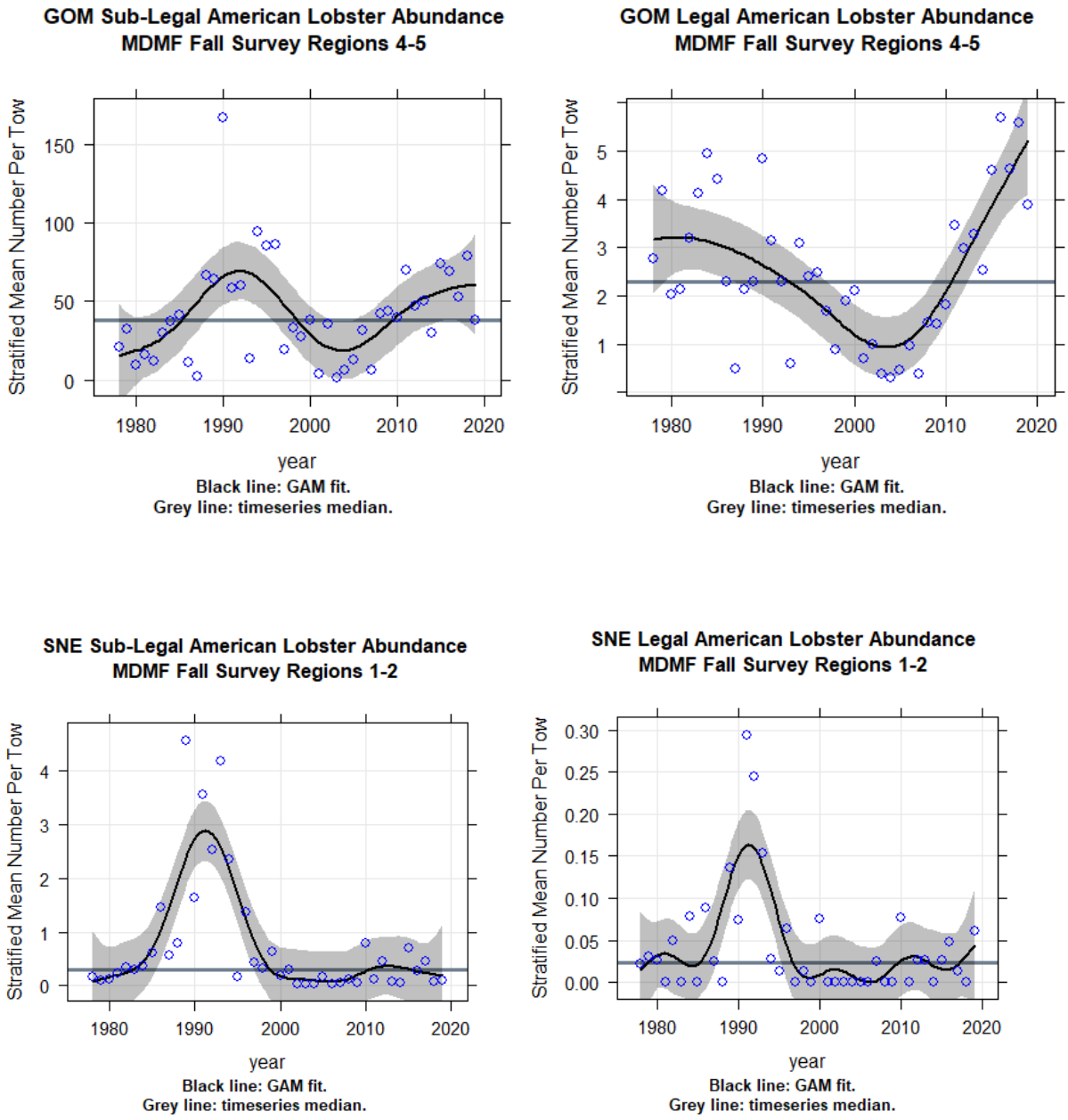

Figure 5. MADMF Fall Trawl Survey sublegal (left) and legal (right) indices from 1978-2019 sexes combined. The top charts are from Gulf of Maine and the bottom charts are from Southern New England.

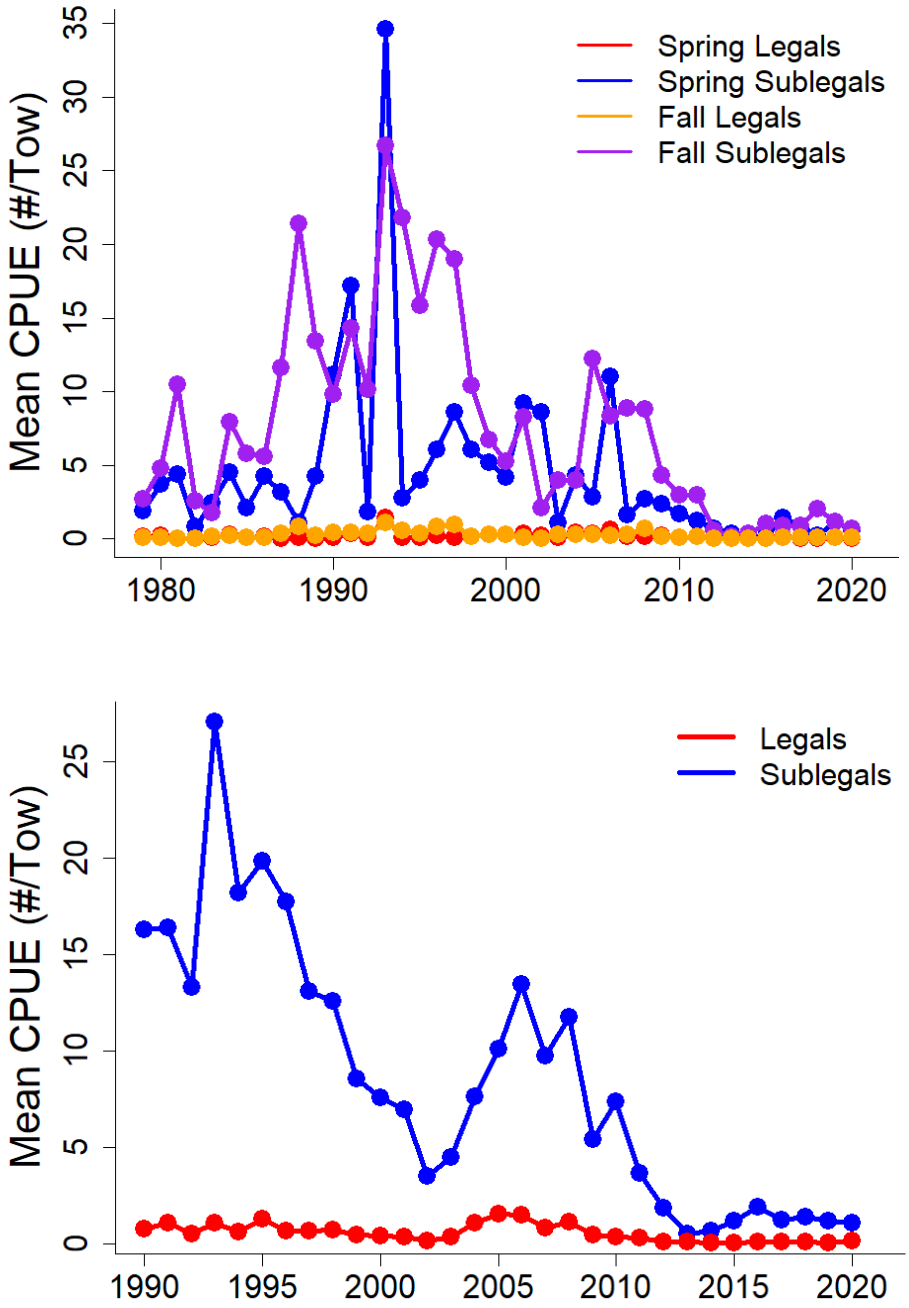

Figure 6. RIDFW Seasonal (spring and fall) Trawl lobster abundances (top) and Monthly Trawl lobster abundances (bottom). CPUE is expressed as the annual mean number per tow for sub-legal (<85.725mm CL) and legal sized (>=85.725mm CL) lobsters.

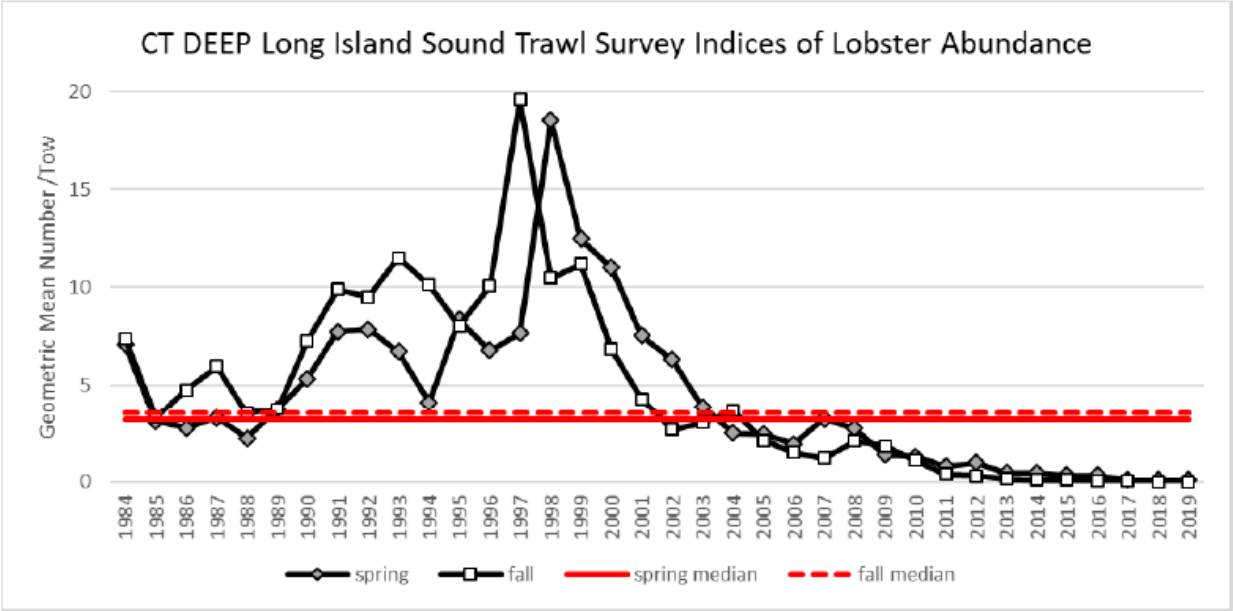

Figure 7. Results of the Long Island Sound Trawl Survey during spring (April-June) and fall (September-October) within NMFS statistical area 611.

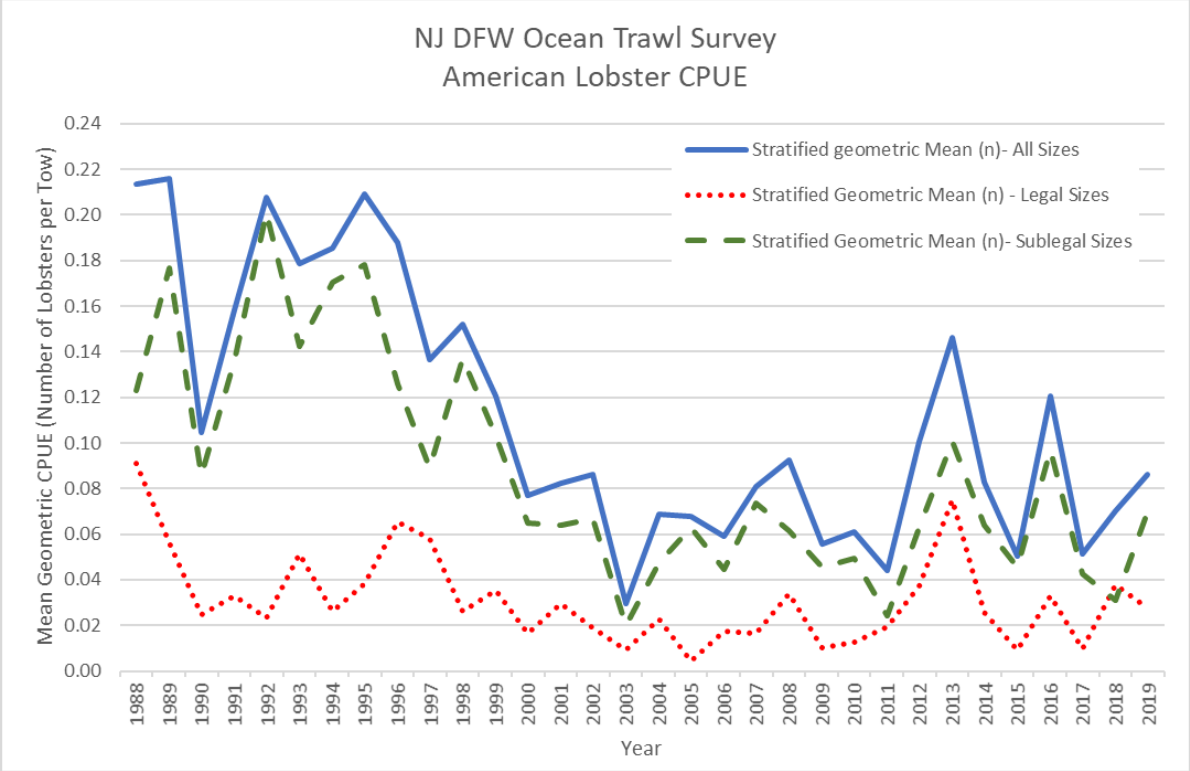

Figure 8. Stratified mean CPUE of all lobsters collected aboard the NJDFW Ocean Trawl Survey. The mean CPUE was calculated as the sum of the mean number of lobsters per size class collected in each sampling area weighted by the stratum area. *NOTE: No April 2019 Survey was conducted due to Research vessel mechanical issues. Due to the COVID-19 pandemic, 2020 CPUE and indices were not obtained.

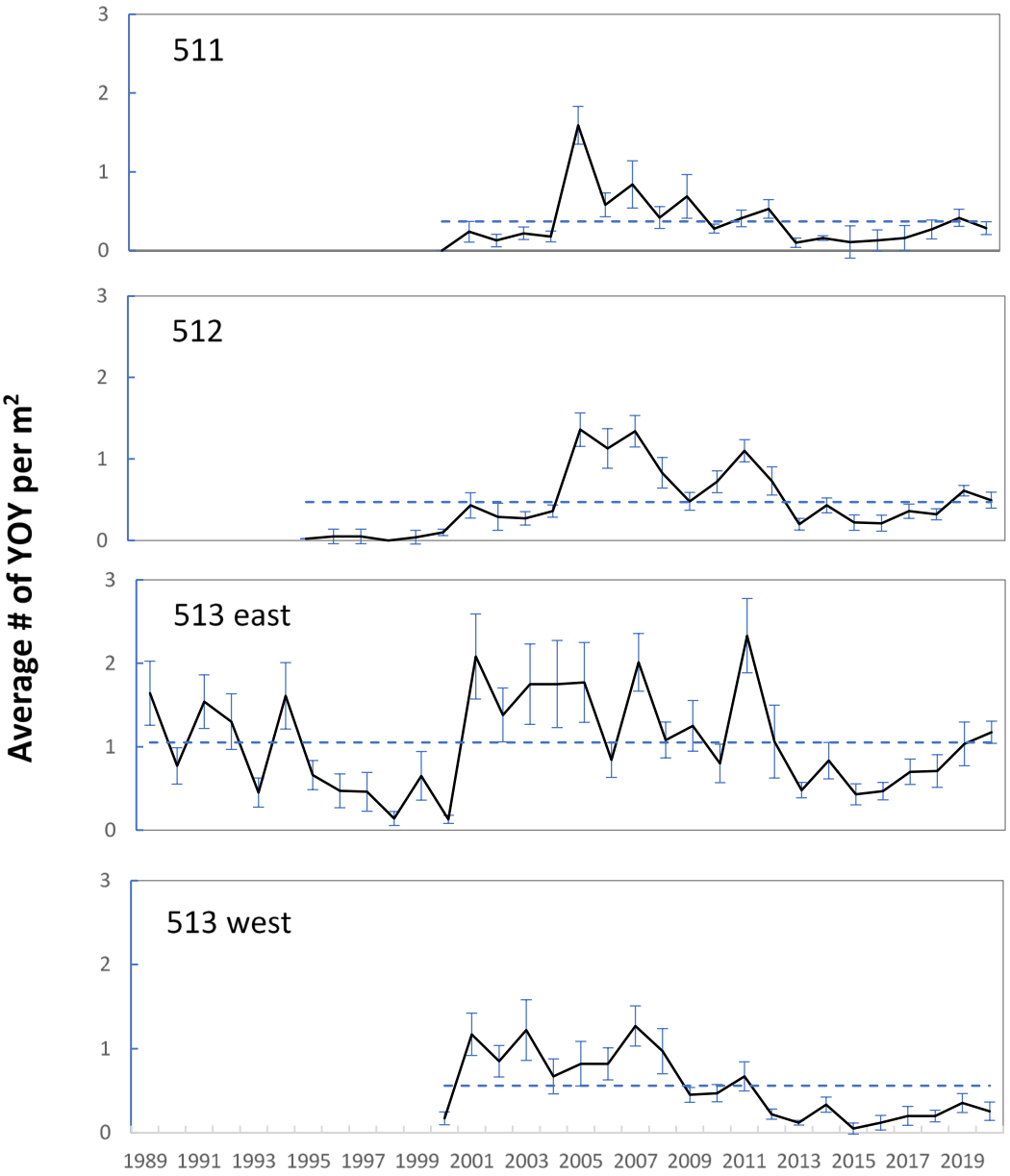

Figure 9. Maine Settlement Survey index 1989-2020 for each statistical area with series average (black line) for each region (blue dashed line) with standard error bars.

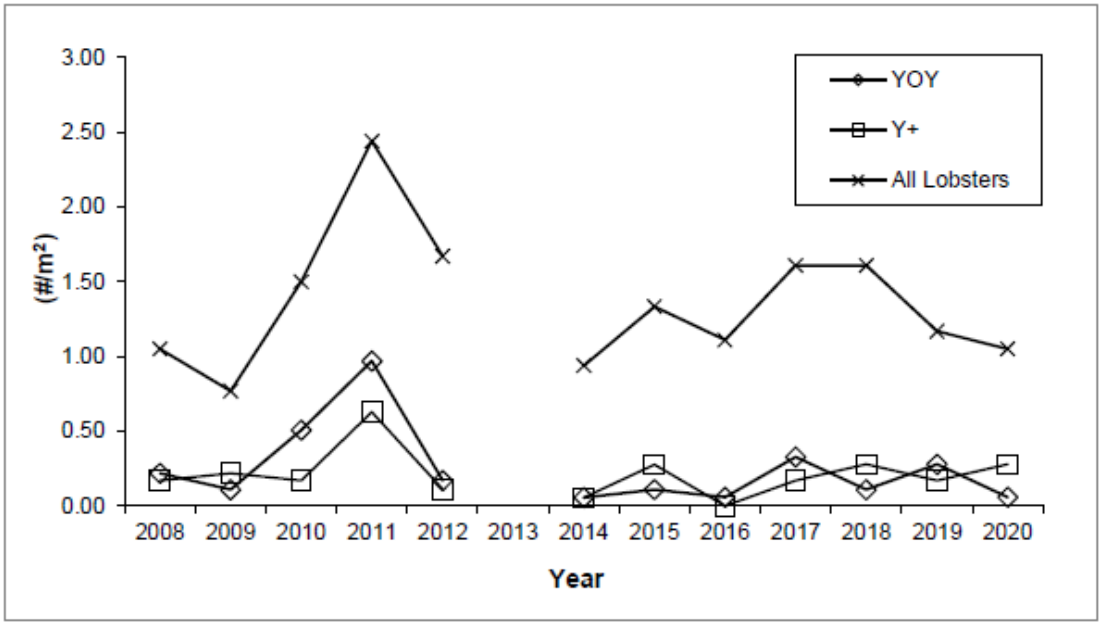

Figure 10. Catch per unit effort (#/m2) of young-of-year (YOY), one-year-olds (Y+), YOY and Y+ combined, and all lobsters during the American Lobster Settlement Index, by location, in New Hampshire, from 2008 through 2020. There were no settlement survey samples collected in NH in 2013.

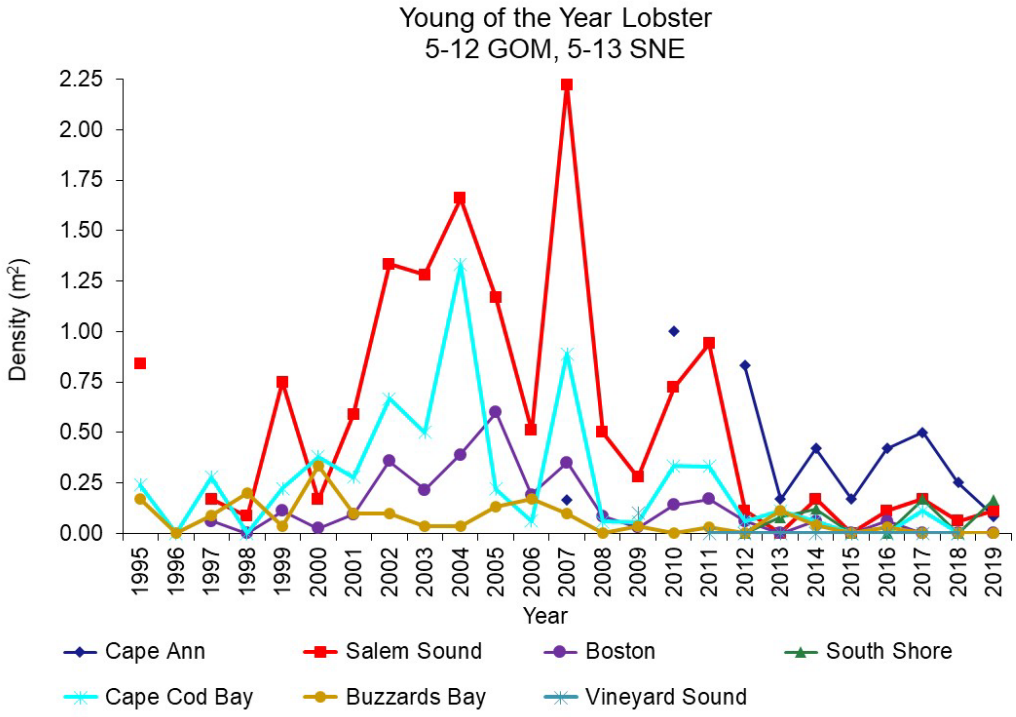

Figure 11. Young-of-year lobster density in seven Massachusetts regions; LCMA 1 – Cape Ann, Salem Sound, Boston, South Shore, Cape Cod Bay, LCMA 2 - Buzzards Bay, Vineyard Sound.

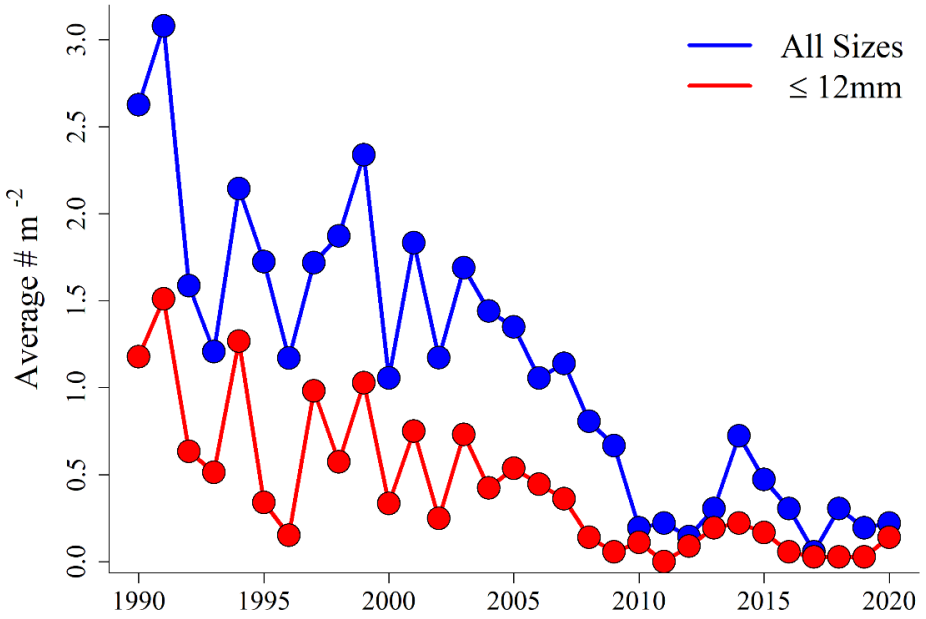

Figure 12. Average abundance of American lobster in Rhode Island suction sampling sites. Abundances are presented for lobsters 12mm and smaller (red line) and all sizes (blue line).

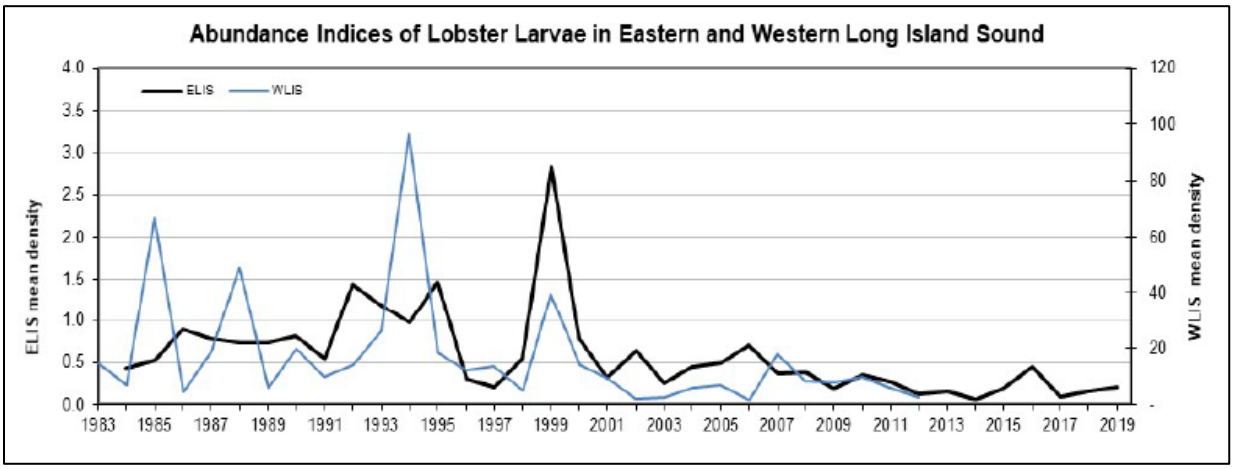

Figure 13. Abundance indices of lobster larvae from the Connecticut DEEP Larval Lobster Survey in western Long Island Sound and from the Millstone Power Station entrainment estimates in eastern Long Island Sound. The Connecticut DEEP survey was discontinued in 2013.

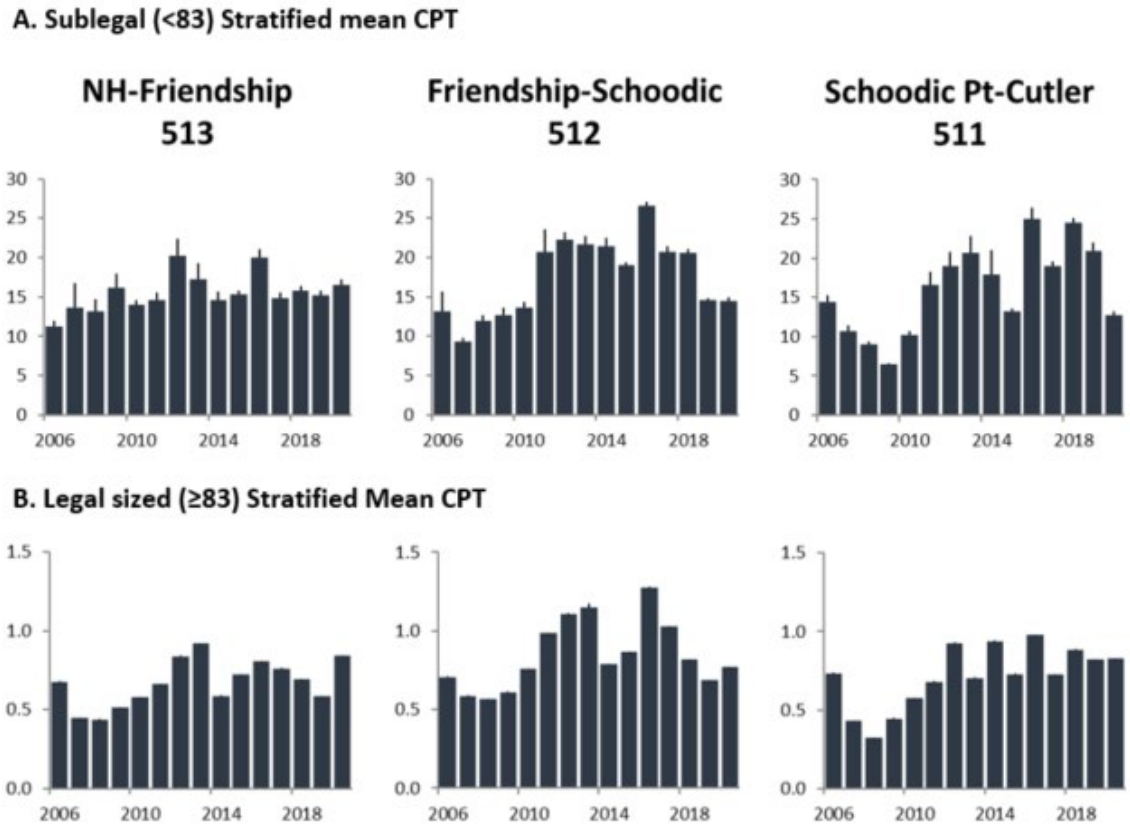

Figure 14. Stratified mean catch per trap for sublegal (A) and legal (B) sized lobsters from Maine's Ventless Trap Survey 2006-2020 by statistical area. Only ventless were traps included in the analysis.

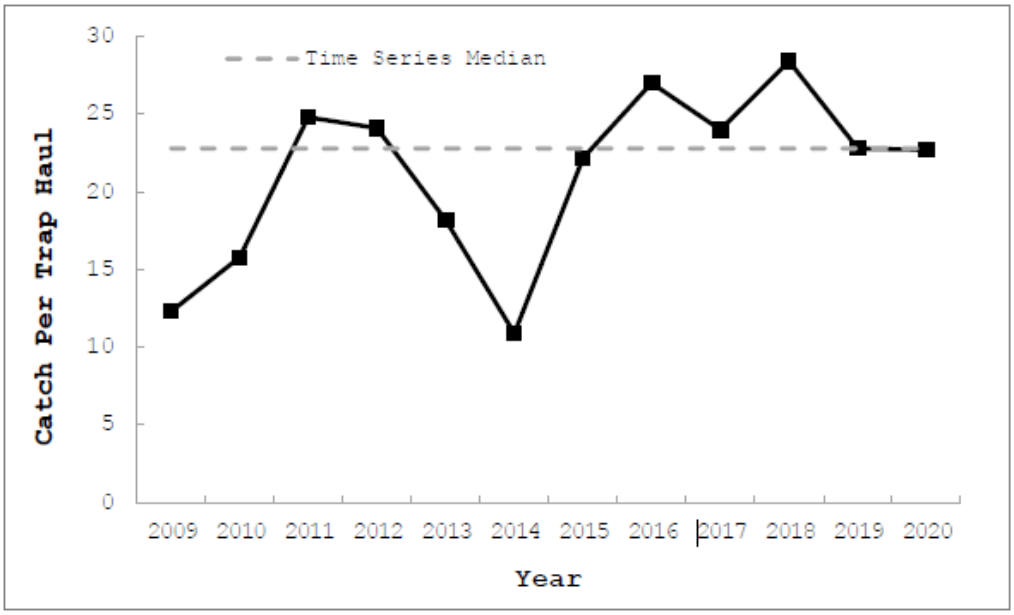

Figure 15. Stratified mean catch per trap haul (ventless traps only) for all lobsters captured during the coast-wide random stratified Ventless Trap Survey in New Hampshire state waters from 2009 through 2020.

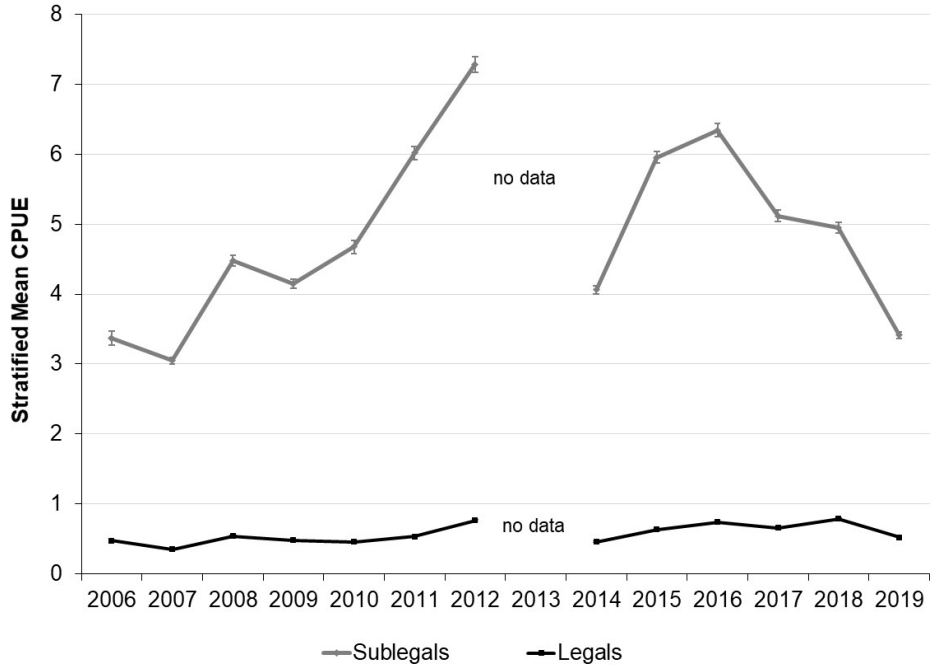

Figure 16. Stratified mean catch per trap haul (±S.E.) of sublegal (< 83 mm, grey line) and legal (≥ 83 mm, black line) lobsters in NMFS Area 514 from MADMF ventless trap survey from 2006-2019. Calculations include both vented and ventless traps.

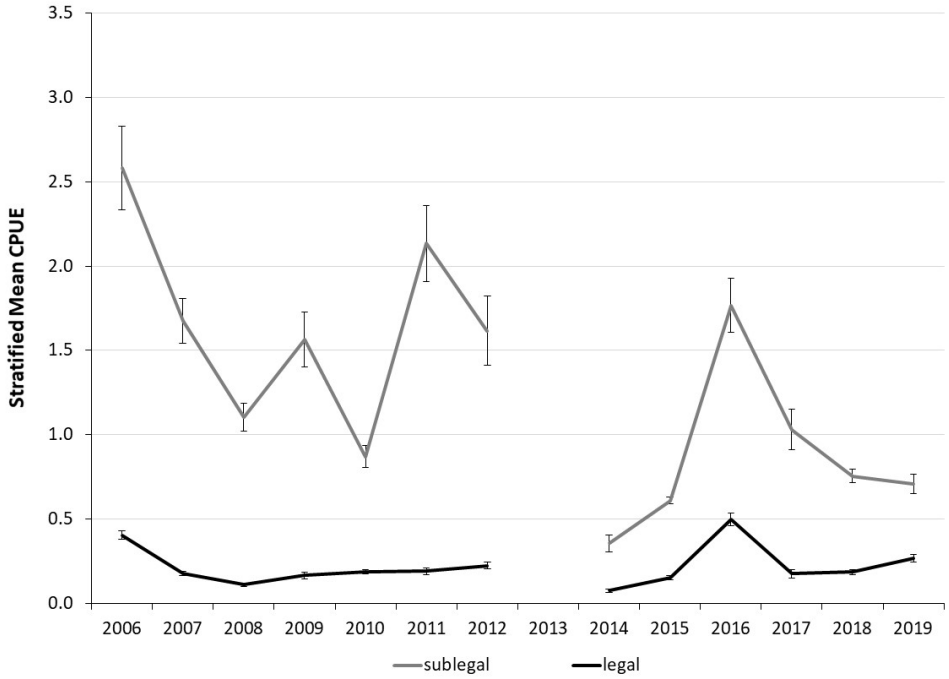

Figure 17. Stratified mean catch per trap haul (±S.E.) of sublegal (< 86 mm, grey line) and legal (≥ 86 mm, black line) lobsters in the original MA SNE survey area (within state waters), Area 538.

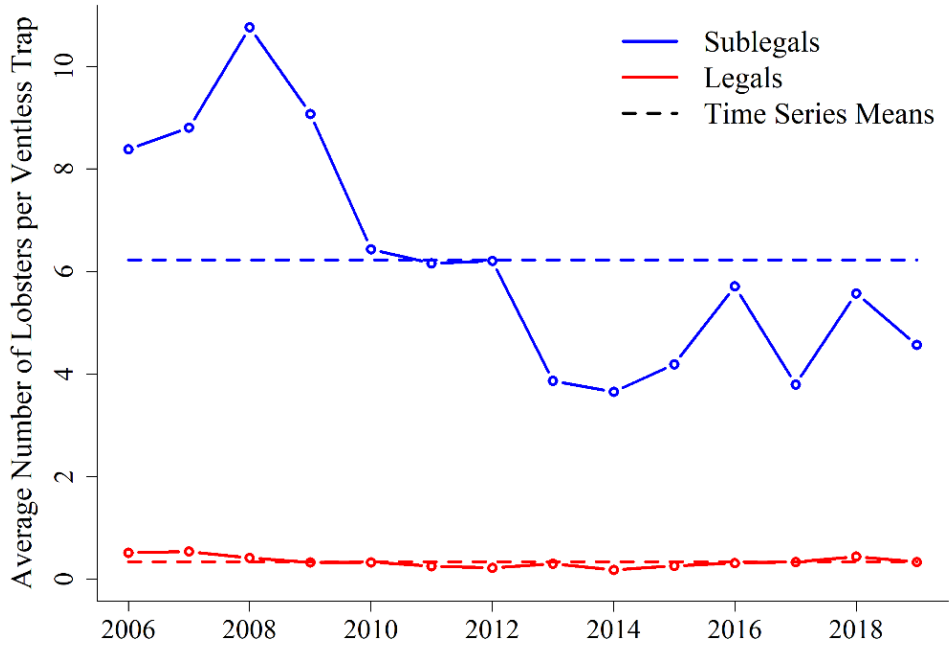

Figure 18. Stratified mean catch (#) per ventless trap for sublegal (<85.725 mm CL) and legal-sized (>=85.725mm CL) lobsters from RIDEM ventless trap survey. The dashed lines indicate time series means for the two indices.