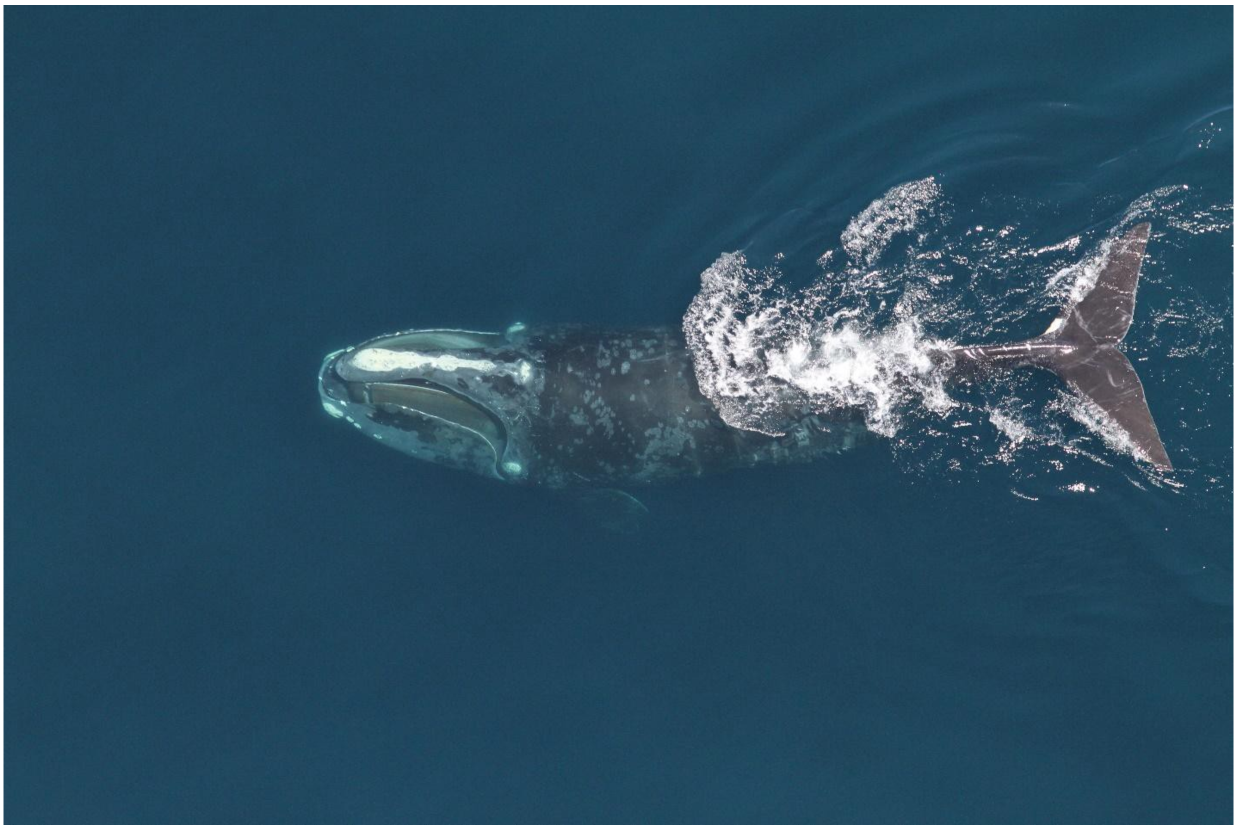
FINAL ENVIRONMENTAL IMPACT STATEMENT,
REGULATORY IMPACT REVIEW, AND
FINAL REGULATORY FLEXIBILITY ANALYSIS
FOR AMENDING
THE ATLANTIC LARGE WHALE TAKE REDUCTION PLAN:
RISK REDUCTION RULE
VOLUME II



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National Marine Fisheries Service National Oceanic and Atmospheric Administration
DEPARTMENT OF COMMERCE

Prepared by: NOAA's National Marine Fisheries Service and Industrial Economics, Incorporated Final EIS: July 2021

<u>RESPONSIBLE AGENCY:</u>

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CHAPTER 1 APPENDICES

Appendix 1.1 Response to Comments on the Proposed Rule and Draft Environmental Impact Statement

1.1.1 Written and Oral Comments

We received 171,213 comments on the Proposed Rule and the Draft Environmental Impact Statement (DEIS) through the comment portal. Of these, six comments from Non-Governmental Organizations were entered as counting for more than one comment:

- Pew Charitable Trusts: 47,699
- Conservation Law Foundation: 1,192
- Humane Society of the U.S: 15,922
- Oceana: 18,440
- Natural Resources Defense Council: 33,045
- Riverkeepers: 4

Four additional comments from Non-Governmental Organization were entered as one comment, but had thousands of signatures attached:

- International Fund for Animal Welfare: 31,912
- Whale and Dolphin Conservation: 3,629
- Environment America: 11,727
- Center for Biological Diversity: 26,594
- Environmental Action: 11,135

All of the above-referenced comments, which represent up to 201,269 people, were in favor of stronger regulations to protect North Atlantic right whales. They strongly favored the following measures: longer and larger restricted areas, increased gear marking, transition to ropeless gear, and a risk reduction target of more than 60 percent. While many were in favor of weak rope or weak link requirements, many also voiced concerns that 1700 lb breaking strength has not been proven to reduce entanglements and could still severely entangle juveniles and calves. In addition, the vast majority urged NMFS to use the most updated population data in setting risk reduction targets and recommended the use of emergency measures to take action immediately.

After accounting for the bulk submissions, we received 53,585 comments uploaded through the regulations.gov portal, as well as 9 comments emailed directly to our office. After running a deduplication analysis, identifying additional campaign emails not detected by the deduplication analysis, and reviewing the entries for double submissions or submissions of supporting documentation separate from the original comment letter, we received approximately 1,076 unique comments that were not clearly part of a coordinated campaign.

Table 1: Stakeholder Groups Represented in Regulations.gov Comments

Stakeholder Group	Number of Unique Commenters
Academic/Scientific	28
Fed Agencies	2
Fed Resource Managers	1

Stakeholder Group	Number of Unique Commenters
Fishery Management Associations	2
Fishing Industry groups	10
Manufacturers	2
NGOs	71
Public	617
Fishermen	300
Other industry	2
State Fishery Resource Managers	7
State/Fed legislators	33
Towns	2
TOTAL	1076

A total of 122 speakers submitted comments orally at public information sessions or public hearings. Many of the speakers submitted more than one comment, and several submitted comments at more than one session. If an individual commented at more than one session, the individual was counted as a unique speaker on each day. We received 2 comments from academic/scientific individuals or organizations, 3 fishing industry associations, 27 non-governmental organizations, 27 members of the public, 59 fishermen, 2 state fishery resource managers, and 2 state/federal legislators.

As many of the speakers who submitted comments orally also submitted comments through the Regulations.gov portal, we considered each individual's comments, both oral and written, as one submission. This gives us a total of 1,129 unique submissions. Combining both written and oral submissions, and excluding duplicates, we received submissions from 28 academic/scientific individuals or organizations, 2 federal agencies, 1 federal resource manager, 2 fishery management associations, 10 fishing industry associations, 2 manufacturers, 76 non-governmental organizations, 628 members of the public, 336 fishermen, 2 representatives from other industries, 33 state/federal legislators, 7 state fishery resource managers, and 2 towns.

Of the 336 unique commenters who identified themselves as fishermen, either directly or through context, 312 voiced opposition to all or part of the rule, 19 commented on particular provisions, but did not expressly support or oppose, and 5 supported the general idea of the rule, though had specific comments on some measures. Of the ten fishing industry groups, eight opposed all or part of the rule, one gave specific recommendations, but did expressly support or oppose, and one supported the general idea of the rule. The primary concerns raised by fishermen are that right whales are not in the areas that they fish and this rule will not protect right whales, but instead will place a large economic burden on fishermen with no benefit for the whales (>147); the economic impact of this rule will put them out of business and devastate coastal communities (>126); and that ropeless fishing is not yet and may never be feasible on a large scale (>105).

Of the 628 unique commenters who identified themselves as members of the public, either directly or through context, the vast majority (534) supported this rule, but expressed the opinion that the rule did not go far enough to protect right whales, with 84 suggesting NMFS use emergency authority to implement immediate protections for whales. Only 54 expressed opposition to the rule. A small number suggested that this rule should be withdrawn because it does not provide adequate levels of protection for right whales, and NMFS should start over.

To summarize, overall, nearly 59 percent of unique commenters supported the Proposed Rule in whole or in part, with the majority expressing the opinion that the proposed regulations should be strengthened to provide more protection to right whales. A little over 34 percent of commenters opposed the rule in whole or in part, and about 4 percent suggested that the rule should be scrapped because it does not provide adequate levels of protection for right whales, and NMFS should start over. About 4 percent of commenters did not express support or opposition, but suggested specific measures or strategies that NMFS should employ. In addition, about 14 percent of commenters (who had either supported the rule or suggested starting over) wanted NMFS to take emergency action.

We received several comments that were outside the scope of the current rulemaking, which are summarized below. The Final Rule and analyses in the Final Environmental Impact Statement (FEIS) are related to amendments to the Plan. The Plan and the take reduction process are restricted to the monitoring and management of incidental mortality and serious injury of marine mammals in U.S. commercial fisheries. Because these comments were out of the scope of the Final Rule and the FEIS, we did not provide responses in this document.

In this Appendix, we summarize the comments received in the topic category, and then provide specific comments and responses to each. Responses may refer to portions of the FEIS or Final Rule that have been modified as a result of comments. We also made changes to the DEIS and the rule in response to the comments, where appropriate, including updates to data where the comments affect the impact analysis. Technical or editorial comments on the DEIS merely pointing out a mistake or missing information were addressed directly in the body of the FEIS and Final Rule.

Below please find our responses to comments. Due to the large number of comments, they are organized according to the following specific topics:

1.1.2. Canada
1.1.3. Economics
1.1.4. Enforcement
1.1.5. Gear Marking
1.1.6. Legal Issues
1.1.7. Line/Effort Reduction
1.1.8. Management
1.1.9. Research
1.1.10. Restricted Areas
1.1.11. Ropeless Gear
1.1.12. Stressors
1.1.13. Trawls
1.1.14. Weak Ropes/Lines
1.1.15. Outside of Scope

1.1.2 Canada

Of the 1,076 unique comments, around 43 suggested that Canadian fishing gear is largely to blame for the recent right whale mortalities and entanglements, and that Canada needs to do more to reduce right whale mortalities and serious injuries. In addition to these commenters, dozens of others felt it was unfair that U.S. fishermen are being asked to make expensive and time-consuming changes to fishing gear and practices, and many questioned NMFS's apportionment of unknown entanglements in determining how much risk reduction was needed to reduce U.S. commercial fishery interactions to the PBR level established under the MMPA.

Comment 1.1: Canadian fishing gear is primarily responsible for recent right whale entanglements and mortalities, not U.S. fishing gear, and NMFS should not attribute 50 percent of the unknown gear to the U.S.

Response: In recent years, gear has only been retrieved from about 54 percent of the detected right whale entanglement events. The majority of the entangling line retrieved is of unknown origin. During 2010-2019, out of 114 documented right whale entanglement incidents, gear was present on 62 whales. Of these, gear could be identified to a country in only 25 incidents (22 percent of all observed incidents): 18 were documented Canadian cases (14 Canadian snow crab, 4 unknown Canadian) and 7 were documented U.S. cases (1 gillnet, 1 lobster, 2 unknown trap, 3 unknown U.S.). The remaining 37 incidents involved gear of unknown origin (6 unknown gillnet/mesh, 1 unknown trap, 30 unknown line). Out of approximately 1.24 million buoy lines within the Northeast waters from Rhode Island to Maine, we estimate that 72 percent of buoy lines were unmarked under current ALWTRP gear marking guidelines although that percentage was reduced when Maine required gear marks on lobster trap buoy lines beginning in September 2020.

It is important to consider that most right whale mortalities are never seen. Entanglement incidents detected in the Gulf of St. Lawrence in recent years from May to early November may reflect some observer bias as the result of the extensive survey effort since late summer 2017 in an enclosed water body. During most of that season, the whereabouts of the two-thirds of the population that were not detected in the Gulf of St. Lawrence remains largely unknown. While acoustic detections indicate that right whales are present in U.S. waters year round, counts of individuals when spread over large areas remain outside of current capabilities but, given Gulf of St. Lawrence counts, the entire population could be present in U.S. waters from December through April and up to two thirds of them could be present year round. U.S. fisheries fish many more buoy lines than Canadian fisheries. That exposure to U.S. fisheries is balanced, however, by the many broad scale gear modifications in place, as well as seasonal restricted areas implemented under the Plan. However lacking an actual estimate of the proportion of the right whale population's exposure to U.S. or Canadian fisheries each year, in 2019 NMFS apportioned unknown mortality using a 50/50 split that recognized that more whales may be exposed over more months to fishing gear in U.S. waters (suggesting higher opportunity for entanglement) but broad based U.S. conservation measures would reduce mortality and serious injury. This apportionment also recognizes that mortality is occurring on both sides of the border, and that U.S. and Canadian measures are needed to reduce human-caused mortality to this transboundary species to recover the population. For more, see FEIS Section 2.1.5.

Comment 1.2: Canada's current regulations are insufficient, as they rely on dynamic management, which could fail due to lack of visual or acoustic detections, and the delay of weak rope implementation until the end of 2022.

Response: Under the MMPA, NMFS is responsible for U.S. fisheries and protected species within our borders and on the high seas. We work closely with our Canadian partners through bilateral meetings, coordinated disentanglement efforts, distribution and abundance data, health assessment, and gear analysis. Since July 2017, Canada has shown a commitment to reduce the impacts of their fisheries on the North Atlantic right whale population and they affirm that commitment in these bilateral efforts. The Canadian Department of Fisheries and Oceans (DFO) is responsible for fisheries management and protected species within their borders, and any concerns about their management measures should be directed to Canada's DFO.

Comment 1.3: Canada and the U.S. should collaborate in monitoring, data collection, and technology development to understand whale movements and sources of mortality, and the U.S. should pressure Canada into doing more.

Response: NMFS coordinates with Canada on right whale conservation and recovery efforts through bilateral discussions and frequent information sharing with the DFO and Transport Canada at both the senior leadership and staff levels. NMFS senior leadership have had discussions with leadership from DFO and Transport Canada on conservation and management efforts for right whales since 2019, and plan to continue these discussions. We also coordinate and cooperate with DFO and Transport Canada through the Canada and United States Bilateral Working Group on North Atlantic Right Whales. This includes discussing lessons learned on fishing and vessel regulations, planning joint scientific activities (e.g., aerial surveys), and coordinating collaboration across all right whale conservation efforts.

Comment 1.4: Maine's Department of Marine Resources should be allowed to participate in all future bilateral meetings with Canada.

Response: The U.S. government routinely conducts bilateral consultations with foreign counterparts on issues of fisheries management. Several of these ongoing consultations are founded in formal collaborative agreements, while others occur through less formal arrangements. Discussions often include sensitive topics, such as respective positions being considered for multilateral organizations. Consequently, such consultations are restricted to federal government personnel.

1.1.3 Economics

Approximately 143 commenters voiced concerns that this rule would cause them extreme economic hardship, with some stating that this rule would put them out of business. Many commenters expressed concern about the effects of this rule on the economic health of their communities, the supply chain, and on the state of Maine. Several questioned NMFS' economic analysis and suggested additional factors to consider in the economic analysis. Others were concerned that economics inappropriately and illegally dictated the alternatives considered in this rule; see the Legal Issues section for responses to those comments.

Comment 2.1: The new regulations will drive up costs, making fishermen unable to compete with Canada, resulting in the loss of an iconic U.S. fishery.

Response: Under the Fish and Fish Product Import Provisions of the MMPA published on August 15, 2016 (81 FR 54389), fish and fish products from fisheries identified by the NOAA Assistant Administrator in the List of Foreign Fisheries can only be imported into the United States if the harvesting nation has applied for and received a comparability finding from NMFS. Nations have until November 30, 2021, to apply for Comparability Findings for their fisheries. Beginning January 1, 2023, all nations seeking to continue exporting fish and fish products to the United States must have received Comparability Findings. Beginning in 2023, Canadian lobster and snow crab fisheries will face similar conservation costs for large whale protection if they wish to enter the U.S. seafood market. The new regulations are intended to even the playing field.

Comment 2.2: NMFS underestimated the economic costs of the LMA1 seasonal restricted area because it did not take into account; (1) total affected vessels, (2) displacement of effort from those vessels, (3) changes in value to landings.

Response: Based on the comments received, we identified new and updated data sources and have revised our estimation methods. In the DEIS, we relied on the Industrial Economics (IEc) model vessel data and calculated catch per trap using NMFS Vessel Trip Report data. Because only about 10 percent of Maine vessels provide trip reports annually, these data may not have reflected the catch rates and landings achieved by vessels fishing in the seasonal restricted areas. Due to public comments, we updated the analysis using Maine Department of Marine Resources (Maine DMR) harvester and dealer report data to re-estimate the total landings outside 12 nm. Please see FEIS Section 6.3.4.1 for details.

Further, not all landings would be lost when the restricted area is in place. Fishermen are expected to relocate their gear to fishing grounds within the same or directly adjacent Maine lobster management zones. As fishermen commented, vessels already fishing in those adjacent fishing grounds would then be crowded, reducing their catch rates. We have included the crowding effects to other vessels in the surrounding areas in our economic calculations in the FEIS. We also assume a 5-10 percent reduction rate based on the natural lobster mortality rate. Nearly all the lobsters not caught during the restricted area closure are assumed to be caught at other locations or later in the year. Looking at the industry as a whole, the lost value to the entire fleet would be those lobsters dying from natural causes.

In Table 6.12, as one commenter noted, we had incorrect information on the lobster price unit leading to an error in the landings values. The prices displayed in the table are in dollars per pound but should have been calculated as dollars per kilogram. However, the costs in the last two columns are still correct, as they were calculated separately using pounds.

Comment 2.3: NMFS should include the potential benefit of reducing the need for disentanglement efforts in the economic effects analysis. We ask NMFS to evaluate the annual average costs of retaining each disentanglement team, including its equipment, insurance requirements, and staff.

Response: We agree that we should consider this in our economic analysis, and have revised our analysis to include an estimate of disentanglement costs as well as the potential benefit of reducing the need for disentanglement efforts. See the qualitative and quantitative discussion in FEIS Section 9.6.4.

Comment 2.4: The DEIS does not analyze the economic benefits of ropeless fishing.

Response: This rule does not require fishermen to fish with "ropeless" fishing gear. However, in response to commenters, we added some analysis of the economic costs and benefits of ropeless fishing to FEIS Section 6.3.3, and some details of anticipated impacts can be found in response to comments below in response to Comment 9.4.

Comment 2.5: The Proposed Rule fails to account for the full benefits of weakening vertical lines to reduce mortality and serious injury from entanglements. The full benefits should be taken into account in the development of a final rule.

Response: All cases where full weak rope was not implemented were analyzed according to the proportional risk reduction of the number of inserts compared to the equivalent of full weak rope (an insert every 40 feet). Please see FEIS Section 3.3.4 and 5.3.1.3 for a description of how the use of weak rope was analyzed and the anticipated impacts on large whales. FEIS

Sections 5.3.2.3 and 5.3.4.3 discuss the expected impacts on other protected species and protected habitat.

Comment 2.6: NMFS should consider the costs already incurred under previous take reduction measures, and the effectiveness of those measures, and should standardize a review of its economic analysis based on the actual impact of previous rules.

Response: In the FEIS, we revised our analysis to provide as much information as possible about the costs already incurred under previous take reduction measures. However, these economic impacts are not directly related to current rulemaking, so would not be included in the final costs. Under Section 610 of the Regulatory Flexibility Act, NMFS is required to review any significant rule to evaluate the continued need for regulation. Our review procedures include a summary of the expected economic impacts contained in the Final Rule, as well as a summary of any changes in technology or economic conditions that may have occurred since. To allow for sufficient time for economic adjustments to occur and for data to become available, we review rules every seven years. The most recent ALWTRP rule was published in 2015, and will be coming up for review shortly.

Comment 2.7: Did economic analysis take into account fishermen from outside Maine, New Hampshire, Massachusetts, and Rhode Island, as there are some fishermen from New York and Connecticut that may be affected?

Response: This rulemaking applies to lobster and Jonah crab fisheries in the Northeast Region Trap/Pot Management Area (Northeast Region). Please see FEIS Chapter 1 for the regulated waters map. In the DEIS, we only included fishermen from Maine to Rhode Island. In the FEIS, we identified a few New York fishermen that fished within the regulated area and we revised our analysis to include the economic impacts to those lobster and Jonah crab fishermen. No Connecticut fishermen were identified in the regulated waters. Due to data confidentiality requirements, those New York fishermen were combined with Rhode Island LMA 2 vessels and LMA 3 vessels in the analysis.

Comment 2.8: This rule will drive small fishermen out, and the fleet will become consolidated into larger corporate operations, destroying iconic tourist-drawing fishing communities and resulting in cultural loss.

Response: A number of the measures including trawling up and weak insertion requirements were initially developed by Maine DMR after extensive outreach with Maine fishermen. Fishermen indicated that the trawling up and weak insertion measures could be done by reconfiguring existing trawls and buoy lines, reducing impacts of wholesale replacement of gear. Based on recommendations from the public, fishermen and state agencies, we have modified the alternatives in the FEIS to include conservation equivalencies in Southern New England, LMA 3, and Maine Lobster Management Zones out to 12 miles. As requested by Rhode Island fishermen and supported by the State, we analyzed the use of weak rope instead of trawling up measures for LMA 2. Fishermen indicated they could not support longer trawls unless they invested in a new vessel or vessel modifications. An analysis of risk reduction determined that this provided equal or better risk reduction. The Final Rule applies weak rope measures identical to the Massachusetts state measures for LMA 2 and does not require further trawling up. Similar concerns expressed by LMA 3 fishermen resulted in the implementation of trawling up restricted areas with varying trawling up requirements. Conservation equivalency measures provided by Maine fishermen and Maine DMR allow fishermen to choose between different trawl lengths with one or two buoy lines, or use more weak inserts instead of trawling up based on fishing practices in the Maine lobster management zones.

Comment 2.9: Does the economic analysis of gear conversion take into account the replacement savings of current gear that is nearing the end of its lifespan?

Response: We have revised our analysis to include this in the FEIS. Since it is difficult to estimate the life stages for all gears in the regulated areas, we applied new gear prices for current gear requirements in the DEIS.

When vessels modify their gear configurations by trawling-up to add more traps between trawls, they can save some gear costs from the reduction in surface system like buoy lines, buoys and radar reflectors. These savings are calculated using new gear prices.

For weak rope measures, in Alternative 2 (Preferred) and the Final Rule, weak rope can be inserted into current ropes, so no large-scale replacement of buoy lines is needed. Estimated costs of inserts assume the rope or sleeve is new. In Alternative 3, which requires fully engineered weak rope to replace the current rope, the compliance costs would be the difference between fully weak rope and regular rope. We also use new gear prices for both ropes.

Comment 2.10: Fishermen should be compensated for the time it takes to mark all the gear.

Response: Currently there is no mechanism by which NMFS is able to compensate fishermen for gear marking costs. A program of that nature would require Congressional appropriations. Similar programs have been made available to fishermen in the past. Note that effective gear marking could help fishermen and the government avoid additional regulatory burden in the future by better identifying areas where interactions are likely and unlikely to occur.

Comment 2.11: The costs of lost gear from new weak rope requirements should have been considered in the evaluation of economic effects.

Response: We discussed this issue qualitatively in FEIS Section 6.2.6.1.

Comment 2.12: The economic impacts of gear marking, including the time already spent marking gear, should have been included in the economic impact analysis because the rules were implemented in direct anticipation of the Proposed Rule.

Response: Other than the gear marking costs for fishermen fishing within Maine Exempt waters, who will be regulated by the state of Maine, we revised the analysis to include estimates of the gear marking costs (both material and labor costs). This revision is in response to public comments correctly noting that Maine implemented gear marking measures in anticipation of this Final Rule. However, improved information regarding the location of large whale entanglement related mortalities and serious injuries may allow future tailoring and reduced economic impacts of regulations.

Comment 2.13: The evaluation of the economic effects of this rule should have included all parts of the supply chain, such as lobster processors, dealers, gear suppliers, trap builders, rope and line manufacturers, and restaurateurs.

Response: We quantitatively evaluated the economic impact of the Final Rule as it applies to the lobster and Jonah crab trap/pot fisheries in the Northeast. We recognize that these changes could impact the broader supply chain, as well as local communities and economies in ways that are not easily quantifiable. In FEIS Section 6.7.2.2, we include a qualitative evaluation of the socioeconomic impacts to fishing communities.

Comment 2.14: Fishermen should get economic assistance/subsidies to cover the costs of gear changes and lost revenue.

Response: Given the vast amount of industry input into the development of weak insertions, which would not require fishermen to replace buoy lines, and trawling up measures, many gear modifications implemented in the Final Rule were created to control costs. However, the economic analysis in Chapter 6 indicates the first-year cost of this rulemaking is $9.8 to $19.2 million, which is 3 percent of the landings value of the lobster fishery in 2019. Some of those costs are likely to be passed on to the consumer but economic impacts to fishermen are anticipated.

NOAA reprogrammed some funds to support fishermen in complying with gear modification changes, but at this time funds have not been appropriated by Congress or further reprogrammed to reimburse fishermen. In December 2019, $1.6 million in federal funds were reprogrammed to support recovery actions for the North Atlantic right whale in the lobster/Jonah crab trap/pot fishery. The funds were made available to fishermen through our partnership with the Atlantic States Marine Fisheries Commission (Commission). The funds were obligated to the Commission and have been distributed to Maine, New Hampshire, Massachusetts, and Rhode Island to assist the lobster/Jonah crab trap/pot fishery in adapting to and comply with the measures in this Final Rule and to help defray costs to support affected fishermen broadly.

Comment 2.15: NMFS should reevaluate the use of Automatic Identification Systems (AIS) to track vessel locations and movements, and not dismiss it from consideration as an alternative based on expense.

Response: NMFS supports the collection of high-resolution spatial data in the lobster fishery and intends to continue to work with the Commission, through their technical working group, to develop data collection objectives and requirements, while balancing the financial burden to industry. Included in ongoing discussions are specifications needed to determine whether options less expensive than AIS systems can be used effectively. A basic vessel tracking system costs between $500 and $1,300, while a more advanced AIS system costs between $750 and $3,500. AIS devices also have ongoing operating costs. In relation to the overall size and value of the lobster fishery (approximately $600 million), for example, the cost of vessel tracking technology is small in light of the benefits it provides in the form of real-time fishery monitoring as well as safety to prevent vessel collisions. We anticipate continued investigation into the appropriate vessel tracking specifications to meet the needs for lobster and right whale management and, if appropriate, would pursue rulemaking within the next few years to require vessel tracking for federally permitted vessels fishing for lobster.

Many lobster vessels are smaller than 65 feet and therefore not currently required by law to carry AIS. While the individual cost of AIS systems are low compared to the value of the fishery, outfitting the entire fleet with AIS would not be a cost effective approach to monitoring, due to the trap-setting nature of the fishery. Other vessel tracking methods are being piloted by the Commission that are more responsive to tracking the movements of lobster boats, such as setting and hauling back. NMFS will work with them to regulate this monitoring approach.

Comment 2.16: In doing its economic analysis, NMFS did not consider the ecological value of right whales, and the role they play in a healthy environment, including their role in carbon sequestration.

Response: In Section 9.6.1 of the DEIS, we discussed the value of large whale protection in non-consumptive use benefits and non-use benefits. We provided the total expenditure of the whale watching industry as a proxy for non-consumption use value, and we provided a list of research results on the willingness to pay for whale protection programs from society as a proxy for the non-use value. In FEIS Section 9.6, we revised our analysis to include recent studies on the ecological and economic value of large whales.

Comment 2.17: The DEIS does not include a reference to the Meyers and Moore 2020 paper that suggests a reduction in effort brought about by time/area closures and removals of traps and lines from the water may reduce costs.

Response: When we prepared the DEIS in spring 2020, this Meyers and Moore (2020) paper had not yet been published. We have updated the FEIS and this paper has been cited. See FEIS Section 6.5.1.

Comment 2.18: The economic and social impacts analysis fails to consider the impact that the ongoing COVID-19 pandemic has had on demand for the fisheries. In the first six months of 2020, U.S. exports of lobster declined by 44.6 percent (FAO Globefish 2021) and that significant uncertainty regarding the duration and extent of these impacts remains.

Response: The full consequences of COVID-19 on the U.S. lobster and Jonah crab trap/pot fisheries cannot yet be determined. In the first half of 2020, the U.S. fishing and seafood sector experienced broad declines due to COVID-19 protective measures instituted in March 2020 across the United States. While lobster fishing effort and demand for lobster were low in the first half of 2020, landings increased and prices rose as the year went on. Maine, the state that has the most active and valuable lobster fishery, reported preliminary data that indicated that the value of lobster landings in 2020 exceeded $400 million for only the seventh time (Maine DMR constituent email, March 24, 2021). The catch volume was reportedly 5 percent lower than 2019 landings but the vessel price was $0.44 higher per pound than the average price over the previous ten years. While the uncertainty caused by COVID-19 on communities that rely on lobster and other fisheries cannot be understated, in the Gulf of Maine, where lobster stocks are healthy, the fishery appears to be somewhat resilient.

Comment 2.19: The costs of compliance fail to account for economic losses associated with shorter equipment durability and lifespan caused by the proposed weak ropes, insertions, and trawling up.

Response: See the description of gear loss costs in Chapter 6, section 6.2.6.1. Gear loss is not included in the final costs estimation because the effect of trawling up on gear loss is unclear and not thought to be substantial. We also currently have no evidence that weak rope or weak inserts would cause significantly more gear loss. In a study of weak inserts conducted by New England Aquarium for the Massachusetts Office of Energy and Environmental Affairs, Knowlton et al. (2018) documented sleeves designed with reduced breaking strength breaking in only 11.8 percent of hauls relative to 8.5 percent of control buoy lines, which they did not find statistically significant. Some fishermen who have used the South Shore Sleeves for several years have incurred no significant increase in extra gear loss. NMFS will continue to test and evaluate the use of weak inserts to ensure they are not likely to contribute to an increase in ghost gear. See Section 5.3.1.3.2 for a description of the anticipated indirect effects of trawl length and weak rope measures, including the likelihood of gear loss. Also note that lobster landings dropped in 2020 due to COVID-19 but the 2020 lobster average price was the second highest in the past decade, about $4.4/lb.

Comment 2.20: The DEIS exclusively uses the federal dealer data to analyze the commercial impact to the industry, not the full value of the supply chain, and so underestimates the true cost.

Response: For our analysis of the impacts on commercial fisheries, the dealer data provides the most accurate information. Although we have some information of the total economic value of the supply chain in Maine, it is difficult to estimate the impacts of the proposed rule on it. The biggest impact on the supply chain from the rulemaking would be the short-term landing reduction. There could be some negative impacts in the near term, but also could benefit the industry in the long run. We discussed this issue briefly in FEIS Section 6.7.2.2.

Comment 2.20: NMFS's economic analysis fails to properly consider that reduced effort does not equate to reduced catch.

Response: For reduced effort in restricted areas, under the scenario where fishing is suspended, we assumed fishermen would lose all their revenue during the closed fishing period, which was the more conservative estimate. We recognize the costs could be overestimated in section 6.3.1.2 "Caveats". Under the scenario where effort is relocated, we assumed a 5% to 10% landing reduction in the first year, and we also applied a decreasing rate of landing reduction for the impacts of restricted areas.

1.1.4 Enforcement

About 14 commenters voiced concerns that this rule would be difficult to enforce, and 11 commenters including the U.S. Coast Guard, suggested that NMFS needs to develop a comprehensive enforcement plan for the areas affected by this rule. As noted in the FEIS, lobster trap/pot gear makes up the vast majority of buoy lines fished in the Northeast Region, making compliance with regulations paramount to the rule's ultimate success or failure in reducing right whale mortalities and serious injuries.

Comment 3.1: NMFS should develop a comprehensive monitoring and enforcement plan to ensure compliance. One commenter stated that there is currently no enforcement in Massachusetts, New Hampshire, and LMA 3, and another stressed the importance of including states in the development of any enforcement plan.

Response: State partnerships serve a significant role in effective regional enforcement activities. The Office of Law Enforcement-Northeast Division (OLE-NED) has Joint Enforcement Agreements (JEA) in place with ten New England and Mid-Atlantic Coastal States (Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, and Virginia). The following states perform inspections of lobster gear in Lobster Management Areas: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey. The following states perform inspections of black-sea-bass gear in Lobster Management Areas: Delaware, Maryland, and Virginia. OLE-NED has developed and implemented a pilot program using remotely operated vehicles (ROVs) to inspect offshore fishing gear, including in LMA 3. The pilot project will inform future offshore enforcement activities for ALWTRP compliance monitoring efforts Additional information on this pilot program is provided in response to Comment 3.2. OLE-NED has identified a number of elements to review, in partnership with the states and the U.S. Coast Guard, to help develop a more comprehensive enforcement strategy for the ALWTRP regulatory requirements. Appendix 3.5 of the FEIS provides a high-level overview of compliance monitoring plans and associated enforcement assets.

Comment 3.2: Several commenters noted that enforcement in the offshore areas, particularly LMA 3, is sparse, and question whether Marine Patrol will be able to do gear inspections on longer trawls.

Response: Traditional methods of hauling gear in offshore waters for compliance monitoring poses both safety and sustainability challenges. To meet these challenges, OLE-NED developed and implemented a pilot program using ROVs to inspect offshore fishing gear. OLE-NED has conducted offshore subsurface ROV surveys to check for sinking groundlines, gear markings, and weak links in previously uninspected areas. Gear tags were also inspected when possible. After initial trials, OLE has determined that ROV-based inspection of gear in the water is a safer and more efficient way to enforce offshore lobster gear requirements, rather than physically pulling the gear. The pilot project was carried out in FY2020 and FY2021, and will inform future offshore enforcement activities for ALWTRP compliance monitoring efforts.

Comment 3.3: How will NMFS be able to enforce the different requirements in different areas, as fishermen move from area to area?

Response: NOAA's Office of Law Enforcement partners with state agencies and the U.S. Coast Guard to enforce all applicable lobster regulations nearshore and offshore. Fishermen are required to adhere to the regulations in the areas they fish. In Maine Lobster Management Zones, where conservation equivalencies established by zone and distance from shore present the greatest enforcement challenge, the Maine Marine Patrol assured us that they use outreach, education, and enforcement to establish and maximize compliance, are very familiar with Maine's lobster management zones and boundaries, and that ". . .enforcement of most restrictive rules relative to lobster zones does not present any significant challenge. . ." (email from Erin Summers, April 20, 2021). Offshore enforcement poses challenges that enforcement partners have been evaluating in recent years. While OLE does not disclose specific law enforcement techniques, as discussed above, OLE has started deploying ROVs to inspect offshore gear. OLE welcomes and encourages the public to report violations to their hotline.

1.1.5 Gear Marking

A total of 75 commenters supported gear marking, indicating that gear marking is the best way to determine where and in which fisheries entanglements occur, and potentially absolving other areas and fisheries of blame. Gear marking was universally supported by conservationists and fishermen. Several Maine fishermen commented that they had already completed their required gear marking, and many are expecting the results to show that Maine's lobster fishery does not entangle whales.

Comment 4.1 NMFS should give Maine's lobster fishery a three-year evaluation period to make sure that Maine's rope (now with purple marks) is not causing entanglements before adding any other requirements.

Response: The results of Pace et al. 2021 show that in the years 1990-2009, roughly eight right whales per year died, many unseen. Since 2010, on average 21 right whales per year have died. Recent observations indicate that the increase in mortality since 2010 is in part due to a significant amount of mortality in Canadian waters and/or from Canadian fishing gear. However, the sources of the unseen mortality (roughly eight whales per year) that has existed for decades remains uncertain and the effects of the Plan's measures cannot be evaluated (Pace et a.. 2017) and likely has not reduced mortality and serious injury below one per year as required to meet MMPA goals.

If current trends continue, even accounting for a mean of 11 births per year over the last 10 years, we could expect to lose another 30 whales over the next 3 years, or 10 whales per year. Pace et al. (2021) estimates that approximately 368 right whales were alive at the end of 2019. At the current rate of decline, we would expect the 2020 population to be 358. If we wait 3 more years to implement risk reduction regulations, the population could be as low as 328. We are required by the MMPA to take action now. See FEIS Chapter 1 for more information on the need for immediate action.

We expect gear marking and acoustic and aerial surveys to help us further identify the areas of most risk to right whales. Until we have additional information, we must regulate based on the best available science: Maine has the highest concentration of all vertical line gear in U.S. waters, and right whales are still using Maine waters.

Comment 4.2: There should be an exemption for hand-hauled lobster traps in less than 100 feet of water, because when traps are pulled by hand, the vertical lines are not cleared of organisms on the rope as they would be when a pot hauler is used**.**

Response: It is unclear what exemption is being requested by the commenter but this exemption was not included in the Final Rule. The request may be for an exemption from gear marking requirements because marks may be obscured by fouling. While this may reduce the ability to see marks from a vessel, gear marks would be detectable from line retrieved from a whale.

Comment 4.3: We received comments from some who support the idea of individual ID tags that would allow NMFS to identify the fisherman whose gear entangles a whale, as well as from others who oppose individual ID tags.

Response: Current regulations require buoys to be marked with information that can be traced back to individual fishermen. Buoy and individual line tagging technologies exist, but this method of marking comes at some cost and the benefits are unclear. Gear is not always recovered and often buoys or traps are not present on the entangled whale. Line marking technology, such as identification tape (i.e., marker tape) that is woven into line, is expensive and is difficult to enforce without severing the buoy rope. Radio frequency identification and passive integrated transponder tags are also expensive, require standardized tag readers to adequately enforce, and in field trials have not held up well in commercial fishing conditions. As the technology improves and the costs are reduced, NMFS will continue to monitor the possibility of line identification tape. We are not requiring individual markings in this rulemaking.

Comment 4.4: One commenter proposed dividing Massachusetts and Maine into smaller subdivisions with distinct markers to allow NMFS to develop more accurate and targeted marine policy, and another suggested weak rope should be marked or colored to identify it as weak rope.

Response: Current regulations include some small zones of multiple colored marks but given the rarity of gear retrieval, the value of small area marking requirements is not yet proven. Gear marking is one of the most expensive elements within the proposed regulations and increasing complexity adds expense without proven benefits or any risk reduction. Regarding requiring weak rope to be identifiable with a color or marking scheme, NMFS does not regulate rope manufacturers. However, we are asking them to create intentionally engineered weak rope with a tracer or a strand of a contrasting color. Weak insertion approval has included a requirement of a contrasting color to allow both enforcement and disentanglement teams to recognize the weak insertion.

Comment 4.5: NMFS should not require any additional gear marking beyond what is already in place.

Response: Currently, the majority of gear recovered has no identifiable marks and until Maine established gear marking requirements in Maine exempted waters, over half of all U.S. buoy lines were unmarked. In order for the ALWTRT to make better recommendations, including those that could allow more targeted gear modifications and closures, the Team needs a better understanding of the types and locations of rope that entangle whales. The more robust gear marking scheme included in the Final Rule, including some markings largely supported by the ALWTRT and states, should increase our ability to identify the gear, and subsequently, identify more targeted and more effective measures to reduce entanglements.

Comment 4.6: Gear marking should be required for all fisheries in the right whale migratory path.

Response: The ALWTRP covers commercial fisheries within the right whale migratory path from Florida to Maine. While, historically, the majority of gear recovered from right whale entanglements has been unknown, state regulations and the Final Rule expand the gear marking schemes substantially for the lobster/Jonah crab fishery, which contributes the vast majority of vertical lines in these waters. The new gear marking requirements should increase the frequency with which we encounter gear marks on recovered rope from entanglements and enable visual identification of state of origin from aerial and vessel-based platforms. The ALWTRT has begun meeting to develop recommendations related to reducing the risks posed by other U.S. fisheries in right whales range. In recent years, Canada has also implemented gear marking requirements for Canadian lobster and snow crab fisheries.

Comment 4.7: NMFS should require gear markings every 17 fathoms, so that gear markings will be at the same intervals regardless of the total length of the rope.

Response: The large number of different fisheries operating at various depths managed under the ALWTRP makes it difficult to implement a single gear marking structure. For those fisheries occurring in deep offshore waters, this rule more than doubles current gear marking requirements but may not result in marks as frequent as every 17 fathoms (31 meters). However given the large number of buoy lines in shallower waters, one marking every 17 fathoms (31 meters) would be a reduction in gear marking compared to what we have in the Final Rule.

Comment 4.8: Several commenters suggested that sinking groundlines should be marked to distinguish them from vertical lines, while others supported not requiring any gear marking on sinking groundlines.

Response: Groundline marking has not been extensively discussed by the ALWTRT in recent years. Under current ALWTRP and in this Final Rule, no gear marking will be required for sinking ground lines.

Comment 4.9: Why are the gear marks required to be 3 feet long (0.91 meters), and would that be useful in murky water?

Response: Gear marking and fishery identification relies mainly on recovering gear from entangled whales, making the water clarity a negligible component of gear identification. However, the proposed larger 3-foot (0.91 meter) mark within 2 fathoms (3.65 meters) of the surface system should help identify gear from vessel and aerial platforms, as the surface system will keep the line in relatively clear water. The mark could also provide useful information for disentanglement teams, and may allow gear identification in cases where whales are photographed, but not seen again.

Comment 4.10: Any Final Rule should include requirements for all buoy lines to be marked the full length of the vertical line, or at the very least, markings every 40 feet, and in such a way that the location of where gear was set can be known even in cases when a buoy is not seen or retrieved.

Response: The Final Rule increases the number of marks with additional distinction between federal and state waters, offering better spatial resolution than those in the Proposed Rule. The marks will also be longer in length to increase the likelihood that a mark will be spotted without a buoy. However, it was determined that marking every 40 feet would be costly without a commensurate benefit given that since 2010 gear has only been retrieved from about 40% of the observed right whale entanglements.

Comment 4.11: Time consuming gear marking regulations should be implemented during the off season, as otherwise gear making will reduce the time available for fishing.

Response: We recognize this issue, and this rule will include a delayed implementation date to allow time during slow seasons as practicable for gear configuration and gear marking changes.

Comment 4.12: Can we alert whales to the presence of ropes with visual or acoustic cues?

Response: Research conducted by Kraus, Fasick, Werner and McFarron (2014), and Kraus and Hagbloom (2016), suggested that red and orange lines may be visually detectable by North Atlantic right whales at greater distances than other colors although it is unclear to what depths color can be detected or whether detection results in avoidance. For more information on gear marking measures included in this rule, please see Table 3.3. Unlike toothed whales that use echolocation to sense their surroundings, baleen whales like right whales are not detecting fishing gear acoustically and acoustic cues are unlikely to result in gear avoidance in the same way that pingers have been successful at reducing entanglements of harbor porpoises, for example.

1.1.6 Legal Issues

Approximately 28 commenters believe that the Proposed Rule violated the requirements of the MMPA, the ESA, the National Environmental Policy Act (NEPA), and/or the Administrative Procedure Act (APA). Most of these concerns were raised by NGOs, including but not limited to: Whale and Dolphin Conservation, Oceana, Center for Biological Diversity, Conservation Law Foundation, Defenders of Wildlife, Humane Society of the U.S., Natural Resources Defense Council, PEER, Clearwater Marine Aquarium, Georgia Aquarium, Southern Environmental Law Center, as well as the Maine Lobstering Union, and many federal and state legislators.

Comment 5.1: NMFS refusal to evaluate some strategies, including but not limited to certain trap reductions, weak line enhancements, static area closures, and gear marking strategies, was "arbitrary and capricious" under the APA.

Response: The development of the Proposed Rule was the result of an extensive public process involving challenging negotiations within the ALWTRT and ample opportunity for public input as prescribed by the MMPA, NEPA, and the APA.

Many options were considered, deliberated, and evaluated by the ALWTRT, the public, and NMFS, and some were modified or eliminated from further consideration as the process unfolded. Where the measures considered in the Final Rule would also affect state fisheries, the input of state fisheries agencies was important to ensure that conservation measures were feasible and safe in the various locations in which they would apply. State scoping and outreach helped inform the rulemaking efforts, and helped identify the measures that would be given extensive consideration in the NEPA process.

The Final Rule and FEIS reflect this extensive involvement by the numerous stakeholders and considered a reasonable range of alternatives.

Comment 5.2: Proposed rule and DEIS violated Executive Order (EO) 12898 by not reviewing issues of environmental justice, particularly for Maine's Washington County.

Response: EO 12898 requires agencies to consider whether their actions result in disproportionately adverse human health and environmental impacts on minority or low income populations. The DEIS addressed EO 12898 by examining the various counties affected by the ALWTRP rulemaking, and concluding that minority and low impact communities will not be disproportionately affected.

While Washington County has higher than state average low income and minority populations, Washington County is not disproportionately affected by adverse health and environmental impacts from the rulemaking when compared to other counties. Where the impacts of the ALWTRP rulemaking extend over a large area across multiple states, the county level is an appropriate level at which to assess whether there would result in disproportionate impacts.

The commenter's concerns appear to be economic in nature, as opposed to adverse human health and environmental impacts, which are the focus of EO 12898. See FEIS Section 10.12 for a complete analysis of this rule as it pertains to EO 12898.

Comment 5.3: NMFS' authorization of lobster and Jonah crab trap/pot fisheries violates the ESA by allowing entanglements.

Response: NMFS has satisfied its obligations under the ESA by reinitiating consultation on the operation of federal fisheries under eight federal fishery management plans and two interstate fishery management plans, which was completed on May 27, 2021, and consulting on the amendment of the ALWTRP itself, which was completed on May 25, 2021.

The ALWTRP does not authorize fisheries. NMFS disagrees with the commenter's claims that the ALWTRP "allows" entanglements. The ALWTRP does not state that entanglements are allowed, nor does it prevent fishermen from taking actions to avoid or prevent entanglements beyond what is required by this rule.

Comment 5.4: Allocating the full PBR to the trap/pot fishery violates the MMPA.

Response: MMPA Section 118 directs NMFS to develop take reduction plans to reduce the incidental mortality and serious injury of marine mammals incidentally taken by commercial fishing operations to levels less than a stock's PBR level. Section 118 does not address other sources of human-caused mortality (e.g., vessel strikes) and those other causes are not considered in the goals of the take reduction plan. The short-term goal of a take reduction plan is to reduce incidental mortality and serious injury of each marine mammal stock to below the stock's PBR in the commercial fisheries addressed by the plan, with a longer term goal of reducing incidental mortality and serious injury to 10 percent of a stock's PBR taking into account economics, available technology, and existing fishery management plans. NMFS has already reconvened the ALWTRT to develop recommendations for gillnet and other trap/pot fisheries.

Additionally, the FEIS analyzes other sources of impacts on right whales. Although beyond the scope of this rule, NMFS has identified evaluation of current measures to protect right whales from vessel strikes, as well as research into factors affecting health and abundance, collaboration with Canada on range-wide recovery efforts, and consideration of emerging threats as 2021 to 2025 priority actions in the right whale 5-year Species in the Spotlight action plan.

Comment 5.5: The Proposed Rule violates the MMPA by considering economics as a factor when choosing the preferred alternative.

Response: The commenter argues that NMFS is prohibited from considering the economic impacts of measures to be implemented in a Take Reduction Plan unless such measures are part of the MMPA's long-term goal of reducing mortality and serious injury to insignificant levels approaching a zero mortality and injury rate (often referred to as ZMRG). However, the distinction drawn by the commenter does not accurately reflect the statute. Under the MMPA, to reach the long-term goal requires the TRP to take into account the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans. The portion of the MMPA discussing the short-term goal of reducing mortality and serious injury to below a stock's PBR does not use this language. However, that does not mean that economics, technological limitations, and state or regional fishery management plans cannot be part of the consideration as to which measures should be chosen to achieve the short-term goal. Here, NMFS developed a 60-80 percent risk reduction target based on the latest PBR calculations and estimates of mortality and serious injury, and the ALWTRT developed recommendations based on this target. In choosing between measures that will accomplish the goal of reducing mortality and serious injury below PBR, the MMPA does not prohibit the consideration of economics, and here the agency's choice of measures to include in the Final Rule balances various factors, but does not do so at the expense of the risk reduction target to reach the short-term goal.

Comment 5.6: The Proposed Rule violates MMPA by not meeting ZMRG within 5 years.

Response: Under section 118 of the MMPA, NMFS is required to meet both the short and long-term take reduction plan goals of reducing mortality and serious injury incidental to commercial fishing operations. The short-term goal is to reduce mortality and serious injury to below a stock's PBR, while the long-term goal is to reduce mortality and serious injury to insignificant levels approaching a zero mortality and serious injury rate (i.e., ZMRG, defined as 10 percent of PBR in 50 CFR 229.2), taking into account the economics of the fishery, availability of existing technology, and existing state or regional fishery management plans.

Due to the continued entanglements of large whales in commercial fishing gear, NMFS is required to take additional action to further reduce mortality and serious injury incidental to commercial fisheries covered by the ALWTRP. NMFS will continue to discuss future plan modifications with the ALWTRT and has already reconvened the Team in light of these goals.

Comment 5.7: The Proposed Rule violates MMPA by not reducing PBR in six months.

Response: The MMPA created a framework for developing and issuing take reduction plans, monitoring the plans regularly, meeting with take reduction teams regularly, and amending plans if necessary to meet the goals of the MMPA. NMFS' actions have been consistent with the process laid out by the MMPA.

The first ALWTRP was issued in 1997, and NMFS has modified the ALWTRP numerous times since, with input from the ALWTRT to further the MMPA goals of reducing mortality and serious injury of large whales incidental to commercial fisheries.

As we state in the preamble to the Final Rule, for the purposes of creating a risk reduction target, NMFS assigned half of the right whale entanglement incidents of unknown origin to U.S. fisheries. Under this assumption, a 60 percent reduction in mortality or serious injury would be needed to reduce right whale mortality and serious injury in U.S. commercial fisheries, from an observed annual average of 2.2 to a PBR of less than one whale per year. See Chapter 2 of the FEIS for our revised analysis of PBR.

Comment 5.8: These additions to the ALWTRP may not prevent the continued decline of right whales.

Response: NMFS tasked the ALWTRT with developing measures to reduce risk of entanglement to meet the MMPA's goals that fisheries mortality and serious injury should be below PBR. It is not within the agency's discretion to disregard PBR, and the current rulemaking is the agency's attempt to reduce the risk of mortality and serious injury from the Northeast lobster and Jonah crab trap/pot fisheries to comply with the MMPA. That such measures in and of themselves may not result in recovery of the right whale population does not mean that NMFS can disregard the statutory direction of the MMPA.

Comment 5.9: State measures should be included in the Final Rule.

Response: NMFS agrees that the MMPA authority applies in both state and federal waters. Many state measures are included in the Final Rule, including Massachusetts weak insertion requirements and extension of the MRA north to the New Hampshire border. Because dynamic management is difficult to accomplish under federal procedural requirements and such measures were not part of the proposed rule, the Massachusetts extension of the state water closure into May was not included. Other Massachusetts measures, such as a maximum state water line diameter, were not included because they were not analyzed or part of the proposed rule.

Comment 5.10: NMFS "Purpose and Need" statement is too narrow.

Response: The Purpose and Need chapter of the FEIS states that the measures need to achieve a risk reduction of at least 60 percent, rather than an exact risk reduction target, and therefore, it was not meant to constrain the risk reduction to a specific number. Rather, this is the minimum target needed. Both of the action alternatives considered in the DEIS met the Purpose and Need. The Alternatives have been modified in the FEIS.

The Alternatives were selected because, using the Decision Support Tool, these suites of measures, which include ongoing and anticipated fishery management measures, measures that will be regulated by Maine and Massachusetts, and the benefits of the MRA, are estimated to achieve or exceed a 60 percent risk reduction necessary to reduce impacts to right whales to below the PBR level of 0.8 mortalities or serious injuries per year based on observed incidents. Thus, mortality and serious injury of right whales in U.S. fishing gear must be reduced by 60 percent (documented) to 80 percent (estimated) to achieve the MMPA goal of reducing fishery-related incidental mortality and serious injury to below the right whale PBR.

For more information on the Decision Support Tool and the input data, assumptions, and uncertainty please see FEIS Appendix 3.1.

In terms of the ESA, the Final Rule has been identified as a first anticipated step in the adaptive management approach within the conservation framework in the Section 7 Consultation on the authorization and permitting of a number of federal fisheries, including lobster and Jonah crab. Additionally, a consultation on the ALWTRP which included the implementation of Final Rule determined that the gear regulations implemented by the Plan for U.S. fixed gear fisheries including those measures in the Final Rule will have wholly beneficial effects to ESA-listed species or their critical habitat and therefore the Plan is not likely to adversely affect ESA-listed species or designated critical habitat.

Comment 5.11: NMFS cannot rely on CEQ's recent amendments to NEPA.

Response: Because the Notice of Intent to prepare an Environmental Impact Statement (84 FR 37822, August 2, 2019) was published prior to September 14, 2020, this action was prepared under the NEPA regulations first implemented in 1978. Text has been added to the Purpose and Need section (FEIS Section 2.2) to reflect this. As written, the FEIS addresses direct and indirect impacts in Chapter 5 (Biological Impacts), Chapter 6 (Economic and Social Impacts), and Chapter 7 (Summary of Biological, Economic, and Social Impacts). Cumulative Effects are addressed in Chapter 8, which also summarizes the direct and indirect impacts of the action as well.

Comment 5.12: NMFS failure to consider a "no commercial fishing" alternative is in violation of NEPA.

Response: Not allowing any commercial fishing is not a reasonable alternative under NMFS' regulatory responsibilities, namely the Magnuson-Stevens Act, and does not meet the Purpose and Need of the action nor the goals of the Plan. Per the agency's mission, NMFS is responsible for the stewardship of the nation's ocean resources and their habitat. We provide vital services for the nation: productive and sustainable fisheries, safe sources of seafood, the recovery and conservation of protected species, and healthy ecosystems—all backed by sound science and an ecosystem-based approach to management.

Comment 5.13: NMFS did not evaluate a reasonable range of alternatives or all reasonable measures in violation of NEPA.

Response: The development of the Proposed Rule was the result of an extensive public process involving the ALWTRT as prescribed by the MMPA, NEPA, and the APA. Many alternatives were considered, deliberated, and evaluated by NMFS, the ALWTRT stakeholders, and the public, but some were eliminated from further consideration as the process unfolded.

Where the measures considered here would also affect state fisheries, the input of state fisheries agencies was important to ensure that conservation measures were feasible and safe in the various locations in which they would apply. As such, state scoping and outreach helped inform the rulemaking, and measures given extensive consideration in the NEPA process. The FEIS reflects this extensive involvement by the numerous stakeholders and contains a reasonable range of alternatives for the agency and the public's consideration. The Alternatives were selected because, using the Decision Support Tool, they achieve or exceed a 60 percent risk reduction necessary to reduce impacts to right whales to below the PBR level of 0.8 serious injury or mortality per year.

Comment 5.14: NMFS rejected trap reductions in violation of NEPA.

Response: While agencies shall include reasonable alternatives not within the jurisdiction of the lead agency, these trap reduction strategies were not considered reasonable under the Purpose and Need due to multiple factors. They are complex, time-intensive, and carry a large administrative burden. For example, implementing a line cap would require pinpointing accurate data sources, identifying qualifying criteria, outlining an allocation method, and engaging the industry, on top of managing current measures. Given the need for rulemaking and conservation measures, these trap reduction strategies are not currently cost effective, nor could they be implemented in a timely manner. For more information on trap reduction strategies undertaken by the ASMFC, see response to Comment 6.5 below.

Comment 5.15: DEIS did not analyze all risks in concluding the rule will reduce mortality and serious injury below PBR in violation of NEPA and APA.

Response: In accordance with NEPA, as part of its cumulative impacts analysis, the DEIS described impacts to right whales and other large whales from various anthropogenic sources, including vessel strikes, aquaculture, and offshore energy development. However, attribution of sources of mortality in the PBR framework is not a legal requirement of NEPA, but of the MMPA. Section 118 of the MMPA directs that NMFS develop take reduction plans to reduce the mortality and serious injury of marine mammals incidental to commercial fishing operations to levels less than PBR for the marine mammal stock. While the DEIS did address other sources of impacts on right whales, the MMPA does not mandate that take reduction plans must reduce incidental mortality and serious injury from fisheries to levels that would accommodate mortality and serious injury from other anthropogenic sources within PBR. In other words, NMFS does not apportion PBR; PBR is a reference point that serves as the short-term goal for a take reduction plans and also alerts NMFS to take management actions needed to reduce all sources of human-caused mortality so that we can meet the overarching MMPA goal of recovering marine mammals to their optimum sustainable populations.

Comment 5.16: NMFS did not consider dynamic area management as required under NEPA and APA.

Response: The commenter is correct that in the past the take reduction plan included dynamic closure measures. Such measures were found to be problematic with the fixed gear lobster fishery, and so were not considered in this Final Rule. When a closure is made gear cannot be removed instantaneously, and factors such as weather and sea conditions affect the timing of gear removal. Dynamic closures must allow for safety concerns, which make them less effective from a conservation perspective, as such delays can result in gear remaining after whales are sighted, and may also result in a situation where, by the time fishermen are able to remove their gear, the whales may have already left the area subject to the closure. Further, while Canada began using dynamic closures in 2018 as part of its right whale conservation effort, in 2019 there were twelve Canadian right whale mortalities despite these measures. See Comment 9.2 under Restricted Areas and Borggaard et al. (2017) for further discussion of dynamic management.

Comment 5.17: Proposed rule violates MMPA and ESA because regulations are not effective and immediate.

Response: The MMPA take reduction rulemaking process is subject to procedural requirements arising from the APA, MMPA, NEPA, and ESA that make "immediate" protections in the form of a Take Reduction Plan amendment a legally difficult proposition. While there are circumstances in which MMPA emergency rulemaking authority may be exercised, NMFS has not concluded that this would be appropriate here, and even if this authority were used it would not allow for "immediate" protections, as there are other non-MMPA procedural steps that must occur. NMFS has undertaken the current rulemaking process using the best available scientific information while engaging with various stakeholders in the take reduction team process to develop effective conservation measures to reduce entanglements of right whales in Northeast lobster and Jonah crab trap/pot fisheries.

Comment 5.18: NMFS did not use the best scientific information available in violation of NEPA, MMPA, and ESA.

Response: The rulemaking process unfortunately cannot react instantaneously as new information comes to light. The MMPA take reduction planning process requires the involvement of numerous stakeholders in the TRT in the development of conservation measures, followed by the required NEPA and APA processes. At all points, however, NMFS uses the best available scientific information to inform its decisions, and when the TRT was reconvened, NMFS developed a 60-80 percent risk reduction target based on the latest PBR calculations and estimates of mortality and serious injury.

As NMFS prepared to publish the DEIS and Proposed Rule, new information regarding NARW population came in the form of preliminary estimates from the NMFS Northeast Fisheries Science Center in the fall of 2020. These estimates have since undergone additional review, and are being incorporated into the North Atlantic right whale stock assessment that includes a new PBR calculation, a process that includes public notice and comment. This new information is included in the FEIS.

Comment 5.19: The proposed regulation is not only unconstitutional, but a direct attack on the citizens and sovereignty of the state of Maine. You should refrain from implementing this regulation.

Response: NMFS is acting in accordance with direction from Congress under the MMPA and other applicable laws. See FEIS Chapter 10.

1.1.7 Line/Effort Reduction

At least 34 commenters were in favor of effort reduction through trap limits, line caps, and buybacks, as a way to reduce the number of vertical lines in the water, thus reducing risk to right whales, while a few were against any effort reduction measures. Maine DMR noted that the administrative burden of a line cap system is also something that has deterred them from pursuing this management measure. Several commenters pointed out that, due to latent effort, NMFS' assumptions on effort may be artificially high, though Maine's DMR stated that the latent effort calculations were consistent with their view. Some commenters suggested that fewer fishermen are entering the fishery, leading to a natural reduction in effort, and therefore line reduction was already taking place, which would contribute to the risk reduction goals of the Final Rule.

Comment 6.1: NMFS should review the amount of latent effort in the fishery, and ensure that latent effort is properly accounted for in determining the risk reduction value of any measures.

Response: Since the collapse of the Southern New England (SNE) lobster stock, the Atlantic States Marine Fisheries Commission (Commission) has taken action to attempt to address latency in LMA 2 and 3. The Commission's Lobster Management Board initiated Addendum XVIII to scale the SNE fishery to the diminished size of the SNE lobster resource with a consolidation program aimed at addressing latent effort (unfished allocation) and reductions in traps fished. Addendum XVIII included an approximate 50 percent trap reduction in LMA 2 implemented over 6 years and an approximate 25 percent trap reduction in LMA 3 implemented over 5 years. These trap reductions concluded in fishing years 2020 and 2021.

Given that the Gulf of Maine/Georges Bank (GOM/GB) lobster stock (overlapping with LMA 1, 3, and the Outer Cape) is at a near time series high for abundance, we can assume that the amount of latency is comparatively lower than that found in SNE. As discussed in Chapter 5 of the FEIS, positive market and lobster stock conditions for the GOM/GB stock incentivize fishermen to increase fishing effort and may encourage inactive fishermen to reenter the fishery. For that reason, it is likely that fishermen in the Gulf of Maine have been fishing at a high capacity in recent years. Maine, which accounts for the majority of permits issued in the Gulf of Maine, submitted data on latency rates of state permits (Appendix 3.2 of the DEIS), indicating a stable number of latent permits over the last 10 years (2008-2018). Of its approximately 6,000 permits issued, approximately 1,500 permits have no reported purchased landings and are considered latent. While other jurisdictions have not completed similar analyses, latency rates are likely similar.

Given the actions to reduce latency in LMA 2 and 3, the relatively low but stable amount of latency in LMA 1, and the current fishery incentives given high abundance in the Gulf of Maine, fishery data included in the Decision Support Tool are considered accurate and representative of existing fishery conditions, including existing rates of latency. See FEIS Chapter 5 for more details.

Comment 6.2: A range of views were expressed on the Non-preferred Alternative of capping buoy lines. One comment stated that NMFS should choose its Non-preferred Alternative of capping buoy lines at 50 percent of the average monthly lines fished in federal waters in 2017. Another expressed opposition to it, citing that Massachusetts is the only state where end lines are accurately counted or regulated, and it would be time and labor-intensive to develop such a system across the other states without funding or capacity to do so.

Response: Regulating buoy lines was analyzed in the DEIS and the FEIS as an element within the Non-preferred Alternative 3, taking an alternate approach to achieving risk reduction across the proposed areas that would reduce line numbers while allowing fishermen to respond to the reduction according to their preferences and individual operational capacity. Alternative 3 would cap the total number of lines available for trap/pot fishing in federal waters to 50 percent of the average baseline number of lines (2017) outside of state waters. Because this was not a Preferred Alternative, the exact regulatory mechanism for implementing a line cap was not identified. It was assumed, however, that NMFS would work with the Commission and New England states to qualify the number of buoy lines based on an April 29, 2019, control date (84 FR 43785, August 22, 2019) using vessel trip reports or, for Maine, other data sources to distribute allocations of line tags to fishermen.

NMFS did not select this Non-preferred Alternative because development of a buoy line control program would be time- and labor-intensive and come at a substantial cost to the industry. The Commission process, including soliciting public feedback, requires, at a minimum, approximately six months to develop an adaptive management action. Larger, more controversial actions can take 8 to 18 months. One commenter is likely correct that, given the lack of mandatory vessel trip reports in the federal lobster fishery in the baseline year of 2017, the Commission would have had to rely on state data as the best scientific information available to develop a qualification program through an addendum.

Given the variable data regarding individual fishermen's lobster fishing histories due to inconsistent state and federal reporting requirements, this would be a large and controversial action. Even once approved by the Commission, additional time would be required for NMFS to undertake a federal rulemaking and associated analysis. The FEIS estimates that a 50 percent reduction of buoy lines in federal waters would alone achieve an average 45 percent risk reduction in federal waters with economic impacts ranging from $3.9 to 13.4 million. The combined set of measures included in the preferred alternative was projected to achieve a 69 percent risk reduction at a cost of $9.8 to $19.2 million in the first year of implementation. Given implementation challenges, the economic impacts of this preferred alternative and the fact that the preferred alternative achieves the stated risk reduction target, buoy line reductions will not be implemented in the Final Rule.

Comment 6.3: States should cap and reduce the number of licenses, and reduce risk to right whales.

Response: Through the Commission's Interstate Fishery Management Plan for American Lobster, states and NMFS have made substantial efforts at capping the number of permits and traps authorized in the lobster fishery, which serves as a primary effort control. The concept of controlling lobster fishing effort by limiting access to historical participants began in 1994 when NMFS generally limited access into the federal lobster fishery to those who could document participation in the fishery before 1991 (59 FR 31938, June 21, 1994). Years later, in August 1999, the Commission passed Addendum 1 to Amendment 3 to the Interstate Plan, which limited access to Lobster Conservation Management Areas 3, 4, and 5 to only those who could document fishing history in those areas. Subsequent Commission addenda similarly attempt to control effort by limiting access to other Areas:

Table 2. Actions under Interstate Fishery Management Plan for American Lobster

Lobster Conservation Management Area	Commission Action[1]	Corresponding Federal Action
EEZ	March 1994-Amendment 5[2]	June 21, 1994 (59 FR 31938)
LMA 1	November 2009–Addendum XV	June 12, 2012 (77 FR 32420)
LMA 2	December 2003–Addendum IV[3] February 2005–Addendum VI November 2005–Addendum VII	 April 7, 2014 (79 FR 19015) May 10, 2005 (70 FR 24495)
LMA 3	August 1999–Addendum 1	March 2003 (68 FR 14902)
LMA 4	August 1999–Addendum 1	March 2003 (68 FR 14902)
LMA 5	August 1999–Addendum 1	March 2003 (68 FR 14902)
LMA 6	1995–by State action	Not Applicable in Federal Waters
Outer Cape Cod	February 2002–Addendum III May 2008–Addendum XIII	April 7, 2014 (79 FR 19015)
All Areas	February 2009–Addendum XII	April 7, 2014 (79 FR 19015)

The Commission has used a similar step-by-step approach in all of the areas. First, participants are qualified based upon their ability to document a history of fishing within the area. Second, those who qualify are allocated some number of traps within a given management area, based upon their ability to document the level of past fishing effort in the area.[4] These addenda have largely required that states implement similar limited access programs (with the exception of LMA 1, where recommendations were for the federal fishery only).

The Commission Interstate Plan has not included reductions to the number of permits issued in the lobster fishery. However, since area qualifications were implemented, the number of federal permits issued in each area has either held steady or declined. The 2020 American Lobster Benchmark Stock Assessment summarized state and federal permits issued in the lobster fishery, with approximately 1,400 fewer permits being issued in 2018 than in 2010. Further, the Commission has approved numerous actions that reduce area-specific maximum trap caps or reduce the number of traps allocated to each permit. Most recently, Addendum XVIII required an approximate 50 percent trap reduction in LMA 2 implemented over six years and an approximate 25 percent trap reduction in LMA 3 implemented over 5 years. These trap reductions concluded in fishing years 2020 and 2021.

The Commission recommended a reduction in the LMA 3 maximum trap cap as well as ownership caps in LMA 2 and 3 that are expected to further reduce the number of traps authorized in the areas, as part of Addenda XXI and XXII. NMFS is in rulemaking to consider the implementation of these measures. This FEIS anticipates this future rulemaking and has given credit to the risk reductions associated with Addenda XVIII, XXI, and XXII.

Comment 6.4: NMFS should remove half the traps from the water, which would reduce the risk to right whales while still allowing fishermen to make a living.

Response: Since 1994 under the Commission's Interstate Fishery Management Plan for American Lobster, states and NMFS have made substantial efforts at capping the number of

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[1] All Addenda can be found at www.asmfc.org, under Interstate Fisheries Management, American Lobster.

[2] New England Fishery Management Council document. This action occurred prior to the 1999 transfer of Federal lobster management to the Commission under the Atlantic Coastal Act.

[3] Addendum IV was rescinded in Addendum VI and then revised and approved in Addenda VII and XII.

[4] Through various addenda to the ISFMP for American lobster, history-based effort control plans based on fishery performance have been enacted by NMFS (LCMAs 1, 3, 4, and 5) and states (MA in Outer Cape Cod; NY and CT for LCMA 6; and MA, RI, CT,& NY for LCMA 2).

permits and traps authorized in the lobster fishery. Participation caps serve as a primary effort control. Reducing trap caps by half could result in less effort and, when paired with traps/trawl requirements, could reduce the number of lines being fished, with an associated reduction in risk to large whales. A number of fisheries and managers that have participated in the public meetings of the Commission and the Take Reduction Team have expressed confidence that, on productive fishing grounds, lobster trap reductions could occur without negative economic consequences. A number of studies have demonstrated this, see for examples Myers and Moore (2020) and Acheson (2013).

However, for a reduction in the number of actively fished buoy lines to be fairly distributed based on vessel fishing histories or other commonly used metrics, detailed knowledge of the amount of fishing effort by sector or individual vessel is required. Allocation decisions in effort control management of a capped resource (lines or traps) are also usually informed by iterative public fishery management processes and include appeal options that are administratively burdensome. Because the lobster fishery has variable reporting requirements across states, and because only about 10 percent of Maine fishermen have been required to report in any year and federal reporting has been variable, data to easily determine effective trap and line cap measures is not available. This was demonstrated by the failed attempt of the Atlantic States Marine Fisheries Commission to identify an effort limit addendum, as described in FEIS Section 3.1.1.2.

1.1.8 Management

We received thousands of comments on management issues, ranging from the use of adaptive management strategies to including southeastern states in future rulemaking to evaluating the effectiveness of the Final Rule. Thousands of commenters, primarily through campaigns organized by NGOs, but also at least 149 unique commenters, advocated NMFS taking emergency action to institute immediate vertical line reductions or closed areas, and of them, many suggested shutting down all fishing activities that involve vertical lines. Several also recommended shutting down all commercial fishing. We also received thousands of comments, again primarily through campaigns organized by NGOs, but also from 83 unique commenters, about our risk reduction calculations being based on outdated population estimates.

Comment 7.1: NMFS should use adaptive management to assess and recalibrate the measures every few years to reach goals of reduced entanglements in fishing gear.

Response: During the ESA Section 7 consultation on the operation of eight fisheries managed under federal fishery management plans and two fisheries managed under interstate fisheries management plans, NMFS identified the need for additional measures to meet the mandates of the ESA, and developed a Conservation Framework to outline the agency's commitment to implement measures necessary for the recovery of right whales. In addition to the current rulemaking that seeks to reduce risk of mortality and serious injury by 60 percent, the Conservation Framework provides for additional rulemakings to further reduce risk over the next decade at levels expected to lead to survival and recovery of the species. Central to the Conservation Framework is an adaptive management approach by which new information relating to the status of right whales and the impacts of fisheries and non-fisheries activities will be used to determine the extent of additional management measures needed.

Comment 7.2: NMFS should establish another process through which stakeholders can propose measures that could achieve equal or greater protections for right whales. The ALWTRP process is time-consuming, and does not allow for flexibility and adaptability.

Response: The MMPA requires NMFS to convene Take Reduction Teams and develop Take Reduction Plans. While this process can be time consuming, it provides a framework for developing mitigation measures and clear goals for the ALWTRP. The ALWTRT has the discretion to recommend mitigation measures that are flexible and adaptable in meeting the MMPA goals.

Comment 7.3: NMFS should include southeastern states in any future rulemakings, since right whales spend time in the southeast.

Response: To simplify and expedite rulemaking, NMFS chose to direct the ALWTRT efforts initially on the Northeast Region lobster and Jonah crab trap/pot fisheries because these fisheries constitute 93 percent of the U.S. buoy lines in areas where right whales occur. The Team includes southeastern state fishery managers as well as members that represent the South Atlantic Fishery Management Council and Southeast U.S. fishermen. NMFS has begun working with the ALWTRT to get their recommendations on further rulemaking that may include modifications to the southeastern fisheries that are subject to the ALWTRP. We will include outreach to stakeholders in these states in our future rulemaking efforts.

Comment 7.4: NMFS should enlist fishermen in disentanglement efforts, rather than relying on college students and other groups.

Response: Disentanglement efforts on large whales are conducted under a NMFS permit by highly skilled and trained responders throughout the U.S. These responders come from a variety of backgrounds, including fishermen, and NMFS regularly conducts training that specifically targets fishermen and other members of the on-water community. Disentanglement techniques, tools, and protocols have been developed over decades and have been used as a model for successful rescues and international disentanglement efforts. National and international trainees come from all over the world to learn from and train with our teams in the U.S. We do ask for assistance from untrained fishermen from time to time on specific cases, and will continue to do so to provide an effective disentanglement effort that is safe for both the disentanglement team and the whales.

Comment 7.5: NMFS should take emergency action to close all fisheries that use vertical lines or other gear that may entangle right whales, or to close all areas where whales may co-occur with fishing.

Response: There are several statutes that lay out the situations in which NMFS can take emergency action. In Section 118(g) of the MMPA, which many commenters mentioned, the Secretary of Commerce may implement emergency rules when incidental take from commercial fisheries are having "an immediate and significant adverse impact on a stock or species." Where there is already a take reduction plan in place, the Secretary should develop such emergency rules that are consistent with the plan to the maximum extent practicable, and follow "on an expedited basis" with amendments to the plan as recommended by the TRT to address the situation. In developing emergency rules, the Secretary must consult with the Marine Mammal Commission, TRT, fishery management councils, and state fishery managers. Emergency rules can only stay in place for 180 days, but can be extended for additional 90 days if an emergency situation persists.

Section 4(b)(7) of the ESA also includes emergency rulemaking authority provisions. NMFS has used this authority in the past to implement emergency rules for right whale protections (e.g. SERO 2006 gillnet closure, 71 FR 66469, Nov. 15, 2006). This authority is available when there is an "emergency posing a significant risk to the well-being of any species of fish or wildlife or plants." In an ESA emergency rulemaking, the Secretary must provide detailed reasons why the regulation is necessary, and must provide actual notice to state agencies in states where species occur. An ESA emergency rule can only last 240 days.

While ESA emergency rulemaking provisions explicitly waive the procedural rulemaking requirements of the APA and the ESA, the MMPA emergency rulemaking provisions are an alternative to the normal procedural requirements of the MMPA, and appear to implicitly waive the APA's notice and comment requirements.

These emergency provisions do not, however, waive other procedural requirements that agencies are subject to when undertaking a rulemaking, like NEPA, the Paperwork Reduction Act (PRA), or EO 12866. The NEPA regulations at 40 CFR 1506.12, for example, allow agencies to consult with the Council on Environmental Quality to develop "alternative provisions" in addressing an emergency situation, but agencies are expected to "limit such arrangements to actions necessary to control the immediate impacts of the emergency." EO 12866 provides that in an emergency situation, "the agency shall notify the Office of Information and Regulatory Affairs (OIRA) as soon as possible and, to the extent practicable, comply with subsections (a)(3)(B) and (C) of this section." The PRA includes emergency review provisions, subject to approval by the Office of Management and Budget (OMB) with a finding that the normal process will result in public harm or is not possible because of an unanticipated event, and even then the agency must take all practicable steps to consult with members of the public. To the extent that an emergency action would impact a wide range of the fishing community, the need to satisfy these procedural requirements would limit the speed of such actions.

Due to the above-referenced requirements for emergency action under the MMPA and ESA, including public notice and comment requirements NEPA, PRA, or EO 12866, and the limitations on how long an emergency rule can stay in effect (270 for MMPA, 240 days for ESA), NMFS believes that proceeding with the current action will provide the fastest relief and longest-lasting protections for right whales. NMFS generally views emergency actions to be appropriate where a clearly identifiable problem can be addressed with directed, focused measures, and such measures will effectively address the emergency in the timeframes to which such authorities are limited. Because it is difficult to predict where entanglements will occur given the relative scarcity of identified locations of entanglement, an emergency action to completely close all fisheries using vertical lines at this time would appear to be an overbroad use of its emergency authority. NMFS has not identified a geographic location or discrete temporal period within which emergency action would address a specific entanglement concern, and therefore NMFS believes that the complex issues associated with right whale fishery interactions are better addressed through the comprehensive approach in the Final Rule.

Comment 7.6: NMFS should take emergency action to immediately implement a year-round closure south of Martha's Vineyard and Nantucket.

Response: As noted in the response to Comment 7.5, we believe that the Final Rule will provide the fastest relief and longest-lasting protections for right whales, so we are not planning to take emergency action at this time. The Final Rule does include a seasonal closure south of Martha’s Vineyard and Nantucket that will be in effect from February to April, when right whales have been sighted most frequently in high numbers in this area.

We have selected the larger of the closed areas analyzed as a restricted area in Alternative 3 (Non-preferred) in the DEIS, but is in the Preferred Alternative in the FEIS and is being implemented in the Final Rule. This larger restricted area was best supported by the most recent sightings data. Since 2018, right whales have been documented to the west of the originally proposed closure, such that the closure could relocate lines into areas of equally high whale density during the restricted season. The Preferred Alternative in the FEIS and Final Rule area encompasses the majority of the area where the highest density of right whales have been sighted, and the most recent sightings in years not yet within the Decision Support Tool demonstrate these aggregations have persisted. Restricting buoy lines within this area between February and April provides an estimated 4.6 percent risk reduction for the entire Northeast and captures much of the risk within that area. See FEIS Section 3.1.2.5 for our revised analysis.

Comment 7.7: NMFS should take emergency action to immediately implement seasonal closures in the three areas in the Gulf of Maine: Downeast summer closure from August 1-October 31, a western Gulf of Maine spring closure from May 1 to July 31, and an offshore migration closure from October 1 to April 30.

Response: As noted above, we believe that the Final Rule will provide the fastest relief and longest-lasting protections for right whales, so we are not planning to take emergency action at this time. NMFS analyzed the closure areas in the three Gulf of Maine areas proposed in an emergency rulemaking petition submitted by The Pew Charitable Trusts. Along with the year-round closure proposed in Southern New England, these four areas would achieve an estimated 12.6 percent risk reduction according to Decision Support Tool Version 3, using the updated right whale habitat density model (2010-2018). However, the team working on the current rule would have to divert to preparing a new emergency rule and the required NEPA analyses. As noted above, emergency measures may only be implemented within the limited timeframe provided by the statutory authority, and the approximate 67 percent risk reduction from the current rule far exceeds the estimated risk reduction suggested by the commenters. The Final Rule is a priority in order to implement broad risk reduction in a timely manner. See FEIS Section 3.4 for a further discussion of this and other alternatives that were considered but rejected.

Comment 7.8: NMFS should issue emergency regulations that remove vertical buoy lines from the water in areas of high entanglement risk to North Atlantic right whales.

Response: As noted above, NMFS would typically use its emergency authority in situations where a clearly defined problem can be addressed using discrete measures in a defined geographical area to effectively provide conservation protections within the limited timeframe provided by the statutory authority. Because the location of entanglements are so rarely observed, it is difficult to pinpoint times and places where emergency measures might provide effective protections from entanglements. NMFS has not currently identified new areas where emergency regulations would be appropriate, but the Final Rule includes comprehensive measures that address entanglements on a broad scale, including measures that will reduce vertical buoy lines through trawling up and seasonal area closures. See FEIS Chapter 3.

Comment 7.9: How will the regulations in this Final Rule be evaluated?

Response: NMFS anticipates annual meetings of the Team to review the North Atlantic right whale and other large whale distribution and abundance data, mortality and serious injury data, retrieved entanglement gear analyses, fishing effort data, and other relevant research results. As they become available, these new data will also inform the evolving Decision Support Tool. Modifications to seasonal restricted areas will be considered annually by the Team, and they may make recommendations to amend the Plan, as needed. Following the recommendations of the NMFS Expert Working Group asked to review right whale surveillance and monitoring programs (Oleson et al. 2020), we anticipate a three-year surveillance and review cycle, providing additional opportunities to evaluate right whale distribution data to gauge seasonal restricted areas and other conservation measures contained in the ALWTRP.

Comment 7.10: NMFS should evaluate the success of past regulations, like sinking groundlines and breakaways, before adding more regulations.

Response: Under Section 610 of the Regulatory Flexibility Act, NMFS is required to review any significant rule to evaluate the continued need for regulation. To allow for sufficient time for economic adjustments to occur and for data to become available, we review rules every 7 years. The most recent ALWTRP rule was published in 2015, and will be coming up for review shortly.

Comment 7.11: Several commenters suggested that NMFS ban commercial fishing, ban certain commercial fishing gears, or focus on reducing the demand for seafood.

Response: MSA is the primary law that governs marine fisheries management in U.S. federal waters. First passed in 1976, the MSA fosters the long-term biological and economic sustainability of marine fisheries. Its objectives include preventing overfishing, rebuilding overfished stocks, increasing long-term economic and social benefits and ensuring a safe and sustainable supply of seafood. The Atlantic Coastal Fisheries Cooperative Management Act, governing the U.S. lobster and Jonah crab trap/pot fisheries, directs the federal government to support the management efforts of the Atlantic States Marine Fisheries Commission (Commission) and, to the extent the federal government seeks to regulate a Commission species, develop regulations that are compatible with the Commission's Interstate Fishery Management Plan and consistent with the MSA's National Standards. Banning or disincentivizing commercial fishing would be inconsistent with our mandates under these laws.

Comment 7.12: NMFS should require all vessels in fixed-gear fisheries to use Vessel Monitoring Systems and/or AIS, submit Vessel Trip Reports, and have observer coverage in order to get better information on distribution and density of vertical lines.

Response: NMFS supports the collection of high resolution spatial data in the lobster fishery. The Commission recommended the collection of mandatory harvester reports in the federal fishery, as part of Addendum XXVI to Amendment 3 to the Interstate Fishery Management Plan for American Lobster. NMFS is in rulemaking to develop harvester reporting requirements that complement the Commission's Interstate Plan for lobster. NMFS intends to work with the Commission, through a technical working group, to develop additional high resolution spatial data collection objectives and requirements, while balancing the financial burden to industry.

Comment 7.13: If the lobster/Jonah crab trap/pot fishery had been managed like the Northeast Multispecies fishery, there would be fewer offshore fishing permits, and we wouldn't be having this problem.

Response: The interaction risk of a protected species is largely associated with the gear type, but also the quantity of gear in the water, gear soak/tow duration, and the temporal and spatial overlap of the gear and a given protected species. For the critically endangered North Atlantic right whale, fixed gear fisheries with lines linking gear on the ocean floor to surface marking systems (buoys, etc.) pose the greatest risk as they have accounted for the majority of identifiable past fishery interactions. The DEIS indicated that the 2017 IEC model estimated that over 93 percent of fixed gear buoy lines within right whale habitats along the Northeast U.S. Atlantic coast are fished by the lobster and Jonah crab fishery. Thus, the lobster and Jonah crab fishery poses the greatest risk to right whales and has been the focus of this action. For comparison, the Northeast multispecies fishery authorizes the use of fixed gear (e.g., gillnets), however, it is a relatively small component of the fishery and one of several fisheries comprising the other 7 percent of fixed gear fisheries with buoy lines.

The MSA, governing the Northeast Multispecies Fishery Management Plan, and the Atlantic Coastal Act (ACA), governing the Interstate Fishery Management Plan for American Lobster are the primary laws governing marine fisheries management in U.S. federal waters. First passed in 1976, the MSA fosters the long-term biological and economic sustainability of marine fisheries. Its objectives include preventing overfishing, rebuilding overfished stocks, increasing long-term economic and social benefits, and ensuring a safe and sustainable supply of seafood. The ACA directs the federal government to support the management efforts of the Commission and, to the extent the federal government seeks to regulate a Commission species, develop regulations that are compatible with the Commission's Interstate Fishery Management Plan and consistent with the MSA. These laws allow for the updating of management measures to meet legislative and management objectives. While adjustments to management measures may affect the quantity of gear fished, soak time or tow duration, or the spatial or temporal usage of gear, and, thus, may alter the interaction risk associated with any fishery to protected species, they are unlikely to dramatically alter the gear usage in these fisheries.

Comment 7.14: These rules will create safety hazards for fishermen, and will not reduce right whale entanglements or mortalities.

Response: We acknowledge that open ocean fishing is inherently dangerous, and that fishing is one of the most dangerous occupations. Fishermen configure their operations in the ways that work best for them, and any regulatory changes that require them to modify their practices can increase risk until adaptations to the new practices are made. Although some commenters have criticized the deference that NMFS gave to the states and offshore fishery members in developing the Proposed Rule analyzed in the DEIS, the extensive outreach to fishermen informed the development of measures included in the Final Rule. Fishermen informed measures with important information such as number of traps that can fit safely on deck at one time, amount of force on rope hauled under commercial fishing practices, rope size that fits safely through blocks and haulers on commercial vessels, sizes of vessels and crews fishing at various distances from shore, local fishing conditions, and conservation equivalencies.

Alternative 2 (Preferred) of the FEIS and the Final Rule consider those public comments, including many of the conservation equivalencies requested, and accommodate those changes along with measures from the Proposed Rule that benefitted from earlier scoping. Together, these measures should prevent this rulemaking from introducing hazards beyond those that already exist in the lobster and Jonah crab fisheries.

Comment 7.15: NMFS should also evaluate the effects of these regulations on all the other large whale species in the region.

Response: Chapter 5 of the FEIS evaluates the effects of the Final Rule on large whales, other protected species, and habitat.

Comment 7.16: Thousands of commenters were concerned that cryptic mortality and uncertainty in the data was not taken into account when choosing the risk reduction target, and recommended an 80 percent risk reduction target or higher, with a few suggesting 100 percent.

Response: The application of cryptic mortality estimates in determining annual entanglement mortality and serious injury rates relative to the PBR level was a new concept when first introduced to the ALWTRT in 2019. Peer review of the cryptic mortality estimate had not yet been completed and although it was discussed in the 2018 Marine Mammal Stock Assessment Report (Hayes et al. 2019) that was available to the Team for the April 2019 meeting, cryptic mortality was not incorporated into the entanglement related mortality and serious injury estimates in that report. The 60 percent target based on documented mortality was in itself seen as a difficult challenge for the Team given uncertainties about the location of origin of most documented entanglement events. The 80 percent target was an initial attempt to account for early estimates of cryptic mortality, but was even more daunting and the Team recognized the uncertainty in that higher target given the many unknowns related to the unseen mortalities, including cause and location of deaths. Therefore, while the Team accepted the challenges of a 60 percent mortality and serious injury risk reduction, they were unable to agree on the higher target. The recent paper by Pace et al. 2021 on cryptic mortality and the more recent analysis in the current population estimate (Pace 2021) now provide more support for the 80 percent target than at the time the ALWTRT undertook its efforts to develop recommendations. Our understanding of cryptic mortality will affect management decisions going forward as new stock assessments and PBR calculations incorporate this new science.

Here, NMFS considered this new information, as well as the remaining uncertainty around apportioning mortalities to country and source, conservation equivalency recommendations from states and stakeholders, and the need for urgency in completing the current rulemaking constraining us to the scope of the analyses in the DEIS. Resulting modifications to the Final Rule included selection of a larger area closure south of the islands and modifications to management measures that improved risk reduction estimates to achieve a nearly 70 percent risk reduction as determined by the Decision Support Tool. Further efforts by NMFS to estimate serious injury and mortality and to apportion the estimates to country and mortality source will be included in guidance to the ALWTRT to support their development of recommendations for further amendments to the ALWTRP.

Comment 7.17: NMFS should focus risk reduction efforts on areas of high right whale occurrence.

Response: Chapter 3 in the FEIS describes how the alternatives were developed and explains that while precautionary measures are required throughout the regulated areas, more restrictive and protective measures are focused on areas of high right whale co-occurrence with buoy lines (e.g. the hotspot analysis that identified restricted areas). Particularly, the months and areas with highest whale occurrence and co-occurrence are the areas that were selected for seasonal restricted areas. However, as described in Chapters 2, 3, and 8 of the FEIS, there is also a great need to implement measures that will be resilient to changes in whale distribution and therefore requires broader precautionary risk reduction across the regulated area.

Comment 7.18: ASMFC pending measures should not be counted in analyzing risk reduction.

Response: Noted in the ALWTRT recommendations and throughout the development of this rule, other relevant actions that we considered to be reasonably certain to occur within the timeframe evaluated within this rule were treated as such in our analysis of anticipated risk reduction throughout the regulated area. We commit to monitoring the progress of these related actions and reporting our findings to the ALWTRT at future meetings for consideration.

Comment 7.19: Massachusetts did not ban single traps on vessels longer than 29 feet in their rule, so how was that risk reduction re-allocated?

Response: During the development of the Proposed Rule, NMFS discussed this measure with the Massachusetts Department of Marine Fisheries and recognized that it was likely to be positive toward risk reduction. However, we were unable to estimate the impacts on risk. Since we did not assign any quantified risk reduction to that measure in the DEIS, there was no need to re-allocate it.

Comment 7.20: NMFS should adopt Maine's proposed conservation equivalencies.

Response: As discussed in FEIS Section 3.3, NMFS is adopting most of the conservation equivalencies offered by Maine out to 12 nm, and is appreciative of the work done by Maine Department of Marine Resources and the Zone Councils to develop and recommend weak insertion and trawling up requirements in collaboration with Zone Councils that are familiar with capacity and constraints of Zone-specific fishing operations and conditions.

Comment 7.21: Maine should get gear reduction credit if Maine funds tags or development of a GPS tracker.

Response: Technology and tracking in and of themselves do not reduce the risk of fishing gear on large whales. However, if Maine develops a line reduction program and reporting/tracking technology that demonstrates line reduction, it would be considered toward risk reduction.

Comment 7.22: In LMA 3, NMFS should analyze the difference in risk reduction between a 50 percent reduction in buoy lines and the proposed closure with potential gear displacement.

Response: Several scenarios were analyzed in Georges Basin Restricted Area for the DEIS and FEIS, including a 50 percent reduction in lines through a line cap or through trawling up and a restricted area. The FEIS includes longer trawl lengths in this area compared to the DEIS (50 traps per trawl versus 45 traps per trawl) but still implements broader trawling up measures throughout LMA 3 in order to distribute risk reduction more evenly. The Georges Basin Restricted Area was predicted to increase co-occurrence in the DEIS (See co-occurrence maps in Chapter 5 and Appendix 5.2).

Comment 7.23: How is the Massachusetts Restricted Area credit being added to the risk reduction estimates?

Response: FEIS Section 3.3.5.1 discusses credit assigned to the Massachusetts Restricted Area and provides an assessment of risk reduction with and without application of the value of that area. The Team unanimously supported including credit for the Massachusetts Restricted Area, which was fully implemented in its current configuration in 2015 (79 FR 36585), given recent years' increased use of that area by right whales (e.g., Ganley et al. 2019).

Comment 7.24: Were all the proposals evaluated using the same model?

Response: Each individual risk reduction measure and suite of measures were run through the Decision Support Tool (DST) Version 3 to identify the estimated contribution to risk reduction across the Northeast Region as defined by the Northeast Trap/Pot Management Area.

Comment 7.25: The Woods Hole Oceanographic Institute has developed a methodology in collaboration with the fishing industry to attribute risk to gear based on proportion of water column occupied. This information must be considered in this rulemaking.

Response: We anticipate adding this information to the DST in the near future. However, this is less important for the current rulemaking because an endline, assuming it approximates a straight line from the bottom to the surface, occupies all portions of the water column equally and the lobster industry has incorporated sinking groundline so groundlines may be assumed to have negligible presence in the water column. Incorporating proportions of the water column occupied are more critical for complex structures like gillnets or potential aquaculture installations, in which case it is important to model both the proportion of water column occupied but also which portion of the water column is occupied and the vertical distribution of whales. This will be incorporated into the DST for future analysis of risk posed by different gear types that do not use the entire water column.

Comment 7.26: Some commenters questioned the validity of the threat component of the

DST.

Response: The threat model based on the TRT opinion poll is no longer in use. Starting with the CIE review in 2019, the threat model has been based only on the analysis of empirical data on rope breaking strengths, rope samples retrieved from entangled whales, and whale spatial distributions. At this time, the model is unfortunately constrained to rope breaking strength but in two years of polling scientists and stakeholders, nobody has proposed a viable alternative. It is appropriate for the threat model to be equally weighted with line and whale density because entanglement risk only exists when lines are present, whales are present, and the lines pose a risk to whales. If any of these three factors are not present, the risk of entanglement is zero.

Comment 7.27: The DST is critically flawed in its reliance on an estimate of gear threat that significantly overemphasizes the contribution of rope strength to entanglement risk. By failing to account for the uncertainty inherent in the DST, NMFS overestimated the effectiveness of the selected methods for reducing risks tor right whales.

Response: There are uncertainties in the DST calculations that we have not fully quantified. However, it is important to distinguish between uncertainty and bias and we have no reason to believe that the inputs and therefore model outputs are particularly biased high or low. Thus, while there is unquantified uncertainty around the risk reduction calculated by the DST, it is equally likely that actual risk reduction is higher than estimated as lower than estimated and no reason to believe that risk reductions are overestimated.

Comment 7.28: NMFS should implement these regulations as soon as possible as any delays come at the expense of right whales.

Response: NMFS recognizes the urgency of the current situation and intends to implement these regulations to provide needed conservation benefits to right whales as soon as possible. We intend to implement new seasonal restricted areas 30 days after the rule is finalized. Massachusetts Restricted Area fishermen have indicated that it takes several trips for them to remove all of their gear, and because of unpredictable winter weather and holidays, they remove and move beginning at least a month in advance of their February 1 closure. The LMA 1 closure will likely result in moved trawls rather than trawls brought to the beach and stored on land so may not require round-trips to the dock. Many fishermen moving gear from the South Island Restricted Area would be expected to remove gear prior to the February 1 closure; one month should provide sufficient time to remove gear. Gear configuration changes including trawling up, weak buoy lines or weak insertion installation, and gear marking, will be delayed for a longer period of time because these buoy and groundline modifications will take substantial time. The delayed effective date will factor in winter or low effort months when many fishermen have removed gear from the water for maintenance. The actual effective dates will depend on when the Notice of Availability of the FEIS and the Final Rule are released. Our intention is that all measures will be in place for the next fishing year starting in the spring of 2022.

Comment 7.29: Some components of the rule state prohibitions “to fish with, set, or possess” where other portions leave out “set.” If this was strategic, please clarify how “setting” is separate from the regulatory intent of “to fish with.

Response: This was carryover language from the existing regulations. The word “set” is included within seasonal restricted areas; seasons when gear must be removed unless fishing without buoy lines. During the season that the gear can be fished with gear configuration requirements referenced in the regulations, the word “set” is not included.

Comment 7.30: It is our understanding that any trap, pot, contrivance etc. that is capable of catching a lobster is required to have a valid lobster trap tag affixed to it. This would indicate that any trap which falls into this category is subject to the marking, weak insert, and trawling up requirements of this rule. We would ask for clarification on this assumption from NOAA, which should help to guide discussions in the next ALWTRT process which will be aimed at the additional gear types of gill nets and fish pots.

Response: Any trap/pot within the Northeast Trap/Pot Management Region with a lobster trap tag will be required to comply with the marking, weak insert, weak line, and trawl length requirements.

Comment 7.31: While some of these proposals may end up being effective, this proposal makes very clear that there is insufficient mortality and tracking data on right whales, and many of the suggested changes will be considerably more detrimental to the fishing industry than beneficial to the whales.

Response: The Decision Support Tool estimates at least a 60 percent reduction in entanglement risk, which is spread across the region to remain resilient to changes in right whale distribution. The population and distribution are frequently monitored via aerial/vessel surveys as well as with acoustic detection, and will be evaluated to ensure the measures are targeting areas where entanglement risk exists. See more about monitoring in response to Comment 9.10.

Comment 7.32: The proposed rule does not consider reduction in effort, particularly for recreational fisheries. PEER urges NOAA to consider the effect of reducing or eliminating recreational fisheries in right whale habitat.

Response: The ALWTRP only regulates Category I and II commercial fixed gear fisheries identified in the Plan. Additional regulation of recreational fisheries is outside the scope of the current rulemaking.

1.1.9 Research

Comments on research generally fell into one of three categories: whale distribution, insufficiency of current data, and entanglements. Many of the fishermen commenting said they had either never seen a right whale where they fish, never seen or heard of an entangled right whale in areas where they fish, did not believe that there was any recent evidence of entanglement in their trap/pot lines, and questioned the validity of the scientific models on whale distribution.

Comment 8.1: NMFS has not shown that entanglement in lobster trap/pot gear contributes to low birth rates.

Response: There is a wealth of research that demonstrates that stressors, including entanglements in fishing gear like traps/pots, have effects on marine mammal health and reproduction. Entanglements in fishing line, such as those used in the lobster trap/pot fishery, is energetically costly for right whales and requires expenditure of a portion of their energy budget that would otherwise be allocated to reproduction (van der Hoop et al. 2017a). Entanglements can reduce overall whale health and increase calving intervals (Rolland et al. 2016, Moore et al. 2021). Entanglements that restrict feeding further impact energetic reserves and ability to feed (van der Hoop et al. 2017b). An inability to get enough food is also an important factor in the reproductive health of right whales (Meyer-Gutbrod et al. 2015). See FEIS Chapters 5 and 8.

Comment 8.2: Healthy whales don't get entangled in fishing gear; there is something else wrong with them.

Response: Several commenters stated the belief that healthy whales do not get entangled in fishing gear. Entanglement in fishing gear is a global problem that has been documented for many whale and dolphin species. In the Northeast Region, humpback and minke whale entanglements are not uncommon. More than 85 percent of North Atlantic right whales have experienced entanglement in fishing gear, many more than once. A recent assessment of all right whale photos reveals that entanglement scarring injuries have increased, with roughly more than 30 percent of the population having at least minor entanglements each year. Much of the population has been entangled multiple times, and there is a more than 90 percent chance that a healthy female will get entangled between each calving cycle potentially contributing to reduced calving rates. Repeated and chronic entanglement affects whale health and some whales with unrelated compromised health status may be more vulnerable to injury and death. However, there is no evidence that healthy whales are more adept at avoiding entanglement.

Comment 8.3: NMFS should hire mechanical engineers to examine the rope and net configurations that are causing entanglements to occur.

Response: NMFS conducts extensive analysis of recovered gear from entangled whales using our gear team, which includes former and active fishermen. We also regularly consult with active fishermen who have decades of experience and are well versed in various fishing methods and local practices. The various configurations we have seen over decades of recorded entanglements varies widely, but the basic fact is that rope or net in the water column has the potential to entangle large whales. NMFS also funds bycatch reduction research, and considers research by right whale scientists that include modeling of entanglement configurations. NMFS does not believe that hiring mechanical engineers is necessary.

Comment 8.4: NMFS should develop a plan to monitor all whale entanglements, including observer coverage and satellite monitoring.

Response: NMFS, state, and independent research organizations coordinate monitoring whale entanglements. Monitoring of entangled whales is done through comprehensive survey effort to resight individuals and check for entangling gear or scarring. Satellite position beacons are sometimes attached to gear entangling a whale to facilitate finding the whale for a disentanglement effort. Because whale entanglement incidents are rare relative to fishing effort hours and whales typically carry gear away from incident sites before a vessel returns to the gear, an observer program is not an effective means for large whale entanglement monitoring.

Comment 8.5: How can NMFS justify a seasonal restricted area if there have been no confirmed entanglements in that area in over a decade? No North Atlantic right whales have been entangled in gear attributable to Maine trap/pot gear in at least 15 years, because the whales no longer are in Maine waters.

Response: No gear remains on most right whales that bear entanglement scars. In the cases where gear does remain, it is rarely collected, and even more rarely has any identifying marks. Between 1980 and 2016, the New England Aquarium analyzed 1,462 right whale entanglement interactions (A. Knowlton pers comm). Only 110 of these incidents had gear still attached, and in only 13 cases could that gear be traced to the original set location. Because we lack information on exactly where interactions occur, we use areas of high co-occurrence of right whales and fishing gear as a proxy for identifying areas of high entanglement potential. The Decision Support Tool also considers the type of gear in determining the risk of a serious entanglement that would cause mortality or serious injury. The seasonal restricted areas identified in the Final Rule are based on hot spots, areas with high current and historic habitat use by North Atlantic right whales, high fishing gear density and high configuration threat. The population and distribution are monitored via aerial/vessel surveys as well as with acoustic detection, and will be evaluated to ensure the restricted areas are effective. See more about evaluation below in response to Comment 9.10.

Until September 2020, when Maine required gear marking in exempted waters, most Maine lobster fishery buoy lines were unmarked. Therefore, if a buoy line fished by a vessel operating under a Maine permit entangled a right whale, the odds of tracing that rope to a Maine lobster fishery buoy line have been extremely low. The commenters are correct that no rope retrieved from a right whale has been specifically traced to gear set by Maine trap/pot fishermen since the 2000s. However, cases in 2011 and 2012 were identified as U.S. unknown trap/pot gear with red ALWTRP marks, consistent with the marking scheme for Maine fishermen outside of exempted waters during those years. Additionally, a number of anchored minke whales and humpback whales have been identified in Maine gear in the past 15 years. Maine lobster buoy lines entangle and kill whales.

As noted by the commenters, right whale distribution has changed in the past decade, and there may be fewer or less dense aggregations of whales in the Gulf of Maine. Right whales continue to occur in Maine waters; however, and given the endangered status of the population, the high rate of entanglements evidenced by scars on right whales, and the continued mortality and serious injuries above PBR, NMFS must provide protective measures throughout the population's range in U.S. waters.

Comment 8.6: One commenter indicated that the data shows that gillnet and netting gear were the most prevalent gear (other than Canadian snow crab gear) and the Northeast lobster fishery were the least prevalent in right whale entanglements.

Response: As detailed in Chapter 2, while gillnet gear may be identified at rates higher than anticipated given the relative number of buoy lines, there are more cases identified as trap/pot found on right whales than identified gillnet gear and the most prevalent gear seen on right whales is described as unknown rope.

Comment 8.7: The Decision Support Tool relies on coarse data for both line density and whale density, and should not be used. There is no way to model where the whales are and where the gear is with any degree of certainty.

Response: The Decision Support Tool (DST) was and continues to be the best available analytical tool to assess the co-occurring risk of large whale entanglement in commercial fixed gear. The model compiles the best available large whale habitat density modeling by Roberts et al. (2016) which incorporates data from nearly every systematic marine mammal survey of the eastern United States. The DST also draws from every available state and federal fisheries data source to incorporate the best available estimate of the distribution of fixed gear fisheries vertical lines within the Exclusive Economic Zone. We agree that there are uncertainties associated with this model, and any model, but we are confident in the DST's ability to inform the Team's discussion and recommendations toward a risk reduction goal.

Comment 8.8: NMFS right whale population model overestimates the cumulative mortalities.

Response: The estimates of total mortality are derived from a peer-reviewed methodology designed to estimate the abundance of North Atlantic right whales. The model itself is a version of methodology used for many species of wildlife in which particular statistical characterizations are used to characterize the capture and/or resighting (both alive and dead) histories of individually marked whales to estimate survival rates. These models take into account that individuals are not seen every year, and this particular model allows individuals to have different probability of being "captured" on each capture occasion.

It is true that these models cannot distinguish between true mortality and the appearance of mortality that would come from an individual permanently leaving the survey areas. For that to happen in great abundance would suggest that many whales use the U.S. and Canadian coasts for enough time to become catalogued and then decide to move elsewhere and never return. There is simply no evidence for that scenario. Indeed, there is abundant evidence that the great mobility and long life of right whales allows them to take modest sojourns to Icelandic and even Norwegian waters and return to the survey areas to be "recaptured" once again.

Very few wildlife populations even approach having all mortality documented by detected carcasses. Despite the vast survey effort directed at right whales, given the large amount of area that right whales travel, right whales and other large whales likely die without their carcasses ever being seen.

Comment 8.9: NMFS should use a longer time series to make any determinations, as well as acoustic and prey data.

Response: The FEIS is a compilation of the best available scientific information including information on documented and projected changes in prey distribution. Acoustic data are used increasingly used to identify right whale distribution and are included in the near real-time sightings posted on our website at *fisheries.noaa.gov/resource/map/north-atlantic-right-whale-sightings*, and passive acoustic monitoring research is available at *apps-nefsc.fisheries.noaa.gov/pacm/#/narw*. For a complete list of citations, see the list of references included at the end of every FEIS chapter.

Recent population models demonstrate that the right whale population decline began in 2010 and accelerated around 2015 (Pace et al. 2021). We cannot wait another decade to respond to that decline.

Comment 8.10: Thousands of commenters who submitted comments as part of a campaign noted that the Proposed Rule relied on outdated population estimates to calculate PBR, and requested that the calculations be updated and a new PBR determined.

Response: The calculations in the DEIS showing how NMFS proposed to achieve that risk reduction relied on the 2018 Stock Assessment report available when the DEIS was drafted, using 2016 population estimates. The FEIS has been updated with the most recent population estimate (Pace et al. 2021) and stock assessment data (Hayes et al. 2020), including the PBR of 0.8, down from 0.9 in the DEIS. For more, see FEIS Section 2.1.1.

Comment 8.11: NMFS should use peer-reviewed science before implementing any regulations.

Response: NMFS concurs. The FEIS is a compilation of the best available scientific information. Included in the FEIS are data from the Stock Assessment Reports, which are peer reviewed by the Atlantic Scientific Review Group and subject to review by the public, and results from the Decision Support Tool, which underwent an independent peer review conducted by the Center for Independent Experts.

Comment 8.12: The data used to determine whale distribution is flawed and incomplete, and therefore should not be used to make regulations.

Response: NMFS disagrees with this assessment. The whale distribution data is the best available information. Although more data will help increase the accuracy of analysis results, there is no indication that results to date are incorrect, nor is there evidence that either the data or the analytical approaches taken to date are flawed. The data have been collected with strict adherence to established protocols, and analyses have used accepted peer-reviewed statistical methods.

Comment 8.13: What are the migratory patterns of right whales in LMA 2?

Response: An interactive map of right whale sightings data, including sightings in LMA

2, can be found online at *fisheries.noaa.gov/resource/map/north-atlantic-right-whale-sightings*.

Comment 8.14: NMFS should do more to gather data on right whale distribution, including increasing aerial, boat-based, and drone surveys.

Response: We agree that more data are needed to refine our understanding of right whale distribution. With available resources, NMFS is maintaining aerial surveys, increasing acoustic surveys and investigating additional tools to document whale distribution and individual identification. NMFS is working to identify the primary factors that correlate with right whale distribution to help identify other areas where right whales are likely to occur to direct future survey efforts.

Comment 8.15: NMFS should develop ways to tag and track right whales.

Response: NMFS agrees that tagging would help us learn more about right whale movements and habitat use. Long-term attachments used in past studies require an invasive approach to implant tag anchors. These efforts were halted on right whales out of concerns regarding potential health impacts. NMFS has supported development of less invasive tags to track (greater than 24 hours) right whales since 2014. First, we began supporting an investigation into using dart-style Low Impact Minimally Percutaneous Electronic Transmitters (LIMPETs) on right whales. Although a few of the tags successfully tracked right whale movements through the mid-Atlantic, most tag attachments were relatively brief. Fortunately, there was no evidence of negative health impacts in any of the whales that were tagged. We also began, and continue to support, the development of blubber-only tags. These are slightly more invasive than the LIMPET tags. The fieldwork component of this study was interrupted by the global pandemic. Still, tag enhancements continue to be supported including investigations into tag materials, tag retention methods, etc. It should be noted that despite several decades of development, many of the technical and logistical challenges of tagging continue to limit the utility of this approach. It is therefore important for NMFS to continue and enhance existing monitoring programs to provide whale location information for a large portion of the population.

Comment 8.16: NMFS should use spotter planes to make fishermen aware of when whales are in their area.

Response: NMFS uses multiple means to track right whales, including aerial surveys and acoustic monitoring systems. Near real-time sighting information can be found on our website at *fisheries.noaa.gov/resource/map/north-atlantic-right-whale-sightings*.

Comment 8.17: Warming in the Gulf of Maine is causing changes in copepod distribution, driving whales to Canada, and out of Maine.

Response: NMFS agrees that large whales are susceptible to ecosystem changes caused by climate change and right whale habitat use changes have been documented. Baleen whales will most likely continue to expand or shift their current range in response to prey species but the nature of the impacts varies by species (MacLeod 2009). Right whale habitat shifts in recent years follow their preferred prey farther north as the Gulf of Maine warms (Meyer-Gutbrod et al. 2018, Meyer-Gutbrod and Greene 2018, Record et al. 2019a, Record et al. 2019b). Climate change impacts their preferred prey abundance, which is known to impede reproductive success in this species (Meyer-Gutbrod et al. 2015a). Since 2010, there has been a documented change in right whale prey distribution that has shifted right whales into new areas with nascent risk reduction measures, increasing documented anthropogenic mortality (Plourde et al. 2019, Record et al. 2019). However, data shows that while abundance and duration of stays may have shifted, right whales still occur in waters offshore of Maine and throughout the Gulf of Maine at various times of the year. Past and near real-time right whale sighting information can be accessed online at *fisheries.noaa.gov/resource/map/north-atlantic-right-whale-sightings*.

Comment 8.18: North Atlantic right whales do not occur in coastal, shallow waters or in LMA 1, and therefore, Maine coastal waters, particularly inside the 3 nm line, should be exempted from these regulations.

Response: Gear marking and weak insertion requirements inside the Maine exempted waters are not included in this rulemaking. These measures are (gear marking) or will (weak insertions) be implemented by Maine DMR. Note, however, that the risk reduction benefits of weak insertions are considered in the FEIS.

Comment 8.19: Massachusetts lobster and Jonah crab trap/pot fishing gear has never killed a right whale. These regulations will not save whales and will force Massachusetts lobstermen out of business.

Response: No gear remains on most right whales that bear entanglement scars. In the cases where gear does remain, it is rarely collected, and even more rarely has any identifying marks. Between 1980 and 2016, the New England Aquarium analyzed 1,462 right whale entanglement interactions (A. Knowlton pers comm). Only 110 of these incidents had gear still attached, and in only 13 cases could that gear be traced to the original set location. Because we lack information on exactly where interactions occur, we use areas of high co-occurrence of right whales and fishing gear as a proxy for identifying areas of high entanglement potential. For example, the Massachusetts Restricted Area was identified in the 2014 modifications to the ALWTRP based on high co-occurrence given frequent habitat use by North Atlantic right whales and fishing gear density. There are other areas in Massachusetts that have been identified as hotspots where entanglement risk is high for right whales based on predicted whale density and the presence and strength of trap/pot gear (see Chapter 3).

There are cases in 2011 and 2012 where gear was recovered and were identified as U.S. unknown trap/pot gear with red ALWTRP marks, consistent with the marking scheme for Massachusetts fishermen outside of exempted waters during those years. In 2001 and 2016, right whale mortalities or serious injuries in Massachusetts lobster gear were avoided only because they were successfully disentangled. Additionally, a number of anchored minke whales and humpback whales have been identified in Massachusetts gear in the past 15 years, so Massachusetts lobster buoy lines do entangle and kill whales.

Comment 8.20: Whale population data is flawed because right whales are traveling between Iceland and Labrador, and are not dead as the model suggests.

Response: The right whale population model estimates the number of right whales that have disappeared from the population. Given the high percentage of the population seen in most years, those whales are to some extent presumed dead. It is possible that some right whales are not dead, but have emigrated to another area for an extended period. Some individuals have been resighted after an absence of many years. This is unusual, however, and it is unlikely that all the whales considered dead have only emigrated. We currently have few records of right whales seen beyond Newfoundland, and to date the whales photographed in the Eastern Atlantic have all been seen again in U.S. waters. See our response to Comment 8.7 for more detail.

1.1.10 Restricted Areas

The vast majority of commenters associated with campaigns, as well as at least 97 unique commenters, support restricted areas as a management tool, with many suggesting that some or all of the closures should be larger and/or longer. A few commenters did not support specific restricted areas, and some did not support restricted areas of any kind. Many commenters supported the idea of dynamic management for restricted areas, such that the areas could be opened if no right whales were documented in the area at the time of a closure or areas could be closed upon the sightings of right whales. Several commenters questioned the risk reduction value for the Massachusetts Bay Restricted Area, which we did continue to include in our risk reduction estimate for the Preferred Alternative, as described in FEIS Section 3.3.4.2

Comment 9.1: Several commenters suggested that restricted areas should apply to gillnet/mobile gear.

Response: The ALWTRT is meeting to develop recommendations to reduce the risk of gillnet and other trap/pot fisheries on right whales and other large whales. Seasonal restricted areas are likely to be among the risk reduction strategies considered by the Team.

Comment 9.2: NMFS should use dynamic closures such as those being used in Canada. Dynamic closures would allow fishermen to keep fishing as long as the whales are not there.

Response: The ALWTRP has used Seasonal Area Management to protect right whales in areas of annual predictable aggregations since the inception of the Plan. The Plan also has employed dynamic management to protect temporary right whale aggregations. Measures implemented through amendments to the Plan in 2002 triggered closures or gear modification requirements for lobster and gillnet fishing within a prescribed distance from sightings of right whale aggregations. Borggaard et al. (2017) summarizes the ALWTRP's amendments, including the evolution of the Dynamic Area Management (DAM) program. More than 60 dynamic area management zones were implemented between 2002 and 2009. Borggaard et al. notes that the program was administratively burdensome and attracted significant complaints regarding feasibility and effectiveness, ranging from delayed implementation preventing whale protection, to such rapid implementation that fishermen could not safely remove or modify their gear in time for the required effective dates. Given these concerns about the DAM program, the Team modified the Plan to instead apply broad-based extensions of the gear modifications used in DAMs (such as sinking groundline required in most trap trawls through 2009 Plan amendments). Broad-based gear requirements afford protection to whales, and is a measure that is resilient to changes in whale and fishery distribution.

Although it was not effective at preventing mortalities in 2019, Canada's vessel speed and fishery dynamic management program seems to have afforded substantial protection to right whales in the Gulf of St. Lawrence in 2018 and 2020. Canada implements time-area closures with boundaries that vary based on direct observations that respond to annual or seasonal resources distribution changes. To be done well Canada currently implements an intensive and expensive surveillance program through aerial surveys and acoustic monitoring. Canada also has an agile regulatory implementation authority.

While NMFS and our collaborators may be able to support an intensive surveillance program when resources are available, the U.S. regulatory requirements are not as agile. As discussed above, while DAMs were being implemented, NMFS rulemaking was often unsuccessful at responding rapidly to changing conditions. NMFS rulemakings under the MMPA and ESA are also subject to procedurally complex federal laws and requirements that Canadian resource management is not subject to, including NEPA, PRA, APA, and EO 12866. These laws include consultation requirements, notice and comment requirements, and environmental and economic analyses of the impacts of federal rulemaking before final decisions can be made about federal actions that could have environmental effects. Evaluating the impacts of future actions that have not yet been determined is logistically very challenging. NMFS, other federal agencies, and many collaborators are continuing to develop models that may be able to project prey and whale distribution into future months that could provide tools to develop predictable triggers for dynamic area management measures.

Comment 9.3: Many commenters voiced concern that NMFS had not adequately accounted for the effort displacement and crowding that will be caused by closures.

Response: In response to these comments, we modified our analysis in the FEIS to consider the impacts that would be caused by vessels relocating gear from the LMA 1 Restricted Area to offshore waters of Maine Lobster Zones C, D, and E. The analysis in FEIS Section 6.3 estimates the landing reduction for all vessels outside 12 nm in Maine Lobster Zones C, D, and E by using data from the Maine DMR harvester reports, which are only available for 10 percent of Maine lobster fishermen, and from 100 percent of the dealer reports.

Comment 9.4: How will the restricted areas affect mobile gear fishermen?

Response: Restricted areas may result in opening up of fishing habitat that mobile gear vessels have not been able to access due to the presence of lobster trawls, although the benefits may be marginal.

Mobile gear fishermen have expressed concerns about conflicts with ropeless gear trawls that may be fished under EFPs and that could increase gear conflicts if trawlers do not know the gear is on the bottom. The Final Rule changes existing and new seasonal restricted areas from fishing closures to buoy line closures. This would allow the use of gear fished without buoy lines (commonly referred to as "ropeless" gear). Fishermen who obtain EFPs to fish without buoy lines could pose some gear conflict threat to mobile gear fishermen. Ropeless experimentation with the proper authorization can be done anywhere, however access to areas otherwise closed to lobster fishing could incentivize fishermen to conduct ropeless fishing within the seasonal restricted areas.

Ropeless experimentation in the lobster and black sea bass trap/pot fisheries is occurring already. In the northeast, NMFS and ropeless fishing collaborators are working with groundfish and scallop bottom trawl fishermen to assess bottom marking technology being developed to allow mariners to detect lobster. Concerns that this experimentation will occur broadly in the near term appear to be unfounded. Due to the cost of ropeless technology, for the foreseeable future we believe that ropeless experimentation will be limited to collaborators accessing the NMFS ropeless gear cache, with perhaps an additional 10 percent of trawls being fished with other ropeless units. The NMFS gear cache also loans technology to collaborating mobile gear fishermen. For the next few years, we anticipate that the largest number of trap/pot trawls that could be supported by these efforts would approach about 330 pot/trap trawls coastwide (Maine through Florida). Additionally, we anticipate that EFP conditions will require participants to work with adjacent trawl fisheries, as well as other notice requirements that will prevent gear conflicts and support enforcement efforts. Collaboration across gear sectors, use of the NMFS ropeless gear cache, and reporting and monitoring conditions under exempted fishing permits should keep costs and gear conflicts to a minimum while ropeless technology is evaluated for potential use as an alternative to fishery closures.

Comment 9.5: Many commenters were concerned that restricted areas would create "walls" of dense gear right outside the borders, posing a greater risk to right whales.

Response: We have modified our analysis in the FEIS to consider gear displacement in response to the restricted areas. These analyses resulted in changes in the South Island Restricted Area selected for Final Rulemaking, and was one of the reasons that a seasonal buoy line closure was not selected for the Georges Basin Restricted Area in the preferred alternative. Updated calculations on the gear displacement effects of restricted areas suggested the alternative restricted areas displaced gear to areas of equal or higher co-occurrence, although "walls" of gear were not projected. The borders of the restricted areas are not uniformly productive lobster habitat. Fishermen are more likely to redistribute their gear to fishing ground that is productive. Please see Chapters 3, 5, and 6 of the FEIS for more details.

Until recently, NMFS had no evidence that existing closures created "walls" of gear. In April 2021, however, concentrations of gear were observed in a small open area east of the state of Massachusetts extended spring closure area and west of the Massachusetts Restricted Area (MRA). This appears to be an unintended consequence of the state extension of the MRA in state waters to the northern state boundary. Although this patch of Massachusetts Bay is not a productive fishing ground during this season, fishery managers believe that fishermen permitted to fish in both state and federal waters did not remove their gear in response to the closure, but instead moved gear out of the state waters and into this small open band of water while waiting for the MRA to open up May 1 (Bob Glenn, Massachusetts DMF, pers comm April 26, 2021). Federally permitted fishermen may also have been staging their gear, taking it out over multiple trips and days until the MRA opened. NMFS will consider future rulemaking to extend the northern boundary of the MRA across to the coast to close that gap and prevent an annual development of this high-risk dense gear storage area. The unconstricted nature of waters surrounding other seasonal restricted areas are not expected to similarly aggregate gear.

Comment 9.6: NMFS should add a restricted area north of Georges Bank and/or expand the Georges Bank restricted area. Georges Basin has a right whale hot-spot analysis five times greater than LMA 1.

Response: The Final Rule does not implement a restricted area in Georges Basin, but instead includes additional reduction of lines in this area (50 traps/trawl within the restricted area). The previous analyses suggest that it is difficult to restrict fishing in this hotspot without pushing effort to areas that increase risk outside of the hotspot based on predicted whale density (see co-occurrence maps in Chapter 5 and Appendix 5.2 the DEIS). Broad line reduction, however, achieves line and associated risk reduction without incidentally increasing co-occurrence of gear with right whales within this area.

Comment 9.7: The Pew Charitable Trusts' online message campaign of more than 47,000 submissions requested that NMFS implement a year-round closure South of the Islands, and seasonal closures in three areas in the Gulf of Maine: Downeast summer closure from August 1-October 31, a western Gulf of Maine spring closure from May 1 to July 31, and an offshore migration closure from October 1 to April 30.

Response: NMFS analyzed the Gulf of Maine closures proposed by The Pew Charitable Trusts along with the year-round closure proposed in southern New England. These four areas would achieve an estimated 12 percent risk reduction according to Decision Support Tool Version 3, using the updated right whale habitat density model (2010-2018).

However, to implement these measures, NMFS would have to set aside the current rulemaking conducted under the ALWTRT, and divert staff working on Final Rule and FEIS to prepare a new rule and NEPA analyses, not a small undertaking. The Final Rule, which is estimated to achieve approximately 67 percent risk reduction, is the NMFS priority. See FEIS Section 3.4 for a further discussion of the petition and other alternatives that were considered but rejected.

Comment 9.8: Many commenters wanted to know how NMFS will evaluate and modify restricted areas based on changes to whale distribution, and how often those evaluations will take place.

Response: NMFS anticipates annual meetings of the Team to review the North Atlantic right whale and other large whale distribution and abundance data, mortality and serious injury updates, retrieved entanglement gear analyses, fishing effort data, and other relevant research results. These data will be incorporated into the next iterations of the Decision Support Tool. The Team will consider modifications to seasonal restricted areas on an annual basis, and the team will continue to make recommendations to amend the Plan. Following the recommendations of the NMFS Expert Working Group, which reviewed the right whale surveillance and monitoring programs (Oleson et al. 2020), the NEFSC anticipates a three-year surveillance and review cycle, providing an additional opportunity to review right whale distribution data to evaluate seasonal restricted areas and other conservation measures contained within the ALWTRP.

Comment 9.9: Restricted areas should be based on the best available science, which includes recent and historical sightings, acoustic data, and prey data.

Response: As described in FEIS Section 5.1, the seasonal restricted areas that are being implemented through the Final Rule are based on the best available information, including recent and historical right whale and other large whale sightings data, acoustic monitoring data, and data on prey distribution. The FEIS includes analysis based on updated data that has become available since we drafted the DEIS.

Comment 9.10: Dynamic triggers for closures would not be feasible, and NMFS should remove that from consideration in the Final Rule.

Response: NMFS agrees that real time data are not available to develop an effective trigger for restricted areas. To reduce risk to right whales, the LMA 1 area will be implemented as a closure to lobster/Jonah crab fishing with buoy lines from October through January each year.

Comment 9.11: Commenters suggested that LMA 1 was designated a “hotspot” for right whales based on old data, and should be analyzed using data after the ecosystem shift that began in 2010. As a result of old data, the analysis in the proposed LMA 1 closed area appears to be disproportionately high in risk reduction value compared to the Massachusetts Restricted Area, given the relatively low abundance of right whales in that area and the high abundance in Cape Cod Bay.

Response: In the DEIS, we evaluated whale data from 2003 to 2017 (Whale model 8, DST Version 2). The proposed LMA 1 Seasonal Restricted Area was estimated to have the same risk reduction value of the MRA. However, when the Duke whale model was updated to include only whale distribution since 2010 (Whale model 11, DST Version 3), while the spatial distribution off Maine generally didn't change, the relative abundance of right whales did. Using the newer data, the LMA 1 restricted area contributes less risk reduction benefit (approximately 6.6 percent) than was considered in the DEIS when considered across all of the Northeast Lobster Trap/Pot Management Area. However, the value of the LMA 1 Seasonal Restricted Area remains an important piece of the risk reduction for Maine permitted fishermen. See FEIS Sections 3.1.2.5.1 and 5.3.1.1.2 for more information regarding the selection and analysis of the LMA 1 restricted area.

The LMA 1 Seasonal Restricted Area was created to supplement the risk reduction contribution of the Maine lobster fishery to the overall 60-80 percent risk reduction for the Northeast Trap/Pot Management Area, following the ALWTRT’s recommendation in April 2019 to spread risk reduction across jurisdictions. The original recommendation approved by the Maine caucus achieved that level of risk reduction primarily through a 50 percent line reduction. However, after the ALWTRT meeting, the Maine DMR and the Maine Lobstermen’s

Association members on the Team withdrew their support for such extensive line reduction measures. Maine DMR developed alternatives and used an alternative risk reduction calculation to demonstrate their belief that their alternative, which included broad use of weak insertions and some trawling up to reduce vertical buoy line numbers, achieved a 60 percent risk reduction. NMFS' analysis of the Maine risk reduction measures for the DEIS estimated that the Maine DMR revisions were insufficient to achieve 60 percent risk reduction for Maine-permitted fishermen in LMA 1. In discussions regarding preliminary analyses with Maine DMR prior to their submission of alternatives, NMFS suggested a closure along the LMA1 Restricted Area border with LMA 3 to improve the risk reduction calculation for that area during winter months when right whales have been demonstrated to aggregate in offshore waters.

Comment 9.12: NMFS erred in conducting hot-spot analysis by Lobster Management Area rather than the region as a whole, and as a result, fails to provide evidence that the LMA 1 Restricted Area is supported by the data.

Response: We disagree. As analyzed in FEIS Section 5.1, and in comment 9.11 above, the LMA 1 Restricted Area provides significant risk reduction for right whales. This area was identified as part of a Northeast Trap/Pot Management Area fishery-wide hotspot analysis. See FEIS Section 3.1.2.4 for further details.

Comment 9.13: Several commenters suggested that LMA 1 should be closed in the spring rather than fall, both to alleviate lost profits and to protect calves.

Response: In evaluating the risk reduction provided by the restricted areas, we relied on the peer-reviewed DST. The DST does not indicate substantial risk reduction from restricted areas implemented in the spring or summer months. The DST indicates that October through January demonstrate the most effective risk reduction to right whales. See FEIS Section 5.1 for more information. Estimated right whale habitat density and co-occurrence is included in the table below.

Table 3. LMA 1 Monthly Right Whale Density and Co-Occurrence with Buoy Lines

Month	Right whale habitat density	Right Whale Co-Occurrence
January	6.31	23.50
February	1.37	3.87
March	0.12	0.33
April	0.16	0.43
May	0.98	1.74
June	0.85	1.26
July	0.44	0.66
August	0.17	0.37
September	0.35	0.74
October	4.50	11.00
November	8.75	24.42
December	5.37	15.99

Comment 9.14: NMFS should allow ropeless fishing in LMA 1.

Response: The LMA 1 Seasonal Restricted Area would be a buoy line closure rather than a fishery closure. Fishermen with an EFPfor fishing without the use of persistent buoy lines would be able to fish within the seasonal restricted area from October to January.

Comment 9.15: NMFS should reconfigure the LMA1 restricted area so that it would be narrower and run the entire length of the Area 1 line, and should also be at least the same size—if not larger—on the Area 3 side of that line, too. This would spread the burden of the closure, and would benefit the whales according to the co-occurrence model. It would also reduce crowding at the area borders, and the accompanying gear conflicts and losses.

Response: This is a novel idea that could have been assessed if it had been received during scoping. Because this proposed seasonal restricted area was not analyzed in the DEIS, we are unable to implement it through final rulemaking at this time. The ALWTRT could consider this as an amendment during future discussions.

Comment 9.16: A number of commenters suggested that the LMA 1 restricted area was not supported by the acoustic data, either because acoustic gliders were not deployed at the right time of year, or because the acoustic data showed that only 27 percent of the right whale detections were inside LMA 1.

Response: The right whale habitat model (Duke Model Version 11) that the LMA 1 Restricted Area was based on projects a higher density of whales in this area throughout October to January. Like some commenters, given the lack of recent systematic surveys in this area, we were concerned that whales might not be using this area after they shifted distributions in the last decade. The glider data validated that right whales are still in LMA 1 during the season predicted by the Duke Whale Habitat Model (Version 11).

The commenter notes that only 27 percent of reported positions from deployed acoustic gliders were inside the LMA 1 Seasonal Restricted Area and season. The glider data supports the Duke whale habitat model (Version 11), which estimates higher whale densities on the LMA 3 side of the LMA boundary than the LMA 1 side. The glider data does, however, validate that whales are still in this area seasonally. Gear density on the LMA 3 side is much lower than on the LMA 1 side. We initially assessed a restricted area that included both sides of the boundary, but determined that there was minimal benefit from the LMA 3 side. LMA 3 vessels are adopting trawling up and weak line measures that provide greater risk reduction, so the restricted area does not include the LMA 3 side of the boundary.

During the comment period, we received information that we had underestimated the number of vessels that would be affected by the LMA 1 Restricted Area. In our revised analysis, we considered that in conjunction with the fact that there are only about 75 LMA 3-permitted vessels. LMA 3 vessels have higher rates of vessel trip reporting, which contributes to our estimates of gear distribution. However, because we also received anecdotal reports of higher gear densities on the LMA 3 side than our data indicate, we are investigating whether LMA 1 permitted vessels are inaccurately reporting location, or whether we are we are underestimating gear density and entanglement threat on the LMA 3 side.

We have modified our analysis of the value of the LMA 1 Seasonal Restricted Area in the FEIS. See Chapters 3 and 5.

Comment 9.17: NMFS should add restricted areas in LMA 3, as a huge majority of the boats there already fish 45 pot trawls or longer, and the proposed regulations will have little effect on reducing the risk posed by fishing in LMA 3.

Response: Alternative 3 analyzed restricted areas in offshore waters of LMA 3. The Final Rule does not implement restricted areas in LMA 3, and instead requires a combination of trawling up and weak rope requirements. Some areas originally considered for seasonal closures to buoy lines in LMA 3 were difficult to create without just shifting the risk (see co-occurrence maps in Chapter 5 of the FEIS). Broad line reduction and weak rope requirements achieved associated risk reduction without incidentally increasing co-occurrence with right whales within this area. Contrary to the comment, the average baseline gear configuration according to the line model in the DST is 35 traps per trawl, so requiring a minimum of 45 traps per trawl is predicted to reduce lines in this area. The new preferred alternative offers a conservation equivalency that would result in an average of 44 traps on a trawl, but with longer trawl lengths occurring in areas of high whale density, thus offering slightly greater risk reduction for LMA 3.

Comment 9.18: The Massachusetts Bay Restricted Area should be expanded.

Response: The Final Rule would expand the restricted area to include state waters to the Massachusetts/New Hampshire line, mirroring the regulations implemented by Massachusetts Division of Marine Fisheries in the Code of Massachusetts Regulations, Title 322 Section 12.

Comment 9.19: We ask NMFS to expand its proposed trigger of three right whales to extend the Massachusetts Bay Restricted Area to include a cow/calf as a trigger, in addition to three right whales.

Response: The Final Rule does not include a dynamic opening mechanism or trigger for the Massachusetts Bay Restricted Area.

Comment 9.20: Seasonal restricted areas should be re-evaluated as a management measure once the commercial fishery transitions to ropeless fishing systems.

Response: We anticipate that the ALWTRT will consider the appropriateness of existing and new seasonal management areas at meetings annually within the context of the best available information on large whale distribution, abundance, mortality, birth rates, and population metrics. Should ropeless fishing develop as an operationally feasible alternative to closures, that will also be evaluated.

Comment 9.21: What is the risk reduction value to other large whale species of the South Island restricted area?

Response: A new analysis suggests that the South Island Restricted Area is not estimated to reduce risk reduction for humpback whales or fin whales.

Comment 9.22: NMFS should establish a larger restricted area south of Nantucket, which has become recognized as an important winter habitat for right whales.

Response: The Final Rule implements the larger South Island Restricted Area, which had been analyzed in Alternative 3 (Non-preferred) in the DEIS. See FEIS Chapter 3 for the South Island Restricted Area selected for implementation.

Comment 9.23: The South Island Restricted Area should be closed year-round, as NMFS has confirmed that the area south of the islands is a year-round habitat for the species.

Response: The monthly risk scores within the South Island Restricted Area are shown in the table below. The risk within this specific area is estimated to be very low between June and November. A year-round closure is not supported by this data. The closure is being implemented when the risk level and predicted whale density are the highest.

Table 4. South Island Restricted Area Monthly Risk Scores

Month	Default Risk	Right Whale Habitat Density
1	4.12	83.85
2	3.54	87.82
3	3.25	92.54
4	3.68	104.14
5	1.32	47.87
6	0.19	4.54
7	0.03	0.61

Month	Default Risk	Right Whale Habitat Density
8	0.02	0.5
9	0.03	0.67
10	0.08	1.4
11	0.38	8.4
12	1.95	45.39

Comment 9.24: Because right whales use the South Island area year-round, NMFS should require only one buoy line between May and October to reduce risk of entanglement in this heavy offshore gear.

Response: The use of one buoy line on long trawls in areas of high mobile gear fishing effort would likely increase gear conflicts until technology becomes available that allows surface detection of bottom gear. Work on this challenge is currently being conducted to support the development of ropeless fishing methods, including a collaboration with mobile gear fishermen to assess bottom gear marking technology. These efforts could make this possible for future consideration as a risk reduction measure.

Comment 9.25: NMFS has drastically underestimated the amount of fishermen actively fishing in the LMA 1 restricted area, and thus the effects of the restricted area on fishermen. If there are only 45 fishermen in the LMA 1 restricted area, the risk reduction value of the closure should be much lower, since that would mean there aren't many buoy lines in that area.

Response: Based on the comments we received from Maine fishermen saying that we had underestimated the number of fishermen in LMA 1, we have modified our economic analysis of the impacts of the LMA 1 seasonal restricted area. Fishermen fishing in the fishing zones that are bisected by the LMA 1 restricted area are not all required to submit vessel trip reports, making a precise count of affected vessels difficult. Based on fishermen's input, the evaluation, which can be found in FEIS Section 6.3, now assumes that up to 50 percent of the vessels that fish outside of 12 nm in Maine Zones C, D, and E, up to 60 vessels, may have landings from the restricted area. The other half of the vessels may be crowded by the vessels that move from the restricted area into the waters 12 nm offshore of Maine Zones C, D, and E, reducing their catch rates. As a result, our estimate of vessels that may be affected by the LMA 1 Restricted Area has been increased to 120 in the FEIS. See FEIS Section 6.3

Estimated buoy line numbers are only one component of the risk estimated for the LMA 1 Seasonal Restricted Area. Three factors are considered: whale density, gear density, and threat of the configuration of gear used in an area. Those were sufficient to identify this area as a hotspot, as described further in FEIS Section 3.1.2.4.

Comment 9.26: If NMFS closes an area during the summer, the available fishing window would be cut by 40 to 50 percent.

Response: There are no summer restricted areas in this Final Rule. For analysis of the restricted areas being implemented in this Final Rule, see FEIS Section 1.4.3.

Comment 9.27: NMFS should require that fishing vessels operate at less than 10 knots under EFPs in restricted areas, regardless of their vessel length.

Response: Vessel speed restrictions are likely to be included as a condition of EFPs for activities in seasonally restricted areas. Evidence suggests that 10 knot speed restrictions within areas of large whale occurrence have successfully mitigated vessel strikes (Laist et al. 2014). Fishing vessels actively fishing either operate at relatively slow speeds, drift, or remain idle when setting, soaking and hauling gear. Listed species in the path of a fishing vessel would be more likely to have time to move away before being struck. However, fishing vessels transiting to and from port or between fishing areas can travel at greater speeds and could strike a right whale or other vulnerable species. A 10-knot transit requirement for fishing vessels authorized to harvest lobster from seasonally restricted areas is merited as these areas are seasonally important to right whales.

Comment 9.28: Closures in offshore areas would also minimize the impact on fishermen, because the majority of lobster fishing occurs closer to shore.

Response: For an explanation for how seasonal restricted areas were selected, see FEIS Section 3.1.2.4 and for a description of the number vessels impacted and the economic impacts by seasonal restricted areas considered in the preferred and non-preferred alternatives, see FEIS Section 6.3.

1.1.11 Ropeless Technology

We received thousands of comments, including the majority of campaign comments, on ropeless fishing, with the vast majority of non-fishermen supporting an immediate transition to ropeless gear throughout the northeast lobster and Jonah crab trap/pot fishery, and the majority of fishermen opposing ropeless fishing on the grounds that it is expensive, unproven, and impractical for a variety of reasons. While ropeless technology is not required in the Final Rule, fishermen who wish to try ropeless fishing may apply for an EFP, and will be able to fish in the restricted areas to test the technology.

Comment 10.1: NMFS should promote the permitting process and make sure that all fishermen are aware of and have the opportunity to participate in EFP trials of ropeless gear.

Response: An EFP is a permit issued by NMFS' Greater Atlantic Regional Fisheries Office. EFPs authorize a vessel to conduct fishing activities that would otherwise be prohibited under the regulations at 50 CFR part 648 or part 697. Generally, EFPs are issued for activities in support of fisheries-related research, including landing undersized fish or fish in excess of a possession limit for research purposes, seafood product development and/or market research, compensation fishing, the collection of fish for public display, or in this case, testing various aspects of ropeless gear. Anyone that intends to engage in an activity that would be prohibited under these regulations (with the exception of scientific research on a scientific research vessel, and exempted educational activities) is required to obtain an EFP prior to commencing the activity. While NMFS believes that ropeless gear should be widely tested by vessels under varying operating conditions, researchers submitting the EFP requests will be responsible for soliciting and securing participants.

Comment 10.2: Many fishermen had questions and concerns about the feasibility of ropeless fishing. Fishermen were concerned about whether ropeless technology could work in areas subject to different tides, on different bottoms, and in different weather conditions. Others raised concerns about conflicts with bottom-tending mobile gear, conflicts with other ropeless traps/pot gear, a reported 80 percent retrieval rate, an increase in lost gear, which leads to ghost gear, and the need for a marking system. Still others were concerned that ropeless technology is not ready to be implemented, and would take too long to implement. Concerns about repairs, enforcement, expense, and safety hazards were also raised.

Response: We acknowledge that considering broad scale deployment of ropeless fishing requires additional planning and research to overcome obstacles to implementation. This would include many of the potential issues identified within these comments. However, technologies are developing to enable fishermen to increase the rate of successful retrieval of ropeless gear and to minimize gear conflicts and increase enforceability over time. NMFS has invested a substantial amount of funding in the industry's development of ropeless fishing gear. We anticipate that these efforts to facilitate and support the industry's development of ropeless gear will continue, pending appropriations, including cooperative research and field trials, economic analyses and cost projection, and policy implementation, among the many factors that require consideration and further study.

Comment 10.3: NMFS should offer buybacks or subsidies for fishermen unable to transition to ropeless gear.

Response: Section 312(b) of the MSA establishes the mechanism for NMFS to conduct a buyback or fishing capacity reduction program. It requires funding appropriations from Congress and a determination that the program is necessary to prevent or end overfishing, rebuild stocks of fish, or achieve measurable or significant improvements in the conservation and management of the fishery.

Comment 10.4: NMFS did not analyze the costs or effects of conflicts between ropeless gear and bottom-tending mobile gear, or the effects of ropeless-only fishing areas on mobile gear fisheries, some of which significantly overlap with prime scallop grounds.

Response: NMFS agrees that this would be useful information to analyze but was unable to provide a specific cost estimate in the FEIS. We have modified our discussion of the effects of gear conflicts associated with ropeless gear. See FEIS Section 3.3.3.

Comment 10.5: NMFS needs to invest in the technology to make it viable, which should include working with manufacturers to develop virtual gear marking systems and to tailor the devices to the needs of fishermen in different areas.

Response: NMFS has invested a substantial amount of funding in the collaborative development of ropeless fishing gear. Virtual gear marking systems are being tested by mobile and fixed gear fishermen and we anticipated that these efforts will continue, pending appropriations.

Comment 10.6: Ropeless gear regulations will be difficult to impossible to enforce.

Response: Currently ropeless fishing is conducted under EFPs or state authorizations to exempt fishermen from the fishery management regulations that require the use of buoy lines to notify mariners of the presence of fixed fishing gear. Conditions of authorization include notification of effort, monitoring and reporting. If a permittee does not abide by the terms of the permit, the permittee will be subject to enforcement action. As data is collected throughout the EFP process for ropeless gear, law enforcement has the opportunity to review that data. Lessons learned from ropeless testing will be incorporated into an enforcement strategy in the event that ropeless technology is authorized for use in the fishery.

Comment 10.7: For ropeless fishing to work, we will need a new trap allocation system. There are too many traps in the water for ropeless to work.

Response: We recognize that feasibility in terms of both affordability and effective avoidance of gear conflicts will be most challenging in areas of dense fishing effort. A number of studies have demonstrated that effort reduction could be done without substantial economic impacts, see for example, Myers and Moore (2020) and Acheson (2013). Commenters including fishermen have suggested that a reduction in traps would provide fast and effective risk reduction. Less rope might ameliorate the need for further measures in some areas, and would reduce the cost of any future broadscale implementation of ropeless fishing.

Comment 10.8: NMFS received several comments on space-sharing to address potential gear conflicts associated with ropeless gear. One commenter suggested that NMFS should not require trap fishermen and mobile gear fishermen to undertake space-sharing negotiations themselves. The other commenter suggested the use of seasonal areas for different gear types.

Response: If broad adoption of ropeless fishing methods is considered and area management is deemed essential for success in preventing gear conflicts, NMFS anticipates that engagement and collaboration with the fishery management councils and commissions would be required to successfully design and implement any area-based management following fishery management public processes. This is well beyond the scope of what is being implemented by this rule.

Comment 10.9: NMFS should fast-track and simplify permitting to make ropeless fishing an easier option for fishermen.

Response: The provisions within this rule expand fishermen's options and provide incentives to fish with ropeless gear in an area otherwise restricted under the ALWTRP. The NMFS Greater Atlantic Region Fisheries Office is considering conducting an Environmental Assessment (EA) identifying and analyzing ropeless fishing under EFPs, including measures to minimize environmental impacts. The EA would facilitate development of EFP requests and reduce the need of the applicant for separate environmental analysis, expediting the EFP process substantially. The Northeast Fisheries Science Center has developed a "gear library" for collaborating fishermen to access ropeless gear and virtual gear marking technology. We expect to continue to learn about the feasibility of ropeless gear on a broader scale as more fishermen take advantage of the opportunity to try ropeless. If operational challenges including surface markings are overcome, NMFS would work with the Council to determine if fishery management regulations could be modified to not require buoy lines, allowing ropeless fishing without an EFP.

Comment 10.10: NMFS should develop a comprehensive roadmap for fishermen to permanently transition to ropeless gear so that they can continue to fish without endangering right whales. Relying on EFPs is not a long-term solution.

Response: NMFS is currently developing a "Roadmap to Ropeless Fishing" comprehensive plan to document the agency's approach to researching and testing ropeless gear. This plan will also include economic analyses and potential policy pathways of ropeless fishing, along with identifying partners and establishing short and long-term goals for ropeless research and development

Comment 10.11: For ropeless to work, there needs to be a single universal platform for all devices, so that all fishermen may see other's gear and locate their own.

Response: Ropeless gear and the technologies enabling it have evolved rapidly in recent years. If ropeless fishing continues to develop, other technologies platforms such as those to view the location of set ropeless gear and to prevent gear conflicts and facilitate law enforcement, will need to develop concurrently.

Comment 10.12: NMFS should establish additional ropeless restricted offshore areas, and require the offshore fishery to transition to ropeless gear within three years.

Response: We will continue to evaluate the latest population abundance, mortality and serious injury, and PBR estimates calculated for large whales to inform the risk reduction targets that we provide to the ALWTRT. As we work to reduce lethal entanglement risk as required by the MMPA, we will continue to convene the Team to analyze the latest data and to make recommendations to us as to how best to fulfill these goals.

Comment 10.13: Due to the high incidence of right whales in Cape Cod Bay from February to May, we recommend that NMFS not permit testing of ropeless fishing systems during these times.

Response: We recognize that in some areas at some times, like Cape Cod Bay in late winter/early spring, any additional risk to right whales (increased vessel traffic, etc.) may be unacceptable. These risks may be evaluated and avoided or mitigated on an individual basis as applicants seek EFPs for ropeless experimentation within ALWTRP restricted areas.

Comment 10.14 There is no way to implement ropeless in the gray zone, where Canadians are also setting their gear.

Response: The rule does not require ropeless fishing in the gray zone or anywhere else.

Comment 10.15 Ropeless fishing will still put thousands of end lines in the water column, but without tension on them, posing a greater risk for all marine mammals and boaters.

Response: Ropeless fishing as it is currently being tested would only result in buoy lines in the water column when a fishing vessel is on site to retrieve the trawl. While we agree that operationalization of a ropeless fishery will require much more planning and evaluation in the future, ropeless vertical lines would spend a significantly lower proportion of time in the water column than a traditional fixed vertical line with a surface buoy. This would significantly lower exposure to marine mammals and therefore significantly lower entanglement risk.

Comment 10.16: NMFS erred in asserting that ropeless gear should be considered "neutral risk" as sinking groundline may still pose a risk to large whales. While ropeless gear is not expected to be widely used in the immediate future, technology may advance to make it more feasible, and so NMFS should re-evaluate the risk posed by the gear.

Response: To date, evidence of sinking groundline in large whale entanglements is limited, though we continue to investigate as the scarce data and opportunities allow. The discussion in the FEIS was modified per comments about possible addition of risk in areas where none currently occurs in existing closed areas. The qualitative discussion of risk including anticipated conditions while ropeless fishing is developed is summarized in the FEIS Section 5.3.1.1.2.1.2.

1.1.12 Stressors on Right Whales

Dozens of commenters suggested a variety of factors that may be contributing to right whale decline, with many fishermen pointing to other known and possible causes of mortality. These commenters stated or suggested that this regulation will not contribute to the recovery of right whales due to issues beyond the scope of this rulemaking. Among the issues raised are climate change, disease, pollution, inbreeding/small population size, previous entanglements, sonar, noise, oil spills, plastic pollution, shark predation on calves, vessel strikes, and offshore wind. The Final Rule and analyses in the FEIS are related to amendments to the Plan. The Plan and the take reduction process are restricted to monitoring and mitigating incidental mortality and serious injury of marine mammals incidental to particular U.S. commercial fisheries. The majority of these issues are outside the scope of this regulation, and many are beyond the authority of the NMFS but given the frequency with which these issues were introduced, we have provided some answers below.

Comment 11.1: Climate change/global warming is primarily to blame for the decline of right whales, and it has nothing to do with fishermen.

Response: The effects of climate change may have led to a shift in the distribution of right whales sometime between 2010 to 2013. This distribution shift increasingly brought right whales into areas of greater risk from human activities, including fishing. Entanglement in fishing gear is one of the primary causes of serious injury and mortality in right whales. See FEIS Section 1.1 for an overview.

Comment 11.2: Since the right whales have found their food sources in the Gulf of St. Lawrence, they are thriving again and this rulemaking is unnecessary.

Response: NMFS disagrees. Since the population started regularly using the Gulf of St. Lawrence, the population has declined by 23 percent overall, and roughly 200 right whales have died, many of them outside the Gulf of St. Lawrence. Threats to right whales are spread across their range in U.S. and Canadian waters.

The need to amend the ALWTRP is driven by the average reported mortality and serious injury to right whales due to fishery entanglement compared to PBR is 0.8 per year and, unfortunately, fishery entanglement-related mortality and serious injury is 5.55 whales per year (Hayes et al. 2020). Since fishery entanglement-induced mortality and serious injury exceeds PBR, this rule is necessary.

Comment 11.3: NMFS should consider the effects of disease and increased pollution on right whales.

Response: NMFS agrees. In NMFS' Species in the Spotlight North Atlantic right whale five-year action plan, one of the five priorities identified for the next five years to halt the decline of this species is to "Investigate North Atlantic Right Whale Population Abundance, Status, Distribution and Health." NMFS also convened a 2019 Health Assessment Workshop to help evaluate current health information data, including associated data gaps, and identified appropriate available and needed tools and techniques for collecting standardized health data that can be used to understand health effects of environmental and human impacts, and inform fecundity and survivorship models to ultimately guide right whale recovery (Fauquier et al. 2020). The Species in the Spotlight North Atlantic right whale five-year action plan is available online at *www.fisheries.noaa.gov/resource/document/species-spotlight-priority-actions-2021-2025-north-atlantic-right-whale.* Please see Chapter 8 of the FEIS, which has a summary of Cumulative Effects.

Comment 11.4: Right whales are suffering from inbreeding, and will never be able to have a viable population again, so there is no point to these regulations.

Response: Small population sizes may carry some greater risk of inbreeding as a potential limiting factor to recovery, however, there is evidence that natural populations have mechanisms to reduce the loss of genetic diversity (Frasier et al. 2013). Additionally, the North Atlantic right whale population has continued to produce healthy whales despite the relative low level of genetic variability when compared to other large whales, a condition that has apparently been sustained since the 16th century (McLeod et al. 2009). Numerous mammalian species have recovered from much smaller population sizes than the North Atlantic Right whale population, including Northern Elephant seals and gray seals in New England. Many of the great whale populations were decimated by the end of commercial whaling and most have recovered. Despite being reduced to about 260 right whales alive in 1990, North Atlantic right whales were genetically sound enough to recover, albeit slowly due to persistent human impacts, until peaking at 481 individuals in 2010. After 2010, the change in habitat use that involved more regular excursion into areas where management protections were not in place. This resulted in increased human-caused mortality and additional stresses, including both environmental food limitations and increased non-lethal entanglement. Together these stressors are likely contributing to documented reduced caving rates. While inbreeding could play a negative role here, there is little evidence to support that theory. After accounting for human-caused mortality, the 1990-2010 calving rates and population growth rates were well within normal cetacean population demographic rate. The changes in those rates since 2010 may be driven by increased anthropogenic mortality and climate change.

Comment 11.5: After vessel strikes, industrial sonar and ocean noise are the greatest threats to right whales. Has there been any research on the effects of Naval use of sonar in training, and the effects of ocean noise generally, on the increase or decrease in entanglements?

Response: We are not aware of any studies evaluating the correlation between ocean noise and rates of entanglement in fishing gear. However, given that right whales are not detecting fishing gear acoustically, it would seem highly unlikely that ocean noise levels would directly affect or have any relationship to entanglement rates. Furthermore, while increases in ocean noise is of concern for the communication ability for right whales and many other species, these effects are generally "sub-lethal," whereas entanglement in fishing gear can lead directly to serious injury and mortality.

Comment 11.6: Did the 2010 BP Deepwater Horizon oil spill in the Gulf of Mexico or a change in food source affect right whale birth rates?

Response: NMFS is not aware of any studies, data, or evidence that suggest right whales have been affected by the BP Deepwater Horizon oil spill. For information on factors that may affect birth rates, see Chapter 8 of the FEIS, which has a summary of Cumulative Effects.

Comment 11.7: NMFS should consider the environmental impact of the consumption of additional plastic products this rule will require.

Response: This rule is not likely to change the need for ropes or weak links made from plastic material. The Final Rule may temporarily increase the production of new inserts, which may have plastic components, but ultimately would decrease with the reduction of gear in the water. Please see Chapter 5 and for a description of indirect effects, the likelihood of ghost gear, and frequency of gear replacement, as well as Chapter 8 for our Cumulative Effects Analysis.

Comment 11.8: NMFS should consider the role of seismic testing in right whale population declines.

Response: Seismic survey operators for oil and gas exploration require permits from the Bureau of Ocean Energy Management (BOEM). As part of issuing these permits, BOEM consults with NMFS under Section 7 of the ESA to ensure the proposed action (i.e., the seismic surveys) does not jeopardize the continued existence of any ESA listed species, including North Atlantic right whales. Through this process, NMFS fully evaluates the potential impacts of seismic testing on the right whales (e.g., Biological Opinion on the Bureau of Ocean Energy Management's Issuance of Five Oil and Gas Permits for Geological and Geophysical Seismic Surveys off the Atlantic Coast of the United States, and the National Marine Fisheries Services' Issuance of Associated Incidental Harassment Authorizations at *https://repository.library.noaa.gov/view/noaa/19552*). Seismic surveys for other purposes such as those conducted by the National Science Foundation or the United States Geological Survey for research purposes also require the same type of consideration under Section 7 of the ESA (e.g., Biological Opinion on a National Science Foundation-funded seismic survey by the Scripps Institution of Oceanography in the South Atlantic Ocean, and Issuance of an Incidental Harassment Authorization pursuant to section 101(a)(5)(D) of the Marine Mammal Protection Act by the Permits and Conservation Division, National Marine Fisheries Service at https://repository.library.noaa.gov/view/noaa/22585). Finally, any take of marine mammals that is likely to occur as a result of these seismic surveys requires authorization under the MMPA (e.g., Incidental Take Authorization: Oil and Gas Industry Geophysical Survey Activity in the Atlantic Ocean at *https://www.fisheries.noaa.gov/action/incidental-take-authorization-oil-and-gas-industry-geophysical-survey-activity-atlantic*), and as part of this authorization, NMFS also analyzes impacts to marine mammal population stocks, including right whales.

Under both the MMPA and ESA, in authorizing take of marine mammals including right whales, NMFS requires mitigation and monitoring as well as terms and conditions to monitor and reduce the impacts from such take. However, it is important to note that there is no concrete evidence that seismic surveys are likely to have any population level effects on large baleen whales such as right whales. Furthermore, the impacts of seismic surveys on the vital rates (e.g., survival, reproduction, growth) of individual baleen whales are not well understood, but current evidence does not support that they cause serious injury, mortality, or lower reproduction. Finally, at present, and in the recent past, there is very little seismic survey activity in the U.S. Atlantic Ocean other than infrequent surveys conducted for scientific research purposes that typically use lower source level (i.e., quieter) airguns as compared to the louder oil and gas exploration surveys such as those in the Gulf of Mexico.

In summary, NMFS does evaluate impacts from seismic surveys on right whales and while there have been and currently are few surveys being conducted, through the MMPA and ESA ensures that such surveys are not furthering the decline of the population.

Comment 11.9: Many commenters voiced their concern that recent right whale mortalities and serious injuries were due to vessel strikes, and suggested that vessels should be a higher priority for NMFS than reducing entanglements in fishing gear. Several commenters pointed out that more right whale calves were born this year, a year in which the cruise ship industry was largely shut down due to the global pandemic, than in any recent years. Others raised concerns about mortalities and serious injuries caused by Naval, whale watch and shipping industry vessels. Many commenters favored expediting updated regulations on vessel speeds, including in shipping lanes.

Response: Right whales are particularly vulnerable to vessel strikes due to their use of coastal habitats and frequent occurrence at near surface depths. Furthermore, they are vulnerable to strikes by nearly all types and sizes of vessels operating within the whales' range. In 2008 (73 FR 60173, October 10, 2008), NMFS implemented regulations requiring most vessels equal to or greater than 65 ft in length to transit at speeds of 10 knots or less in designated Seasonal Management Areas (SMAs) along the U.S. East Coast. Concurrently, NMFS initiated a voluntary Dynamic Area Management (DMA) speed reduction program to provide additional protection for aggregations of right whales outside of active SMAs. To reduce the spatial/temporal overlap of whales and vessel traffic NMFS established recommended routes for vessels transiting Cape Cod Bay and into/out of ports in northern Florida and Georgia, and modified the shipping lane approaching the port of Boston.

In January 2021, NMFS released an assessment evaluating the conservation value and economic and navigational safety impacts of the speed rule (50 CFR § 224.105). While the assessment is considered final, we sought comments on the report findings through March 26, 2021, as we evaluate the need for future action and modifications to the existing speed regulations.

The report evaluates four aspects of the right whale vessel speed rule: biological efficacy, mariner compliance, impacts to navigational safety, and economic cost to mariners. It also assesses general trends in vessel traffic characteristics within SMAs over time, provides a detailed assessment of the speed rule's effectiveness and offers recommendations for strengthening the rule based on these findings. In addition to the assessment of the vessel speed rule, the report also evaluates mariner cooperation with the DMA program and investigates small vessel transit patterns through active SMAs

NMFS is evaluating whether further efforts are needed to minimize the spatial overlap of right whales and vessel traffic and reducing the speed of vessels transiting through right whale habitat remain the most viable options to reduce vessel strikes in U.S. waters. The review and information collected during public comment will be used to consider whether current measures are appropriate given recent shifts in right whale distribution. For more information, please see Chapter 8 of the FEIS, which has a summary of Cumulative Effects.

Comment 11.10: Many fishermen commented that they feared offshore wind energy projects would displace them, and questioned NMFS' role in permitting offshore wind energy projects.

Response: BOEM is the lead federal agency and primary decision-maker for offshore wind development projects. NOAA works with BOEM and offshore wind developers to provide information and consultation on how offshore wind projects may affect endangered or threatened species, marine mammals, fisheries, marine habitats, and fishing communities. Each proposed project is evaluated individually, with opportunities for public input, which can be found on the BOEM website. NOAA's engagement on offshore wind activities is limited to our authorities under the NEPA, the ESA, the MMPA, and the MSA. Further information on NOAA's role in offshore wind development can be found on our website at *fisheries.noaa.gov/new-england-mid-atlantic/science-data/offshore-wind-energy-development-new-england-mid-atlantic-waters*.

1.1.13 Trawls

Many of the campaign commenters as well as 38 of the unique commenters supported trawling up as a way to reduce the number of vertical lines in the water, while 52 unique commenters disagreed, saying that trawling up is may instead result in more severe entanglements and more danger to fishermen. Comments from NGOs and members of the public indicated concern about whether heavier trawl lines would increase the severity of entanglements. Fishermen voiced concerns about the specifics of trawling up requirements in particular areas. Several fishermen supported the option of splitting buoy lines, and having only one line on a trawl. Some fishermen were concerned that trawling up would have an impact on landings.

Comment 12.1: A 50 percent vertical buoy line reduction mandate would harm smaller vessels and lead to consolidation of the fishery.

Response: A 50 percent vertical line reduction is a measure in the non-preferred alternative, and is not be implemented under this final rule. See FEIS Chapter 2 for more details.

Comment 12.2: Trawling up is expensive, and will put some fishermen out of business.

Response: The Final Rule provides conservation equivalencies to provide more flexibility to fishermen. We expect these options to help fishermen choose the options that minimize their economic impacts. We understood from Maine DMR that the trawling up configurations developed through collaborations with Zone Councils were selected because fishermen could do them with minimal investment in time or new gear relative.

Comment 12.3: What will the effects of trawling up be on landings?

Response: The effects will depend on several factors, including the increase in the number of traps per trawl. For vessels trawling up fewer than 2 traps per set, we would expect to see a reduction rate of 0-5 percent on landings. For vessels trawling up 2 or more traps per set, we expect the landing reduction rate to be 5-10 percent. See FEIS Chapter 6 for more details including a summary of the limited previous investigations into the impacts of trawling up on catch rates.

Comment 12.4: NMFS should allow different trawls lengths depending on vessel sizes, vessel configurations (open/closed transom or equipment placement), distance from shore, and fishing depth. Several specific requests were submitted, such as four traps per trawl measure in New Hampshire waters, one buoy line along the northern edge of Georges Bank, and triples in the “sliver” area.

Response: The Final Rule establishes varying trawl lengths (traps per trawl), primarily by distance from shore. These are based on measures proposed by the ALWTRT, states, conservation equivalencies requested, and comments received during scoping and rulemaking. Configurations by distance from shore were considered likely to parallel vessel sizes, with smaller vessels operating closer to shore. Trawling up requirements by vessel size or configuration would be difficult to implement, enforce, and evaluate.

Comment 12.5: NMFS should exempt waters from 50 fathoms (91 meters) and deeper along the continental slope from trawling up.

Response: The Final Rule implements a less restrictive trawling up requirement for vessels fishing in waters deeper than the 50 fathom curve south of Georges Bank (35 traps per trawl) than was initially proposed (45 traps/trawl) in response to conservation equivalency requests from the Atlantic Offshore Lobster Fishermen’s Association. There is no information to suggest that right whales and other large whales are not entangled in waters deeper than 50 fathoms therefore an exemption from trawling up requirements without a concurrent line or risk reduction alternative would not provide sufficient risk reduction.

Comment 12.6: NMFS should consider the 3 mile zones around Matinicus and Ragged Islands to be the same as other Maine coastal areas, and regulate them as such.

Response: As noted below in this rule, there is an island buffer for this fishing in waters within 1/4 nautical miles of the following Maine islands are exempt from the minimum number of traps per trawl requirement in paragraph (c)(2)(iv) of this section: Monhegan Island, Matinicus Island Group (Metinic Island, Small Green Island, Large Green Island, Seal Island, Wooden Ball Island, Matinicus Island, Ragged Island), and Isles of Shoals Island Group (Duck Island, Appledore Island, Cedar Island, Smuttynose Island).

Comment 12.6: The problem with using only one buoy line is that other fishermen won’t be able to tell where my gear is, more catch-downs, and losing the ability to haul in a certain direction because of the wind.

Response: Area-specific allowances of up to ten traps per trawl with one buoy line was requested by Maine DMR, after discussion with the Zone Councils, as a conservation equivalency that would allow fishermen to fish shorter trawls while still reducing the number of buoy lines. Because this change is restricted to Maine Zones at the request of Zone Councils, it may reflect vessel capacity and current fishing practices. However, as occurs whenever measures are modified, there will be a transition period as fishermen adjust to new measures that the fishing community will likely work out relative to issues of gear placement and safety.

Comment 12.7: Trawling up increases chances of gear conflicts due to longer lines.

Response: The impact of minimum trawl length requirements on gear loss in trap/pot fisheries is difficult to predict with confidence. The uncertainty is largely attributable to the array of underlying factors responsible for gear loss. On the one hand, longer trawls may increase the likelihood that groundline will foul on bottom structure, increasing the potential for line to part while hauling traps. Longer trawls may also increase the potential for gear conflicts, particularly situations in which one fisherman’s gear is laid across another’s. This could be exacerbated by the Maine conservation equivalencies which will allow fishermen in some Maine Lobster Zones to fish trawls of up to 10 traps with only one buoy line. Overlain gear can cause one party to inadvertently sever another's lines, making it impossible to retrieve all or some of the gear. A longer trawl also increases the consequences of such incidents; i.e., the more gear on a single trawl, the more gear is lost when that trawl is rendered irretrievable.

In other ways, trawling requirements may reduce the potential for gear loss. The fundamental objective of longer trawls is to limit the number of buoy lines in the water column and reduce encounters with large whales; such encounters are one possible source of gear loss. Likewise, a decrease in the number of buoy lines may reduce the frequency with which gear is entangled in vessel propellers or mobile fishing gear. Furthermore, in areas where trawling up requirements necessitate addition of a second buoy line (e.g., for configurations greater than 20 traps or a vessel going from triples to ten-trap trawls), the second buoy line may make it easier to locate and retrieve gear when one buoy line is lost. Longer trawls are also heavier and may be less likely to be swept away during extreme storm or tidal events. For more, see FEIS Section 6.2.6.1.

Comment 12.8: NMFS should not leave it to fishermen to develop agreements between large and small boats to set trawl lengths that would meet an overall goal of line reduction, as this would be difficult to evaluate and enforce.

Response: Agreed. The Final Rule does not implement any regulations based on boat length or size.

Comment 12.9: Trawling up leads to longer, heavier lines that pose a greater risk to right whales, causing worse and heavier entanglements.

Response: While we recognize that the trawls will be longer, for many of the configurations, the portion of the trawl hanging in the water column and putting force on the hauling rope is based on water depth and distance between traps rather than wholly on trawl length and the configuration changes may not substantially change that. Many of the configurations adapted were proposed by fishermen during scoping and were proposed because they can be fished using existing rope and do not require a turnover in buoy lines currently being fished. Finally, every buoy line will be fished with weak insertions or weak rope. In a 2016 study, Knowlton et al. showed evidence that 1,700 lb weak links within buoy lines or 1,700 lb weak line will allow whales to part the gear and reduce the likelihood of serious injury. Trawling up reduces the chance of an entanglement as fewer buoy lines will be present in the water column. The combination of these two measures will reduce the threat of mortality and serious injury of entanglement for large whales.

Comment 12.10: Many fishermen voiced safety concerns about trawling up, including not having enough room on their vessel for 45 traps, that the increased weight of the vessel could lead to greater danger of capsizing in bad weather, and that longer lines may injure and entangle the crew.

Response: Throughout the development of the Final Rule, we have taken safety considerations into account in identifying alternatives. Several proposed measures were rejected in whole or in part due to safety concerns. See Table 3.4. Conservation equivalencies adopted in the Final Rule better accommodate small scale fishing operations and traditional practices, considers fishing safety concerns, and requires less costly gear modifications.

Comment 12.11: NMFS should require all trap/pot vessels be rigged for trawl nets or aluminum beam trawl type equipment, and cease to allow trap/pot gear with buoy lines.

Response: NMFS does not have the authority under either the ACA or MSA to unilaterally require trawl gear in all fisheries. The ACA directs the federal government to support the management efforts of the Atlantic States Marine Fisheries Commission and, to the extent the federal government seeks to regulate a Commission species, develop regulations that are compatible with the Commission's Interstate Fishery Management Plan and consistent with the MSA's National Standards. The Commission's Interstate Fishery Management Plans for lobster and Jonah crab specifically contemplate the use of trap/pot gear. NMFS would not have the authority to implement a requirement to prohibit trap/pot gear and require trawl gear without such a measure being incorporated into the Interstate Plan and recommended by the Commission. Similarly, the MSA charged regional fishery management councils with developing fishery management plans that meet the requirements of the Act. Under the MSA, the Secretary shall approve, disapprove, or partially approve a plan or management action developed by the Councils. Unless and until the Mid-Atlantic and New England fishery management councils modify gear requirements for their fishery management plans, NMFS is not authorized to take action under the MSA.

Comment 12.12: NMFS should focus on keeping tension in buoy lines and reducing length between surface buoys to 3-4 feet (0.91-1.2 meters) to reduce entanglements of all marine mammals.

Response: Documentation from entanglements indicates that buoy lines and unknown lines represent the majority of interactions. Surface system direct interactions are rarely documented.

Current industry practice and the ALWTRP already requires the use of sinking line on the top of buoy lines to reduce floating line at the surface. Under many conditions, fishermen also minimize scope in their buoy lines to prevent the lines from interacting with nearby set gear, although in areas of high tidal range and currents, more scope may be needed.

The Final Rule reduces the possibility of entanglements by using a combination of closed areas, trawling up (less buoy lines in water column), weak line, weak insertions, and weak contrivances.

1.1.14 Weak Rope/Links/Inserts

More than 71 of the unique commenters supported the use of some form of weak rope to reduce the severity of right whale entanglements in fishing gear, while thousands of campaign comments and 144 unique commenters noted that weak rope may not reduce entanglement events and may still have detrimental effects on juveniles and calves, as well as cause sublethal effects to adults. Many fishermen are concerned that weak rope will result in gear loss, which will result in economic losses to them and increase the amount of ghost gear, which poses an entanglement risk to right whales.

Comment 13.1: Many commenters had questions or concerns about weak link locations, configurations, and surface systems.

Response: We received dozens of comments questioning the reasons for locations of the weak links/inserts, suggestions for other configurations of weak points, and the effectiveness of weak links/inserts, particularly the 600 lb weak link, in reducing right whale entanglements. We also received dozens of suggestions for different options for weak links/inserts, including but not limited to, knots, time tension line cutters, loops and tucks, eye splices with sheep bends, and Novabraids. We received several suggestions regarding surface systems, with some commenters suggesting that they be eliminated, others wanting to keep them, and some asking for evidence that they are effective at reducing entanglement.

For reasons specified in FEIS Section 3.3.3, we removed the requirement for lobster and

Jonah crab fishermen to connect their buoy to the buoy line using a weak link because the new measures require using weak rope or weak insertions in the buoy line. For our evaluation of surface system weak links, please see FEIS Section 3.3.3.1.

Comment 13.2: Many commenters had questions or concerns about safety and economic loss related to weak inserts, link, or Rope. Fishermen were particularly concerned that weak rope and weak inserts may result in injuries to fishermen and economic impacts due to lost gear.

Response: Forces on lines hauling up lobster trawls were measured during commercial operations. Forces greater than 1,700 lb (771.1 kg) breaking strength were required to retrieve gear, particularly for trawls of 35 traps and more in waters greater than 50 fathoms (91.4 m) (Maine DMR 2020). Timed haul data indicated those higher forces were not detected on the line until well past halfway through hauling the buoy line (for example, Figure 7 in Maine proposal, Appendix 3.2). This suggests that under most operational conditions, weak rope or a weak insertion within the top half of a buoy line would not be subjected to forces approaching or greater than 1,700 lb (771.1 kg) during a haul. This is consistent with modeling work conducted by Knowlton et al. (2018) who demonstrated that operational changes in fishing practices to minimize speed and the amount of gear in the water column would further minimize rope tensions. In field work conducted by Knowlton et al. (2018), gear loss for buoy ropes using Novabraid sleeves inserted every 40 feet throughout the buoy lines fished in waters from 42 to 310 feet (12.8 to 94.5 m) was not significantly different than gear loss using standard buoy lines. The Final Rule does not require the configuration studied by Knowlton et al. (2018), and while that means that the final configurations do not get the level of risk reduction that would be achieved through their experimental configuration, the measures reduce the likelihood that weak insertions will occur where forces may exceed the breaking strength of the rope. That compromise is intended to minimize safety risks to fishermen and economic impacts of increased gear loss. For more, see FEIS Section 3.3.3.2.

Comment 13.3: Many commenters had questions or concerns about the effects of weak inserts and weak rope on right whales.

Response: Conservationists voiced concerns that weak rope wouldn't reduce the risk of entanglement, and would still cause sublethal effects to adults, and could cause lethal effects to juveniles and calves. There were also suggestions that weak rope will hamper disentanglement teams and could result in more right whale mortalities and serious injuries. Some commenters questioned our analysis of the spacing, particularly concerning why we elected to use weak insertions every 40 feet as equivalent to weak rope.

We evaluated weak line relative to the findings of Knowlton et al. (2016), which documented that no ropes retrieved from entangled right whales of all ages had breaking strengths that were below 7.56 kN (1,700 lb). Knowlton et al. (2016) suggest that right whales can break free from these weaker ropes before a serious injury occurs. This is consistent with estimates of the force that large whales are capable of applying, based on axial locomotor muscle morphology study conducted by Arthur et al. (2015). The authors suggested that the maximum force output for a large right whale is likely sufficient to break line at that breaking strength. That study and others recognized that a whale's ability to break free from an entanglement is also somewhat dependent on the complexity of the entanglement configuration (van der Hoop et al. 2017).

The research available suggests that a full-length weak line provides the maximum precautionary benefit to whales (Knowlton et al. 2016, DeCew et al. 2017). However, when full weak rope is not readily available or when replacement of an entire buoy line is not feasible, weak links are also effective at reducing breaking strength. To evaluate the risk reduction benefit of weak rope alternatives, we compared the relative risk reduction achieved from a rope with one or two weak inserts at particular buoy line depths to a rope with inserts at regular intervals of 40 feet. We selected 40 feet intervals based on the work of Knowlton et al. (2016 and 2018) which was selected because it was within the range of a right whale's girth and length, is within the range of rope length typically removed from entangled whales and was the configuration discussed most directly by the Team when considering weak rope. Spacing of every 40 feet provides the greatest benefit to whales, since entanglements can be very complex, and inserts every 40 feet provide the greatest likelihood that at least one weak point will be present on an entangled whale, allowing it to break the rope. Weak line models suggest that weak points will not necessarily benefit a whale that encounters the rope below the weak point, particularly with a heavy trawl. The lower the lowest weak insertions, the higher the potential for the rope to part (DeCew et al 2017). See Chapter 3 for a more detailed description of the calculations of the proportional risk reduction estimated for inserts that were not at regular intervals, and how we determined the measures included in the Final Rule.

We agree that there may be added or reduced risk reduction to whales depending on how weak insertions are configured. The greater the number of weak points on a line, the greater the likelihood that a weak point will be located below where the whale encounters the line, and that there will be a weak insertion outside of the mouth where the whale may have a better chance of breaking free from the entanglement. Configurations that are knot-free may also pose less risk. Gear that is knot-free, and/or free of attachments may be less likely to get caught in baleen if a mouth entanglement occurs, more likely to slide through the whale's baleen without becoming lodged in the mouth or elsewhere, decreasing the risk of serious injury or mortality. However there is evidence that splices and knots introduce weaknesses into buoy lines. Lines undergoing breaking strength testing broke on the smaller or weaker side of a knot or splice (Maine DMR 2020).

We evaluate risk reduction under the assumption that weak rope is not zero risk to whales and that few insertions do not provide the risk reduction benefits of fully weak rope or weak rope with insertions every 40 feet. However, in concert with the other measures in the Final Rule, NMFS believes that it will achieve the required levels of risk reduction and applies a precautionary measure across the Northeast Region. For more on our analysis, see FEIS Section 3.3.4 and Appendix 3.1.

Comment 13.4: Commenters indicated current buoy weak link requirements should be rescinded. Reasons included: to retain buoy to increase our ability to identify fishery and location of incidents, so buoy drag in concert with weak rope or weak inserts in buoy line can pull parted gear free from whales, to improve visibility to disentanglement teams.

Response: The Final Rule rescinds buoy weak link requirements for Northeast Region lobster and Jonah crab buoy lines that require weak rope or weak inserts in the buoy line. See Chapter 3 of the FEIS for a discussion of this modification.

Comment 13.5: The weak rope equipment suggested as an alternative in the Proposed Rule has not been proven to effectively reduce harm to right whales. In fact, many fishermen have stated that they will use more rope if the weak rope requirement is implemented, overall increasing the likelihood of entanglements.

Response: For LMA 1 fishermen, the weak rope/weak insertion measures were proposed by Maine DMR after extensive outreach with Maine fishermen. The insertion locations are informed by research done by Maine DMR measuring at what point the forces on rope when trawls are hauled in exceed 1,700 lb (771.1 kg). Insertion locations were selected for placement in the buoy line above that point. Fishermen indicated a preference for a solution that would not require them to purchase additional rope, suggesting that most fishermen do not anticipate purchasing more rope other than the short lengths needed to create weak insertions, adding only three to six feet to the amount of buoy line already fished.

See FEIS Section 3.3.42, Knowlton et al. (2016) and Arthur et al. (2015) for evidence indicating large whales including right whales can break free of rope with breaking strengths below 1700 lb, reducing opportunity for serious injury and mortality.

1.1.15 Outside Scope

As noted above, we received dozens of comments that were outside the scope of the current rulemaking. The Final Rule and analyses in the FEIS are related to amendments to the Plan. The Plan and the take reduction process are restricted to the monitoring and management of incidental mortality and serious injury of marine mammals in U.S. commercial fisheries. Because these comments were out of the scope of the Final Rule and the FEIS, we did not provide responses in this document. A list of the out of scope comments appears below.

1. NMFS or the states should institute a lobster and crab tax or other funding mechanism to make up for the economic deficit caused by the regulations.
2. The Economic Impact Analysis produced by Nathan Associates incorrectly states that the Casco Bay Lines ferry to Long Island has 24 daily runs year round, casting doubt on NMFS' entire economic analysis.
3. We are concerned that the Agency's broad assumptions may unnecessarily alarm industry members and their families.
4. NMFS should monitor the travel routes of whales and enforce all regulations that might impact whales, such as ocean dumping.
5. NMFS and states should work with manufacturers to produce ropes in a single color to match state requirements, which would reduce the difficulty of maintaining marks at the designated increments for fishermen moving to different depths.
6. NMFS should use emergency action to close all high seas transport to allow right whales to recover.
7. NMFS should not issue incidental take permits for right whales under the ESA.
8. Several commenters submitted recommendations on gillnet and other mobile gear configurations, which are not the subject of this rule, but may be considered by the ALWTRT in the future.
9. Expand and strengthen response networks comprising researchers, environmental organizations, industry groups and stakeholders, and government decision-makers to help manage the crisis and start rebuilding the population.
10. The percentage of vertical lines proposed to be reduced (60% up to 98%) in the Biological Opinion was not derived based on any scientific findings.
11. NMFS should study the effects of the rebounding white shark populations on the survival of right whale calves.
12. NMFS should seriously consider a seal cull to mitigate the extensive ongoing, damage being done to numerous fish species, particularly striped bass stocks in the New England region.
13. Vessels should be outfitted with pingers to deter right whales from being near vessels.

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CHAPTER 2 APPENDICES

Appendix 2.1 Current ALWTRP Requirements Summary

(see 50 CFR Section 229.32 for complete and current regulations)

2.1.1 *Trap/Pot Gear Modification Requirements and Restrictions under the ALWTRP*

Trap/Pot Universal Requirements

- No buoy line floating at the surface.
- No wet storage of gear (all gear must be hauled out of the water at least once every 30 days).
- Fishermen are encouraged, but not required, to maintain knot-free buoy lines.
- All groundlines must be made of sinking line.
- Northeast and Mid-Atlantic: Trawls with less than or equal to 5 traps may only possess 1 buoy line, except in MA state waters. In MA, 3 traps or less must have 1 endline.

Trap/Pot Weak Link Requirements

- All buoys, flotation devices and/or weights must be attached to the buoy line with a weak link having a certain breaking strength as defined for each management area on the following pages.
- Weak links must be chosen from the list of NMFS approved gear, which includes: off the shelf weak links, rope of appropriate breaking strength, hog rings, and other materials or devices approved in writing. Weak links must be designed in such a way that the bitter end of the buoy line is clean and free of any knots when the weak link breaks.

Trap/Pot Gear Marking Requirements

- Trap/pot surface buoys to be marked to identify the vessel or fishery with one of the following: the owner's motorboat registration number and/or U.S. vessel documentation number; the federal commercial fishing permit number; or whatever positive identification marking is required by the vessel's home-port state.
- When marking is not already required by state or federal regulations, the letters and numbers to mark gear must be at least 1 inch (2.5 cm) in height, block letters or Arabic numbers, in a color that contrasts with the color of the buoy.
- Buoy lines are to be marked with three 12 inch (30.48 cm), colored marks: one at the top of the buoy line, one midway along the buoy line, and one at the bottom of the buoy line.
- If the mark consists of two colors, EACH COLOR mark may be 6-inches for a TOTAL MARK of 12- inches.
- Color requirements are defined for each individual management area as described in each management area description that follows.

Massachusetts Restricted Area

<u>February 1 – April 30</u> • CLOSED to ALL trap/pot fishing

<u>May1 – January 31</u>
- Universal requirements
- Gear marking – RED or the following colors for minimum trap per trawl exemption areas
  - Single traps in exempted MA State waters in LMA1- RED & WHITE
  - Single traps in exempted MA state waters in LMA 2 - RED & BLACK
  - Single traps in exempted MA state waters in Outer Cape - RED & YELLOW
- Weak links ≤ 600 lbs breaking strength
- Sinking groundline

Trap Restrictions
- MA State Waters – 2 or no minimum
- LMA 1 (3-12 miles) – 10
- LMA1/Outer Cape Overlap (0-3 miles), Outer Cape (0-3 miles) – no minimum
- Outer Cape (3-12 miles) – 10

Great South Channel Restricted Area

<u>April 1 – June 30</u> • CLOSED to ALL trap/pot fishing

<u>July 1 – March 31</u>
- Universal requirements
- Gear Marking – RED (areas overlapping LMA 2 and/or Outer Cape LMA), BLACK (areas overlapping LMA 2/3 Overlap and/or LMA3)
- Weak links no greater than 600 lb in area overlap with LMA2 and/or OC, and no greater than 1,500 lb. in areas that overlap with LMA 2/3 and/or LMA3
- Sinking groundline

Trap Restrictions
- Outer Cape (12+ miles) – 20
- LMA 2 (12 + miles) – 15
- LMA 2/3 Overlap (12+ miles) – 20
- LMA 3 (12+ miles) – 20

Stellwagen Bank/Jeffreys Ledge Restricted Area

<u>Year-round</u>
- Universal requirements
- Gear marking – RED or RED & GREEN if overlapping Jeffreys Ledge Gear Marking Area or the following colors for minimum trap per trawl exemption areas
  - Single traps in exempted MA State waters in LMA1 – RED & WHITE
  - Single traps in exempted MA state waters in LMA 2 – RED & BLACK
  - Single traps in exempted MA state waters in Outer Cape – RED & YELLOW
- Weak links ≤ 600 lbs breaking strength

- Sinking groundline

Trap Restrictions
- ME Zones A-G (3-6 miles) – 3
- ME Zones A-C (6-12 miles) – 5
- ME Zones D-G (6-12 miles) – 10
- ME Zones A-E (12+ miles) – 15
- ME Zones F-G (12+ miles) – 15 (Mar 1 – Oct 31), 20 (Nov 1 – Feb 28/29)
- LMA 1 (3-12 miles) – 10
- LMA 1 (12+ miles) – 20
- Outer Cape (3-12 miles) – 10
- Outer Cape (12+ miles) – 20
- LMA 2 (3-12 miles) – 10
- LMA 2 (12 + miles) – 15

Northern Inshore State Trap/Pot Waters

<u>Year-round</u>
- Universal requirements
- Gear marking – RED or the following colors for minimum trap per trawl exemption areas
  - Single traps in exempted MA State waters in LMA1 – RED & WHITE
  - Single traps in exempted MA state waters in LMA 2 – RED & BLACK
  - Single traps in exempted MA state waters in Outer Cape – RED & YELLOW
- Weak links ≤ 600 lbs breaking strength
- Sinking groundline

Trap Restrictions
- ME State and Pocket Waters – 2
- MA State Waters – 2 or no minimum
- NH State Waters, LMA1/Outer Cape Overlap (0-3 miles), Outer Cape (0-3 miles), & Rhode Island State Waters - no minimum

Northern Nearshore Trap/Pot Waters
<u>Year-round</u>
- Universal requirements
- Gear marking – RED or RED & GREEN if overlapping Jeffreys Ledge Gear Marking Area (page 30) or RED & PURPLE if overlapping Jordan Basin Gear Marking Area
- Weak links ≤ 600lbs breaking strength
- Sinking groundline

Trap Restrictions
- ME Zones A-G (3-6 miles) – 3
- ME Zones A-C (6-12 miles) – 5
- ME Zones D-G (6-12 miles) – 10
- ME Zones A-E (12+ miles) – 15
- ME Zones F-G (12+ miles) – 15 (Mar 1 – Oct 31), 20 (Nov 1 – Feb 28/29)

- LMA 1 (3-12 miles) – 10
- LMA 1 (12+ miles) – 20
- Outer Cape (3-12 miles) – 10
- Outer Cape (12+ miles) – 20
- LMA 2 (3-12 miles) – 10
- LMA 2 (12 + miles) – 15

Southern Nearshore Trap/Pot Waters

Northeast – Year-round

Mid-Atlantic - September 1 – May 31

Southeast - December 1 – March 30 South of the Southeast Restricted Area North and September 1 – May 31 North of the Southeast Restricted Area North

- Universal requirements
- Gear marking – ORANGE
- Weak links ≤ 600 lbs breaking strength
- Sinking groundline

Trap Restrictions
LMA 4,5,6 – no minimum

Offshore Trap/Pot Waters

Northeast – Year-round

Southeast – September 1 – May 31 North of 32° N. lat, November 15 – April 15 Between 32° N. lat and 29° N. lat, and December 1 – March 31 Between 29°N. lat and 27° 51' N. lat

- Universal requirements
- Gear marking – BLACK or BLACK & PURPLE if overlapping Jordan Basin Gear Marking Area
- Weak links ≤ 1500 lbs in offshore, 2,000 lbs if red crab trap/pot
- Sinking groundline

Trap Restrictions
- ME Zones A-E (12+ miles) – 15
- ME Zones F-G (12+ miles) – 15 (Mar 1 – Oct 31), 20 (Nov 1 – Feb 28/29) LMA 2/3 Overlap (12+ miles) - 20
- LMA 3 (12+ miles) North of 40° – 20
- No trap restrictions in offshore waters south of 40 degrees

Southeast Restricted Area North

Nov. 15 – April 15

All of Southeast Restricted Area North
- Universal requirements
- Buoy lines must be made out of sinking line
- Buoy lines – Only single traps are allowed. Also, whole buoy line (from trap/pot to buoy) must be the same diameter and free of objects (e.g., weights, floats, etc.) and the buoy line must be made of sinking line.

Florida State Waters
- Weak links – ≤ 200lbs
- Vertical line breaking strength ≤ 1,500 lbs
- Gear marking – BLUE & ORANGE

SC/GA State Waters
- Weak links – ≤ 600lbs
- Vertical line breaking strength ≤ 2,200 lbs
- Gear marking - BLUE & ORANGE

Federal Waters
- Weak links – ≤ 600lbs
- Vertical line breaking strength ≤ 2,200 lbs
- Gear marking – GREEN & ORANGE
- Trap/pot gear must be brought back to shore at the conclusion of each trip.

Jordan Basin Gear Marking Area

Year-round
- Gear marking – RED & PURPLE if overlapping LMA1, BLACK & PURPLE if overlapping Offshore Trap/Pot Waters

Jeffreys Ledge Gear Marking Area

Year-round
- Gear marking – RED & GREEN

2.1.2 Gillnet Gear Modification Requirements and Restrictions under the ALWTRP

Gillnet Universal Requirements

- No buoy line floating at the surface.
- No wet storage of gear (all gear must be hauled out of the water at least once every 30 days)
- Fishermen are encouraged, but not required, to maintain knot-free buoy lines.
- All groundlines must be made of sinking line.

Gillnet Gear Marking Requirements

- Gillnet surface buoys to be marked to identify the vessel or fishery with one of the following: the owner's motorboat registration number and/or U.S. vessel documentation number; the federal commercial fishing permit number; or whatever positive identification marking is required by the vessel's home-port state.
- When marking is not already required by state or federal regulations, the letters and numbers to mark gear must be at least 1 inch (2.5cm) in height, block letters or Arabic numbers, in a color that contrasts with the color of the buoy.
- Buoy lines are to be marked with three 12 inch (30.48 cm), colored marks: one at the top of the buoy line, one midway along the buoy line, and one at the bottom of the buoy line. Color requirements are defined for each individual management area as described in each management area description that follows.

Gillnet Weak Link Requirements

- All buoys, floatation devices and/or weights must be attached to the buoy line with a weak link having a certain breaking strength as defined for each management area in the following tables.
- Individual weak links are not required in locations where rope of appropriate breaking strength is used. Additionally, if no up and down line is present, then weak links are not required at that location.
- Gillnet panel weak links must be chosen from the list of NMFS approved gear, which includes: off the shelf weak links, rope of appropriate breaking strength, hog rings, and other materials or devices approved in writing.
- The weak link placement must meet one of the two configuration options shown on the following page. The same configuration will be required for all gillnet panels in a string. Anchored Gillnet Anchoring Requirements
- All gillnets, regardless of number of net panels, will be required to be anchored with the holding power of at least a 22-lb Danforth-style anchor at each end of the net string (must be a burying anchor; no dead weights)

Drift Gillnet Night Fishing & Storage Restrictions

- Fishing with drift gillnet gear at night (i.e., anytime between one-half hour before sunset

and one half hour after sunrise) is prohibited unless the gear is tended (i.e., attached to the vessel).
- All drift gillnet gear must be removed from the water and stowed on board before a vessel returns to port.

Cape Cod Bay Restricted Area

Jan. 1 – May 15 **All Gear**
- CLOSED to ALL gillnet fishing

May 16 – Dec 31 **Anchored**
- Universal requirements
- Weak links – breaking strength of no greater than 1,100 lb.
- Anchoring requirements
- Sinking groundlines
- Gear marking – GREEN

Drift
- Gear marking – GREEN
- Night fishing & storage restrictions

Stellwagen Bank/ Jeffrey's Ledge Restricted Area

Year-round **Anchored**
- Universal requirements
- Weak links – breaking strength of no greater than 1,100 lb.
- Anchoring requirements
- Sinking groundlines
- Gear marking – GREEN

Drift
- Gear marking – GREEN
- Night fishing & storage restrictions

Great South Channel Restricted Gillnet Area

April 1 – June 30
All Gear (not including Silver Area)
- CLOSED to ALL gillnet fishing. Does not include Sliver Area.

July 1 – March 31
Anchored (including Silver Area)
- Universal requirements
- Weak links – breaking strength of no greater than 1,100 lb.
- Anchoring requirements
- Sinking groundlines

- Gear marking – GREEN

Drift (including Silver Area)
- Gear marking – GREEN
- Night fishing & storage restrictions

Jeffrey's Ledge Gear Marking Area

<u>Year-round</u> All Gear
- Gear marking – GREEN & BLACK

Jordan Basin Gear Marking Area
<u>Year-round</u> All Gear
- Gear marking – GREEN & YELLOW

Other Northeast Gillnet Waters

North – <u>Year-round</u>

Mid-Atlantic – <u>Sept 1 – May 31</u> Anchored
- Universal requirements
- Weak links – breaking strength of no greater than 1,100 lb.
- Anchoring requirements
- Sinking groundlines
- Gear marking – GREEN

Drift
- Gear marking – GREEN
- Night fishing & storage restrictions

Mid/South Atlantic Gillnet Waters

<u>Sept 1 – May 31</u>

Anchored
- Universal Requirements
- Sinking GroundlinesGear Marking – BLUE
- Weak Link & Anchoring Requirements- Breaking strength of no greater than 1,100 lb. Configurations differ for gillnets returning to port and those that do not. See page 9 for more details.
- Gillnets set within 300 yards (900ft) of the shoreline in NC, that do not return to port with the vessel, will also have an optional gillnet configuration: net panels configured with 5 or more weak links per net panel, depending on panel length, with a breaking strength no greater than 600 lb, and be anchored with the holding power of at least an 8-lb Danforth-style anchor on the offshore end of the string and a 31-lb dead weight on the inshore end of the string. The entire string must be set within 300 yards (900ft) of the shoreline.

Anchored
- Gear marking – GREEN
- Night fishing & storage restrictions

<u>November 15 – April 15</u> All Gear
- Fishing with or possessing gillnets is prohibited.
- Vessels transiting through the area may possess gillnet if the following three conditions are met:
  - Nets are covered with canvas or other similar material and lashed or
  - otherwise securely fastened to the deck, rail, or drum;
  - All buoys, high flyers, and anchors are disconnected from all gillnets; and
  - No fish are onboard.

Southeast U.S. Restricted Area South

<u>December 1 – March 31</u> All Gear
- The Southeast U.S. Restricted Area South is CLOSED to fishing with or possessing gillnets.

Fishing for sharks with gillnets is exempt from the closure from IF:
- Gillnet is 5 inches or greater stretched mesh;
- Gillnet is deployed so that it encloses an area of water;
- A valid commercial directed shark limited access permit is issued to the vessel and is on board;
- No net is set at night (any time between one 1/2 hour before sunset and one 1/2 hour after sunrise) or when visibility is less than 500 yards;
- The gillnet is removed from the water before night or immediately if visibility decreases below 500 yards;
- Each set is made under the observation of a spotter plane;
- No gillnet is set within 3 nm of a right, humpback, or fin whale; and
- The gillnet is removed immediately from the water if a right, humpback, or fin whale moves within 3 nm of the set gear.
- Vessel operator calls the Southeast Fisheries Science Center Panama City Laboratory (phone 850-234-6541) at least 48 hours prior to departure on fishing trips in order to arrange for observer coverage. If Panama City Laboratory requests an observer be taken, gillnetting is not allowed unless an observer is on board the vessel during the fishing trip.
- Gear marking – GREEN and BLUE

<u>Fishing with gillnet for Spanish mackerel is exempt from the closure from December 1 through December 31 and from March 1 through March 31 IF:</u>

- Gillnet mesh size is between 3-½ inches and 4-7/8 inches stretched mesh;
- A valid commercial vessel permit for Spanish mackerel is issued to the vessel and is onboard;
- No person may fish with, set, place in the water, or have on board a vessel a gillnet with a float line longer than 800 yards;

- The gillnet is removed from the water before night or immediately if visibility decreases below 500 yards;
- No net is set within 3 nm of a right, humpback, or fin whale; and
- The gillnet is removed immediately from the water if a right, humpback, or fin whale moves within 3 nm of the set gear.
- No person may fish with, set, or place in the water more than one gillnet at any time;
- No more than two gillnets, including any net in use, may be possessed at any one time; provided, however, that if two gillnets, including any net in use, are possessed at any one time, they must have stretched mesh sizes (as allowed under the regulations) that differ by at least ¼";
- No net is soaked for more than 1 hour. The soak period begins when the first mesh is placed in the water and ends either when the first mesh is retrieved back on board the vessel or the gathering of the gillnet is begun to facilitate retrieval on board the vessel, whichever occurs first; providing that, once the first mesh is retrieved or the gathering is begun, the retrieval is continuous until the gillnet is completely removed from the water;
- No net is set at night or when visibility is less than 500 yards;
- Gear marking – YELLOW

Other Southeast Gillnet Waters

<u>November 15 – April 15</u> – North of 29°00'N lat. & <u>December 1 – March 31</u> – South of 29°00'N lat.

Non-shark gillnet
- Universal requirements
- Gear marking – YELLOW
- Weak links ≤1,100 lbs
- Sinking groundline

Shark gillnet with webbing 5" or greater stretched mesh
- Gear marking – GREEN and BLUE
- Nets cannot be set within 3nm of a right, humpback, or fin whale
- Gear is immediately removed from the water if a right, humpback, or fin whale approaches within 3 nm of the set gear

<u>December 1 – March 31</u> - South of 27°51'N lat. Non-shark gillnet
Gear marking –YELLOW

Southeast U.S. Monitoring Area

<u>December 1 – March 31</u>
Shark gillnet with webbing 5" or greater stretched mesh
- Gear Marking – GREEN and BLUE
- Fishing vessel must be compliant with VMS requirements found in 50 CFR 635.69.
- Fishing vessel must carry an observer if selected by NMFS.

Appendix 2.2 Large Whale Entanglement and Vessel Strike Cases between 2010 and 2019

Large whale incidents in the North Atlantic that occurred as a result of entanglement (EN) or vessel strike (VS) by country of origin or gear type (PT: trap/pot, GN: gillnet, NE: netting, or UN: unknown). Includes the country of origin (US, CN: Canada, or UN: unkown), if determined, and fate (M: mortality, SI: serious injury, SIA: serious injury averted, or PR: prorated). Data from 2019 are still in press.

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
3/18/10	Fin		South Delaware Bay Beach	VS	MT	US	
7/17/10	Fin		Montauk, Long Island, NY	VS	NS	XU	
9/3/10	Fin		Cape Henlopen State Park, DE	VS	MT	US	
1/1/11	Fin		85 nm SE of Portland, ME	EN	MT	XU	UN
6/5/11	Fin		7 mi E of Long Branch, NJ	VS	MT	US	
7/2/11	Fin	F100	Between Anticosti Island and the North Shore, Gulf of St. Lawrence	EN	SI	CN	PT
7/9/11	Fin	1028	18.2 nm SE of Portsmouth, NH	EN	NS	XU	UN
7/24/11	Fin		Petit Etang beach, Cheticamp, NS	EN	MT	CN	UN
9/21/11	Fin		113 miles due E of Atlantic City, NJ	EN	MT	US	UN
1/23/12	Fin		Ocean City, NJ	VS	MT	US	
2/19/12	Fin		Norfolk, VA	VS	MT	US	
7/16/12	Fin		16.5 nm SE of Portland, ME	EN	PR	XU	UN
7/30/12	Fin	BOS 0631	16.5 nm ESE of Portsmouth, NH	EN	NS	XU	UN
8/10/12	Fin		Hampton Bays, NY	VS	MT	US	
10/7/12	Fin		Outer Boston Harbor Islands, MA	VS	MT	US	
1/13/13	Fin		East Hampton, NY	VS	MT	US	
6/6/13	Fin	Capitaine Crochet	St. Lawrence Marine Park, QB	EN	SI	CN	PT
4/12/14	Fin		Port Elizabeth, NJ	VS	MT	US	
5/13/14	Fin		10 nm off Rocky Harbour, NL	EN	MT	CN	PT
6/23/14	Fin		30 nm SE of Chatham, MA	EN	PR	XU	UN
8/20/14	Fin		30 nm E of Provincetown, MA	EN	PR	XU	UN
10/5/14	Fin		35 nm E of Manasquan, NJ	VS	MT	US	

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
6/6/15	Fin		41.8 nm SSE of Bar Harbor, ME	EN	SI	XU	UN
9/16/15	Fin		49.9 nm E of Corolla, NC	VS	NS	XU	
6/18/16	Fin	CCS_1308	2.3 nm NE of Truro, MA	EN	NS	US	PT
7/6/16	Fin		32.5 nm E of Truro, MA	EN	PR	XU	UN
7/8/16	Fin		60 nm NE of Virginia Beach, VA	EN	PR	XU	H/MF
7/27/16	Fin		17 nm N of Race Point, Provincetown, MA	EN	NS	US	PT
12/14/16	Fin		1.4 nm S of Provincetown, MA	EN	PR	XU	UN
5/30/17	Fin		Port Newark, NJ	VS	MT	US	
7/7/17	Fin	CCS0919	22 nm N of Provincetown, MA	EN	NS	XU	UN
8/25/17	Fin		38nm NE of Miscou Island, QC	EN	MT	CN	PT
6/22/18	Fin		16.5 nm E of Gaspe, QC	EN	MT	CN	UN
10/14/18	Fin	Ladders	3.5 nm S of Wood End, Provincetown, MA	VS	MT	US	
6/19/19	Fin		20nm E of Miscou Island, QC	EN	MT	CN	UN
7/18/19	Fin		Portugal Cove South, Avalon, NL	EN	MT	CN	PT
8/14/19	Fin		S of Bliss Island, NB	VS	NS	XC	
3/7/10	Humpback		16.2 nm E of Ponte Vedra Beach, FL	EN	SI	XU	UN
3/13/10	Humpback		Ocean City Inlet, MD	VS	MT	US	
5/5/10	Humpback		1.5 nm W of Northampton, VA	EN	SI	XU	UN
5/8/10	Humpback		0.35 nm SW of Point Judith, RI	EN	MT	US	GN
5/15/10	Humpback		Hatteras Inlet Sandbar, NC	EN	MT	XU	UN
5/18/10	Humpback	Pinch	10.7 nm NE of Truro, MA	EN	NS	XU	NE
5/28/10	Humpback		off South Beach, Martha's Vineyard, MA	EN	MT	XU	NE
6/10/10	Humpback		Jones Beach State Park, NY	VS	MT	US	
6/19/10	Humpback		3.5 nm E of Orleans, MA	EN	SIA	US	PT
7/4/10	Humpback		12 mi S of Ocean City Inlet, MD	VS	MT	US	
7/5/10	Humpback	Swallowtail	2.1 nm E of Orleans, MA	EN	NS	XU	UN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
7/23/10	Humpback	Vault	7.7 nm E of Eastham, MA	EN	NS	US	UN
7/26/10	Humpback		12.8 nm E of Chatham, MA	EN	PR	XU	UN
7/27/10	Humpback	Sodapop	16.8 nm NNW of Race Point, Provincetown, MA	EN	SIA	XU	UN
7/27/10	Humpback	Bearclaw	6.5 nm NE of Chatham, MA	EN	NS	XU	UN
8/6/10	Humpback	Aphid	S Stellwagen	VS	NS	US	
8/13/10	Humpback		2.7 nm E of Orleans, MA	EN	SI	US	PT
8/20/10	Humpback	Chili	10.3 nm NE of Race Point, Provincetown, MA	EN	SI	XU	UN
8/31/10	Humpback	Bearclaw	6.2 nm E of Chatham, MA	EN	SIA	US	PT
9/10/10	Humpback		4 miles from White Head Island, Grand Manan, NB	EN	PR	XC	UN
10/2/10	Humpback		4.0 nm NE of Race Point, Provincetown, MA	EN	PR	XU	UN
11/27/10	Humpback		0.9 nm ENE of Grand Manan Island, NB	EN	MT	XC	UN
12/23/10	Humpback		S of Port Everglades Inlet, FL	EN	SI	XU	UN
1/7/11	Humpback		6.8 nm SE of Oregon Inlet, NC	EN	SI	US	GN
2/1/11	Humpback	EKG	20.8 nm S of Bar Harbor, ME	EN	SI	US	UN
3/7/11	Humpback		Thorofare Bay, Core Sound, NC	VS	MT	US	
4/11/11	Humpback		Off Halibut Point, Rockport, MA	EN	PR	XU	UN
4/15/11	Humpback		0.4 nm NE of Little Island Park Pier, VA	EN	NS	US	GN
5/5/11	Humpback		Little Compton, RI	VS	MT	US	
5/27/11	Humpback		Island Beach State Park, NJ	VS	MT	US	
5/30/11	Humpback		0.1 nm E of Nauset Beach, Orleans MA	EN	PR	XU	UN
6/3/11	Humpback	Flyball	18.4 nm SE of Portsmouth, NH	EN	SIA	US	UN
7/2/11	Humpback		Off Race Point, Cape Cod	EN	SI	XU	UN
7/2/11	Humpback		Off Race Point, Cape Cod	VS	NS	XU	
7/5/11	Humpback	Chalkline	Jeffreys Ledge	VS	NS	US	
7/9/11	Humpback		3.4 nm SSE of Monomoy Island, MA	EN	PR	XU	UN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
7/10/11	Humpback		6.1 nm E of Monomoy Island, MA	EN	PR	XU	UN
7/18/11	Humpback	Reflection	1.9 nm N of North Truro, MA	EN	SIA	US	PT
7/21/11	Humpback		3.0 nm SE of Oregon Inlet, Rodanthe, NC	EN	PR	XU	UN
7/25/11	Humpback	Ganesh	8.8 nm N of Race Point, Provincetown, MA	EN	NS	US	UN
7/30/11	Humpback	Reflection	8.3 nm N of Race Point, Provincetown, MA	EN	NS	US	MF
7/30/11	Humpback	2009 Calf of Rapier	8.0 nm NNE of Race Point, Provincetown, MA	EN	NS	US	MF
7/31/11	Humpback	2011 Calf of Canopy	6.4 nm N of Race Point, Provincetown, MA	EN	NS	US	MF
8/2/11	Humpback	Artillery	7.0 nm NNE of Race Point, Provincetown, MA	EN	NS	US	MF
8/4/11	Humpback	2011 Calf of Ganesh	Stellwagen	VS	NS	US	
8/14/11	Humpback	Echo	6.8 nm NE of Race Point, Provincetown, MA	EN	NS	US	MF
8/24/11	Humpback	Piano	5 nm E of Chatham, MA	VS	NS	US	
9/15/11	Humpback	Checkmark	9.0 nm NE of Plymouth, MA	EN	NS	US	UN
9/30/11	Humpback	Hippocampus	5.8 nm ENE of Chatham, MA	EN	SIA	US	GN
10/10/11	Humpback	Clutter	Bay of Fundy, 5.3 nm NE of Grand Manan Island, NB	EN	SI	XC	UN
11/8/11	Humpback	Dyad	34.2 nm E of Nantucket, MA	EN	NS	XU	MF
11/13/11	Humpback		Bay of Fundy, 10.3 nm E of Lubec, ME	EN	SIA	CN	PT
1/26/12	Humpback	7621	2.0 nm NE of Virginia Beach, VA	EN	NS	XU	H/MF
3/11/12	Humpback		2.8 nm SE of Hatteras, NC	EN	SIA	US	GN
4/7/12	Humpback		10.1 nm SE of Southwest Harbor, ME	EN	SIA	US	PT
4/13/12	Humpback		18.7 nm SE of Southwest Harbor, ME	EN	SIA	US	PT
4/29/12	Humpback		10 nm ESE of Chatham, MA	EN	SI	US	UN
5/18/12	Humpback	Basmati	6.4 nm NW of Race Point, Provincetown, MA	EN	NS	US	PT
6/9/12	Humpback	Etchasketch	6.2 nm NW of Race	EN	NS	US	MF

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
			Point, Provincetown, MA				
6/10/12	Humpback	Apex	14.8 nm ESE of Chatham, MA	EN	NS	US	MF
6/18/12	Humpback	Sabot	7.2 nm NW of Race Point, Provincetown, MA	EN	NS	US	GN
6/22/12	Humpback	Dome	8.5 nm E of Chatham, MA	EN	NS	US	MF
7/5/12	Humpback	Hiatus	5.0 nm NE of Chatham, MA	EN	SIA	US	PT
7/6/12	Humpback	Serengeti	5.0 nm NE of Chatham, MA	EN	SIA	US	PT
7/8/12	Humpback	Piano	6.2 nm N of Chatham, MA	EN	NS	XU	UN
7/29/12	Humpback		15.2 nm SE of Gloucester, MA	EN	SI	XU	UN
8/4/12	Humpback	Aphid	7.7 nm NE of Race Point, Provincetown, MA	EN	SI	XU	UN
8/16/12	Humpback	Doric	10 nm SE of Gloucester, MA	EN	NS	XU	MF
8/18/12	Humpback	Hiatus	4.7 nm NE of Chatham, MA	EN	SIA	US	PT
8/21/12	Humpback	2011 Calf Of Wizard	3.6 nm NE of Race Point, Provincetown, MA	EN	PR	XU	MF
8/24/12	Humpback	Forceps	6.0 nm NW of Race Point, Provincetown, MA	EN	SI	US	UN
8/27/12	Humpback	Cardhu	8.6 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
9/3/12	Humpback	Reflection	2.6 nm NE of Race Point, Provincetown, MA	EN	NS	US	MF
9/16/12	Humpback		20.1 nm NE of Gloucester, MA	EN	SIA	US	GN
9/17/12	Humpback	Goalpost	2.2 nm NE of Race Point, Provincetown, MA	EN	SIA	US	PT
9/23/12	Humpback	Zelle	12.5 nm SE of Portsmouth, NH	EN	NS	US	MF
9/23/12	Humpback	2009 Calf Of Thumper	12.9 nm SE of Portsmouth, NH	EN	NS	US	MF
10/23/12	Humpback	2012 Calf Of Tornado	12.0 nm NE of Gloucester, MA	EN	SIA	US	PT
11/27/12	Humpback		11.8 nm NE of Plymouth, MA	EN	SIA	US	PT
1/6/13	Humpback		6.4 nm NNE of Virginia Beach, VA	EN	NS	XU	UN
4/3/13	Humpback		9 mi off Ft. Story, VA	VS	MT	US	

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
5/17/13	Humpback	2013 Calf of Buckshot	Stellwagen Bank	VS	NS	XU	
6/5/13	Humpback	Thumper	11.0 nm SE of Chatham, MA	EN	NS	US	MF
6/20/13	Humpback	Thicket	13.0 nm ESE of Chatham, MA	EN	NS	US	H/MF
7/7/13	Humpback	2013 Calf of Spar	Bar Harbor, ME	VS	NS	XU	
9/11/13	Humpback		Poquoson River, VA	VS	NS	US	
9/13/13	Humpback		mouth of York River, VA	VS	MT	US	
9/16/13	Humpback		29.4 nm SE of Chatham, MA	EN	PR	XU	UN
9/28/13	Humpback		0.2 nm SE of Saltaire, NY	EN	MT	XU	GN
9/29/13	Humpback	Foggy	1.5 nm NW of Tibert's Landing, NS	EN	SIA	CN	PT
10/1/13	Humpback		Buzzards Bay, MA	EN	MT	US	UN
10/4/13	Humpback		2.0 nm E of Chatham, MA	EN	SI	XU	UN
11/14/13	Humpback		2.7 nm NE of Manasquan, NJ	EN	SIA	US	GN
6/2/14	Humpback		14 nm SE of Chatham, MA	EN	PR	XU	UN
6/9/14	Humpback	Hangglide	35 nm WSE of Brier Island, NS	EN	SIA	CN	PT
6/21/14	Humpback		6 nm E of Gloucester, MA	EN	PR	XU	UN
7/16/14	Humpback	2014CalfOfCanopy	Stellwagen Bank	VS	NS	XU	
7/16/14	Humpback	Northstar	Stellwagen Bank	VS	NS	US	
7/18/14	Humpback		Provincetown Harbor, MA	EN	SI	XU	UN
7/30/14	Humpback		Cape May, NJ	VS	NS	US	
8/11/14	Humpback	Monarch	Great South Channel	EN	NS	XU	UN
8/14/14	Humpback		600ft off Harvey Cedars, Long Island Beach, NJ	VS	PR	XU	
9/3/14	Humpback		600ft off Harvey Cedars, Long Island Beach, NJ	EN	PR	XU	NE
9/11/14	Humpback	Spinnaker	18 nm SE of Southwest Harbor, ME	EN	MT	XU	GN,PT
9/20/14	Humpback	NYC0010	off Rockaway Beach, Long Island, NY	EN	PR	XU	GN
10/1/14	Humpback		12 nm E of Metompkin Inlet, VA	EN	PR	XU	UN
10/15/14	Humpback	Buckshot	Stellwagen Bank	VS	NS	XU	
12/15/14	Humpback		8.5 nm S of Grand Manan, NB	EN	PR	CN	PT
12/25/14	Humpback	Triomphe	Little Cranberry Island, ME	EN	MT	XU	UN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
2/1/15	Humpback		9.3 nm SW of Cape Lookout, NC	EN	SI	XU	NE
2/3/15	Humpback		Corolla, NC	EN	MT	US	UN
4/13/15	Humpback		15.4 nm SE of Fire Island, NY	VS	MT	US	
4/18/15	Humpback		Smith Point, NY	VS	MT	US	
4/26/15	Humpback	Not named	1.1 nm N of Race Point, Provincetown, MA	EN	SIA	XU	UN
5/14/15	Humpback	Spinnaker	77.2 nm E of Portsmouth, NH	EN	SIA	US	PT
6/20/15	Humpback	Not named	27.6 nm SE of Chatham, MA	EN	SIA	XU	UN
6/29/15	Humpback		Fire Island, NY	VS	MT	US	
7/9/15	Humpback		3.4 nm SE of Sandy Hook, NJ	EN	PR	XU	UN
7/9/15	Humpback	Lacuna	4.4 nm N of Brier Island, NS	EN	NS	XC	UN
7/11/15	Humpback	Not named	7.2 nm N of Race Point, Provincetown, MA	EN	SIA	US	PT
7/25/15	Humpback	Putter	2.7 nm NE of North Truro, MA	EN	NS	US	MF
8/2/15	Humpback	Not named	3.5 nm SE of Race Point, Provincetown, MA	EN	SI	XU	GN,PT
8/2/15	Humpback		4.8 nm NE of Chatham, MA	EN	NS	XU	MF
8/2/15	Humpback		14.8 nm NNE of Chatham, MA	EN	PR	XU	UN
8/14/15	Humpback		1.7 nm N of Race Point, Provincetown, MA	EN	NS	US	PT
8/15/15	Humpback	Mogul	Jeffreys Ledge	VS	NS	US	
8/16/15	Humpback	Cardhu	6.7 nm NE of Race Point, Provincetown, MA	EN	NS	XU	H/MF
8/29/15	Humpback	Crinkle	8.5 nm E of Chatham, MA	EN	SIA	US	PT
9/1/15	Humpback	2015CalfOfOwl	6.0 nm NE of Race Point, Provincetown, MA	EN	NS	XU	MF
9/7/15	Humpback		12.2 nm NW of Race Point, Provincetown, MA	EN	PR	XU	MF
9/17/15	Humpback	Epee	10.5 nm NNE of Race Point, Provincetown, MA	VS	NS	US	
9/18/15	Humpback	Azrael	9.4 nm NE of Race Point, Provincetown, MA	EN	NS	US	H/MF

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
9/18/15	Humpback	Diablo	6.5 nm NE of Race Point, Provincetown, MA	EN	NS	XU	MF
9/19/15	Humpback	Mogul	13.0 nm ESE of Hampton, NH	EN	NS	US	H/MF
9/24/15	Humpback		13.5 nm ESE of Hampton, NH	EN	PR	US	AN
9/25/15	Humpback		0.6 nm N of Menemsha Harbor, MA	EN	SI	XU	UN
10/17/15	Humpback		Lloyd Neck Harbor, NY	VS	MT	US	
11/18/15	Humpback	Lunar	7.7 nm N of Race Point, Provincetown, MA	EN	NS	XU	MF
12/4/15	Humpback		8.8 nm SW of Race Point, Provincetown, MA	EN	SIA	US	UN
12/4/15	Humpback		16.5 nm NW of Brier Island, NS	EN	PR	CN	PT
12/13/15	Humpback		1.9 nm E of Fort Story, VA	VS	NS	US	
12/15/15	Humpback		3.5 nm SE of Ingomar, NS	EN	PR	CN	PT
1/7/16	Humpback		1 nm S of Great Captains Island, Greenwich, CT	EN	PR	US	PT
1/9/16	Humpback	MAHWC254/HDR VA053	2.6 nm NE of Fort Story, VA	VS	SI	US	
1/11/16	Humpback	No ID	1.2 nm SE of Hatteras, NC	EN	SIA	US	GN
1/14/16	Humpback		1.0 nm NE of Fort Story, VA	EN	SIA	US	GN
1/16/16	Humpback	MAHWC250	2.3 nm NE of Fort Story, VA	VS	NS	US	
3/3/16	Humpback	MAHWC251/HDR VA045	off Virginia Beach, VA	VS	SI	US	
4/21/16	Humpback		Shackleford Banks, NC	EN	NS	XU	UN
4/24/16	Humpback	No ID	1 nm SE of Race Point, Provincetown, MA	EN	PR	XU	UN
4/25/16	Humpback	No ID	Marshfield, MA	VS	MT	US	
4/25/16	Humpback		Napeague Bay, NY	VS	MT	XU	
5/14/16	Humpback	GOM1609	0.5 nm SW of Wood End, Provincetown, MA	EN	SIA	US	PT
5/18/16	Humpback	Foggy	7.6 nm NE of Gloucester, MA	EN	SI	XU	UN
5/21/16	Humpback		0.4 nm E of Mantoloking, NJ	EN	PR	XU	GN
5/26/16	Humpback	GOM1552	1.5 nm SE of Race	EN	SIA	US	PT

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
			Point, Provincetown, MA				
6/15/16	Humpback	No ID	20.9 nm E of Fenwick Island, DE	VS	MT	US	
6/16/16	Humpback	Freckles	3.4 nm E of Wellfleet, MA	EN	NS	XU	UN
6/24/16	Humpback	No ID	0.5 nm off Shinnecock Inlet, NY	VS	MT	US	
6/25/16	Humpback	GOM1689	0.4 nm E of Monomoy, MA	VS	NS	US	
6/26/16	Humpback	Snowplow	15 nm NE of Rockport, MA	VS	MT	US	
7/2/16	Humpback	2016CalfOfTwine	9.9 nm N of Race Point, Provincetown, MA	EN	NS	US	H/MF
7/5/16	Humpback	No ID	2.4 nm SE of Chatham, MA	EN	SI	XU	UN
7/26/16	Humpback	Scratch	9.9 nm NE of Race Point, Provincetown, MA	EN	NS	XU	UN
8/8/16	Humpback	No ID	5.0 nm NE of Race Point, Provincetown, MA	EN	SIA	US	PT
8/14/16	Humpback	Storm	10.1 nm N of Race Point, Provincetown, MA	EN	NS	US	PT
8/15/16	Humpback	Victim	21.5 nm SSW of Grand Manan Island, NB	EN	SIA	CN	PT
8/16/16	Humpback	A+	30.0 nm E of Nantucket Island, MA	EN	NS	US	MF
9/2/16	Humpback		14.9 nm SE of Gloucester, MA	EN	PR	XU	UN
9/9/16	Humpback	GOM1602	off Race Point, Provincetown, MA	VS	NS	US	
9/10/16	Humpback		Jobs Neck Cove, Martha's Vineyard, MA	EN	MT	XU	UN
9/15/16	Humpback	Echo	5.9 nm N of Race Point, Provincetown, MA	EN	NS	US	PT
9/16/16	Humpback	No ID	3.6 nm NE of Chatham, MA	EN	SIA	US	PT
9/16/16	Humpback	Tear	6.6 nm N of Race Point, Provincetown, MA	EN	NS	US	MF
9/17/16	Humpback	Crisscross	9.1 nm NE of Race Point, Provincetown, MA	EN	NS	XU	MF
10/8/16	Humpback	Aswan	9.5 nm N of Race Point, Provincetown, MA	EN	NS	XU	MF

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
10/16/16	Humpback	GOM1626	2.1 nm E of Ipswich, MA	EN	MT	US	PT
10/19/16	Humpback	Storm	0.5 nm N of Provincetown, MA	EN	NS	US	PT
10/25/16	Humpback	SEUS1606	3.9 nm SW of Beaufort, NC	EN	NS	US	GN
11/13/16	Humpback	NYC#0052	off Belmar, NJ	EN	PR	XU	MF
11/14/16	Humpback		4.7 nm E of Stone Harbor, NJ	EN	PR	US	PT
12/4/16	Humpback		1.1 nm S of Quogue, NY	EN	PR	XU	UN
12/8/16	Humpback	GOM1636	3.8 nm NE of Hull, MA	EN	SIA	US	PT
12/16/16	Humpback	HDRVA078	2-3 mi E of Dam Neck, VA	EN	MT	US	UN
12/19/16	Humpback		0.1 nm E of Tiverton, NS, Canada	EN	PR	XC	UN
12/20/16	Humpback	GOM1633	1.2 nm S of Race Point, Provincetown, MA	EN	NS	US	PT
1/5/17	Humpback		6.2 nm E of Virginia Beach, VA	EN	SIA	US	GN
2/2/17	Humpback		Hampton Roads Bridge Tunnel, Chesapeake Bay, VA	VS	MT	US	
2/5/17	Humpback		Chesapeake Bay Bridge Tunnel, Chesapeake Bay, VA	VS	MT	US	
2/11/17	Humpback		Fort Story, VA	VS	MT	US	
2/14/17	Humpback		off Virginia Beach, VA	VS	SI	US	
4/3/17	Humpback		Rockaway, NY	VS	MT	US	
5/4/17	Humpback		North Shores, Rehobeth Beach, DE	VS	MT	US	
6/15/17	Humpback		Jamestown, RI	VS	MT	US	
6/18/17	Humpback	GOM1625	Monomoy, Chatham, MA	EN	MT	XU	UN
7/15/17	Humpback	2016CalfOfThumper	6.3 nm NW of Race Point, Provincetown, MA	EN	PR	US	H/MF
7/18/17	Humpback	2017CalfOfFirefly	3.7 nm NE of Race Point, Provincetown, MA	EN	NS	US	H/MF
7/20/17	Humpback	Firefly	8.5 nm N of Race Point, Provincetown, MA	EN	NS	US	MF
7/26/17	Humpback	Sprinkles	8.2 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
8/1/17	Humpback	2017CalfOfCajun	21.9 nm SE of Gloucester, MA	EN	MT	XU	GN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
8/10/17	Humpback	2017CalfOfHancock	5.2 nm NNE of Race Point, Provincetown, MA	EN	NS	US	PT
8/14/17	Humpback	2014CalfOfEcho	4.7 nm NE of Race Point, Provincetown, MA	EN	NS	US	MF
8/14/17	Humpback	Perseid	4.5 nm NE of Race Point, Provincetown, MA	EN	NS	US	MF
8/18/17	Humpback	2017CalfOfHancock	Southern Stellwagen Bank	EN	NS	US	MF
8/19/17	Humpback		0.5 mi off of Smith Point State Park, Long Island, NY	EN	PR	XU	UN
8/28/17	Humpback	Drifter	10.2 nm SE of Frenchboro, ME	EN	SIA	XU	UN
9/12/17	Humpback	2016CalfOfSanchal	1.1 nm E of Truro, MA	EN	SIA	US	PT
9/18/17	Humpback		29.3 nm SE of Jonesport, ME	EN	PR	CN	PT
9/24/17	Humpback	GOM1744	7.7 nm NNW of Race Point, Provincetown, MA	EN	SIA	US	PT
10/1/17	Humpback	2017CalfOfGumdrop	7.4 nm NW of Race Point, Provincetown, MA	EN	NS	US	UN
10/1/17	Humpback		9nm S of Narragansett, RI	VS	MT	XU	
10/3/17	Humpback	GOM1747	6.4 nm NW of Race Point, Provincetown, MA	EN	NS	XU	MF
10/6/17	Humpback	2015CalfOfXylem	3.9 nm NE of Chatham, MA	EN	SIA	XU	GN
10/10/17	Humpback		3.0 nm NE of Gloucester, MA	EN	PR	US	PT
10/14/17	Humpback		6.0 nm N of Race Point, Provincetown, MA	EN	PR	XU	UN
10/21/17	Humpback	2016CalfOfEcho	9.1 nm NE of Gloucester, MA	EN	SIA	US	UN
10/21/17	Humpback	GOM1747	1.0 nm SE of Quogue, Long Island, NY	EN	PR	XU	UN
11/12/17	Humpback		1.0 nm S of Atlantic Beach, NY	EN	PR	XU	MF
11/30/17	Humpback		17nm S of Grand Manan, NS	EN	PR	CN	PT
12/26/17	Humpback		East Atlantic Beach, NY	VS	MT	US	
1/28/18	Humpback		Peters Point, FL	VS	MT	US	
2/12/18	Humpback		Breezy Point, NY	VS	MT	US	
4/22/18	Humpback	Lascaux	7.6 nm SW of Provincetown, MA	EN	NS	US	PT

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
5/5/18	Humpback		Raritan Bay, NJ	VS	MT	US	
5/18/18	Humpback		Long Beach, NY	VS	MT	US	
5/27/18	Humpback		Fire Island, NY	VS	MT	XU	
6/1/18	Humpback		Breezy Point, NY	VS	MT	XU	
6/20/18	Humpback	Sutures	3.5 nm NW of Brier Island, NS	EN	NS	XC	UN
6/21/18	Humpback	Crinkle	12.1 nm SE of Chatham, MA	EN	NS	US	MF
7/14/18	Humpback	2018CalfOfPierce	3.6 nm N of Brier Island, NS	EN	SIA	CN	UN
7/14/18	Humpback	2017CalfOfRapier	5.8 nm W of Race Point, Provincetown, MA	EN	SI	US	PT
7/14/18	Humpback		0.5 nm S of Nantucket, MA	EN	SI	XU	UN
7/20/18	Humpback	Cardhu or Orbit	5 nm N of Race Point, Provincetown, MA	EN	NS	US	MF
7/20/18	Humpback	Milkweed or Mogul	6.7 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
7/20/18	Humpback	Owl	5.7 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
7/20/18	Humpback	2016CalfOfSanchal	Stellwagen Bank	VS	NS	XU	
7/21/18	Humpback	Rhino	7.2 nm E of Hampton Beach, NH	EN	PR	US	MF
7/23/18	Humpback		High Duck Island, Grand Manan, NB	EN	NS	CN	WE, SE
7/26/18	Humpback		Napeague, NY	EN	MT	XU	UN
7/30/18	Humpback	NYC0097	1.0 nm SE of Montauk, NY	EN	SI	XU	UN
7/30/18	Humpback	Cardhu	8.2 nm NW of Race Point, Provincetown, MA	EN	PR	US	AN
8/1/18	Humpback	Dyad	7.8 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
8/3/18	Humpback	Sabot	0.6 nm W of Brier Island, NS	EN	NS	CN	UN
8/5/18	Humpback		10 nm E of Long Island, NY	EN	SI	XU	UN
8/6/18	Humpback	Komodo	9.2 nm NW of Race Point, Provincetown, MA	EN	NS	XU	UN
8/7/18	Humpback	Samara	6.2 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
8/9/18	Humpback	Dross	7.8 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
8/11/18	Humpback		Cape May, NJ	VS	SI	US	

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
8/15/18	Humpback		Stellwagen Bank	VS	SI	US	
8/17/18	Humpback	Samara	8.0 nm NW of Race Point, Provincetown, MA	EN	NS	US	HK
8/27/18	Humpback	Patches	6.8 nm E of Rockport, MA	EN	NS	XU	MF
8/29/18	Humpback	2016CalfOfVenom	1.5 nm E of Hampton Beach, NH	EN	MT	US	NE
9/1/18	Humpback	2016CalfOfSanchal	9.4 nm S of Chatham, MA	EN	NS	US	PT
9/2/18	Humpback		Brier Island, NS	VS	NS	CN	
9/2/18	Humpback	Lollipop	3.9 nm E of Chatham, MA	EN	NS	US	MF
9/3/18	Humpback	Shuffleboard	1.0 nm N of Rockport, MA	EN	NS	US	MF
9/7/18	Humpback	Peajack	off Brier Island, NS	EN	MT	XC	PT
9/8/18	Humpback		3.1 nm SE of Gloucester, MA	EN	PR	XU	UN
9/14/18	Humpback	Dross	6.1 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
9/21/18	Humpback		20 nm E of Rockport, MA	EN	PR	XU	UN
9/23/18	Humpback		10.5 nm SE of Gloucester, MA	EN	PR	XU	UN
9/23/18	Humpback		14.1 nm S of Martha's Vineyard, MA	EN	PR	XU	UN
9/29/18	Humpback	2016CalfOfRavine	E of Campbobello Island, NB	EN	NS	XC	UN
12/13/18	Humpback		0.7 nm E of Mayport, FL	EN	PR	XU	UN
12/15/18	Humpback	2016CalfOfZeppelin	Cape Point, Lewes, DE	VS	MT	US	
2/17/19	Humpback	2017 Calf Of Diablo	Corolla, NC	VS	MT	US	
3/13/19	Humpback	Plateau	5 nm off Virginia Beach, VA	VS	MT	US	
3/17/19	Humpback		Corolla, NC	EN	MT	XU	GN
4/23/19	Humpback		0.5 nm S of Cape May, NJ	EN	SI	XU	UN
5/1/19	Humpback		Avalon Pier, Kill Devil Hills, NC	VS	NS	XU	
5/2/19	Humpback		0.1 nm W of Ocean City, MD	EN	PR	US	GN
5/5/19	Humpback		Westhampton Beach, NY	VS	MT	US	
6/9/19	Humpback	Mostaza	11.5 nm N of Race Point, Provincetown, MA	EN	NS	US	UN
6/24/19	Humpback	Krakatoa	11.8 nm E of Chatham, MA	EN	SI	XU	UN
7/7/19	Humpback		1 nm off Napeague, NY	VS	PR	US	

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
7/11/19	Humpback		200 ft S of Manchester, MA	EN	NS	XU	NE
7/15/19	Humpback		12 mi NE of Shinnecock Inlet, Long Island, NY	EN	NS	US	GN
7/22/19	Humpback		6.3 nm E of Kingsburg, NS	EN	PR	XC	UN
7/24/19	Humpback	2019 Calf Of Pinball	7 nm E of Gloucester, MA	EN	NS	US	MF
7/26/19	Humpback		4.5 nm E of Sea Isle City, NJ	EN	NS	US	PT
7/29/19	Humpback	Nike	16.1 nm E of Newburyport, MA	EN	NS	US	H/MF
7/31/19	Humpback	Komodo	11.4 nm SE of Montauk, NY	EN	NS	XU	HK
8/5/19	Humpback	Nile	7.4 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
8/6/19	Humpback		Ocean City, MD	EN	SI	XU	UN
8/15/19	Humpback	2015 Calf Of Jabiru	1.4 nm E of Chatham, MA	EN	SIA	US	PT
8/26/19	Humpback	Zorro	Provincetown Harbor, MA	EN	PR	US	UN
9/3/19	Humpback	NYC0159	1.4 nm W of North Truro, MA	EN	NS	XU	UN
9/3/19	Humpback	NYC0159	1.4 nm W of North Truro, MA	VS	NS	XU	
9/3/19	Humpback		13.6 nm SW of Nantucket, MA	EN	NS	XU	UN
9/10/19	Humpback	Nuke	20.3 nm SE of Gloucester, MA	EN	SIA	US	AN
9/10/19	Humpback	Doric	8.3 nm NW of Race Point, Provincetown, MA	EN	NS	US	MF
10/4/19	Humpback		2.2 nm W of North Truro, MA	EN	SIA	US	PT
10/7/19	Humpback	Diablo	20.5 nm SE of Gloucester, MA	EN	NS	XU	MF
10/24/19	Humpback	2017 Calf Of Manhattan	Barnegat Light, NJ	VS	MT	US	
10/24/19	Humpback		14.4 nm SE of Ocean City, MD	EN	PR	US	GN
12/2/19	Humpback	Kansas	6.2 nm N of Brier Island, NS	EN	SIA	CN	PT
12/13/19	Humpback	NYC0144	21 nm SE of Newport, RI	VS	MT	US	
6/16/10	Minke		Goose River, PEI	EN	MT	CN	UN
7/2/10	Minke		Naufrage, PEI	EN	MT	CN	UN
7/9/10	Minke		Fire Island Inlet, Fire Island, NY	VS	MT	US	
8/14/10	Minke		2.6 nm ESE of Schoodic Island, ME	EN	SIA	US	PT

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
8/19/10	Minke		1.7 nm NE of Ragged Island, ME	EN	SIA	US	PT
8/21/10	Minke		3.5 nm ENE of Plymouth Harbor, MA	EN	SI	XU	UN
10/31/10	Minke		La Poile Bay, NL	EN	SIA	CN	SE
5/6/11	Minke		1.7 nm NW of Gay Head, Martha's Vineyard, MA	EN	MT	US	PT
6/3/11	Minke		off Tadoussac, QC	EN	SI	CN	UN
7/6/11	Minke		Ochre Pit Cove, Conception Bay, NL	EN	SIA	CN	GN
7/17/11	Minke		2.4 nm E of Nahant, MA	EN	PR	XU	UN
7/24/11	Minke		1.9 nm NNE of North Truro, MA	EN	PR	XU	UN
8/4/11	Minke		Sandy Hook Bay, NJ	VS	MT	US	
8/26/11	Minke		Sandy Hook GNRA, N Horseshoe Cove, NJ	EN	MT	US	NE
8/29/11	Minke		Moriches Bay, NY	VS	MT	US	
9/7/11	Minke		Greenspond, NL	EN	PR	CN	GN
9/19/11	Minke		Northumberland Strait, Pointe-Sapin, PEI	EN	PR	CN	UN
10/5/11	Minke		0.7 nm SE of Pumpkin Island, ME	EN	SIA	US	PT
10/6/11	Minke		6.9 nm NNW of Matinicus Island, ME	EN	MT	US	PT
12/7/11	Minke		Carolina Beach, NC	VS	MT	US	
12/19/11	Minke		Bay of Fundy, 3.0 nm W of Seal Cove, Grand Manan Island, NB	EN	MT	CN	PT
2/4/12	Minke		6.5 nm NNW of Virginia Beach, VA	EN	NS	XU	H/MF
3/16/12	Minke		Cranes Beach, Ipswich, MA	EN	MT	US	UN
5/15/12	Minke		Sable Island Bank	EN	SI	CN	PT
6/21/12	Minke		4.6 nm E of Frenchboro, ME	EN	SI	XU	UN
6/23/12	Minke		Container Terminal Port Newark, NJ	VS	MT	US	
6/26/12	Minke		1.5 nm N of Renews Rock, NL	EN	MT	CN	PT
6/30/12	Minke		11.5 nm W of Campbell Cove/North Lake, Naufrage, PEI	EN	MT	CN	PT
7/1/12	Minke		23.2 nm SE of Portsmouth, NH	EN	PR	XU	UN
7/1/12	Minke		East Point, Northern Lake Harbor, PEI	EN	MT	CN	PT
7/13/12	Minke		10.5 nm SW of Jonesport, ME	EN	PR	US	UN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
7/17/12	Minke		1.7 nm NNE of Chatham, MA	EN	SI	XU	UN
8/2/12	Minke		6.7 nm E of Race Point, Provincetown, MA	EN	PR	XU	UN
8/5/12	Minke		Hardings Beach, Chatham, MA	EN	MT	US	UN
8/22/12	Minke		7.8 nm SE of Portsmouth, NH	EN	SIA	US	UN
10/4/12	Minke		SW Cliff Island, ME	EN	MT	US	UN
3/31/13	Minke		Bay L'Argent, Fortune Bay, NL	EN	NS	CN	BM
7/1/13	Minke		location sensitivity 68.2 nm E of Chatham, MA	EN	MT	US	MT
7/23/13	Minke		off Newport, RI	EN	PR	XU	UN
8/17/13	Minke		9.4 nm E of Newburyport, MA	EN	SI	XU	UN
8/31/13	Minke		Miminegash, PEI	EN	MT	CN	UN
10/4/13	Minke		4.2 nm SE of Seal Harbor, ME	EN	PR	US	UN
4/7/14	Minke		8 nm SE of Marblehead, MA	EN	SIA	US	PT
6/9/14	Minke		6 nm ENE of Race Point, MA	EN	MT	US	PT
7/2/14	Minke		Northumberland Strait, NB	EN	MT	CN	UN
7/10/14	Minke		10 nm SE of Southport, ME	EN	PR	XU	UN
7/12/14	Minke		10 nm S of Southampton, NY	EN	SI	XU	DE
7/17/14	Minke		South Addison, ME	EN	MT	XU	UN
7/21/14	Minke		5 nm NW of Cheticamp, Cape Breton, NS	EN	SIA	CN	PT
7/29/14	Minke		5 nm SE of Herring Cove, NS	EN	MT	CN	PT
7/29/14	Minke		5 nm SE of Herring Cove, NS	VS	MT	CN	
12/24/14	Minke		Dam Neck, VA	VS	MT	US	
3/26/15	Minke		2.0 nm E of Cape Canaveral	EN	SI	XU	UN
4/16/15	Minke		Lockes Island, Shelburne, NS	EN	MT	CN	UN
5/9/15	Minke		Duck, NC	EN	MT	XU	NE
6/6/15	Minke		Coney Island, NY	VS	MT	US	
6/14/15	Minke		21.8 nm SE of Chatham, MA	EN	PR	XU	UN
6/23/15	Minke		4.0 nm SE of Ingonish, NS	EN	PR	CN	PT

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
7/3/15	Minke		32.6 nm SE of Point Judith, RI	EN	SIA	US	PT
7/7/15	Minke		20.5 nm NW of Funk Island, NL	EN	MT	CN	PT
7/7/15	Minke		St. Brides, Cape St. Mary's, NL	EN	NS	CN	WE
7/20/15	Minke		0.5 nm SE of Bliss Island, NB	EN	SIA	CN	UN
8/18/15	Minke		Roseville, PEI	EN	MT	CN	UN
9/1/15	Minke		Gloucester, MA	EN	MT	US	UN
9/21/15	Minke		Cape Wolfe, Burton, PEI	EN	MT	CN	UN
10/31/15	Minke		2.1 nm S of Boothbay Harbor, ME	EN	SIA	US	PT
12/6/15	Minke		13 nm S of Port Joli, NS	EN	MT	CN	PT
5/3/16	Minke		Biddeford, ME	EN	MT	US	PT
7/21/16	Minke		Digby, NS	EN	SI	XC	UN
8/9/16	Minke		4.4 nm S of Matinicus Island, ME	EN	SIA	US	PT
8/15/16	Minke		2.0 nm SE of Seguin Island, ME	EN	MT	US	UN
8/30/16	Minke		3.1 nm SW of Matinicus Island, ME	EN	MT	US	PT
11/2/16	Minke		Bonne Bay, Gros Morne National Park, NL	EN	PR	XC	UN
12/4/16	Minke		location sensitivity 10.8 nm E of Ocean City, MD	EN	MT	US	GN
4/24/17	Minke		Verrazano-Narrows Bridge, State Island, NY	VS	MT	US	
5/31/17	Minke		Stephenville, NL	EN	SIA	CN	PT
7/6/17	Minke		Manoment Point, MA	EN	MT	US	PT
7/22/17	Minke		Piscataqua River NH / ME	EN	MT	US	UN
8/3/17	Minke		6.8 nm SE of Bar Harbor, ME	EN	SIA	US	PT
8/9/17	Minke		6.2nm NE of Ellisville, MA	EN	MT	US	UN
8/11/17	Minke		3.8 nm SE of York, ME	EN	PR	US	UN
8/12/17	Minke		0.9 nm W of West Tremont, ME	EN	MT	US	UN
8/14/17	Minke		1.0nm SE of Narragansett, RI	EN	MT	US	UN
8/17/17	Minke		Rye, NH	EN	MT	US	UN
8/28/17	Minke		9.6 nm S of Harpswell, ME	EN	MT	US	PT

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
8/30/17	Minke		11.1nm NE of Tignish, PEI	EN	MT	CN	UN
9/4/17	Minke		St. Carroll's, Great Northern Peninsula, NL	EN	MT	CN	NE
9/6/17	Minke		Newport, RI	VS	MT	US	
9/17/17	Minke		Henry Island, Inverness, NS	EN	MT	CN	NE
9/26/17	Minke		12.6nm E of Richbuctou, NB	EN	PR	CN	UN
9/27/17	Minke		5.7nm NE of Richbuctou, NB	EN	MT	CN	UN
10/9/17	Minke		5.9 nm E of Portsmouth, NH	EN	SIA	US	PT
10/10/17	Minke		5.0 nm E of Rockland, ME	EN	MT	US	PT
2/9/18	Minke		Tiverton, Long Island, NS	EN	MT	XC	UN
5/25/18	Minke		Digby, NS	VS	MT	CN	
6/11/18	Minke		Cape Dauphin, NS	EN	MT	CN	PT
6/19/18	Minke		East Point, PEI	EN	MT	CN	UN
6/22/18	Minke		4.5 nm N of Grand Manan, NB	EN	PR	XC	UN
6/24/18	Minke		Wellfleet, MA	EN	MT	XU	GN
7/7/18	Minke		1.6 nm E of Newcastle, NH	EN	MT	US	PT
7/22/18	Minke		Cape Neddick, ME	EN	MT	XU	UN
7/28/18	Minke		Biddeford, ME	EN	MT	XU	UN
8/4/18	Minke		1.5 nm E of Peaks Island, ME	EN	SIA	US	PT
8/6/18	Minke		Fish Cove Point, NL	EN	PR	CN	NE
8/29/18	Minke		7.5 nm SE of Chatham, MA	EN	PR	XU	UN
8/29/18	Minke		1.0 nm W of Gloucester, MA	EN	SIA	US	UN
9/3/18	Minke		Nancy Head, Campobello, NB	EN	MT	CN	WE, SE
9/16/18	Minke		0.7 nm SSE of Rye, NH	EN	MT	US	PT
11/7/18	Minke		Tangier Island, VA	EN	MT	XU	NE
12/25/18	Minke		Yarmouth Bar, NS	EN	MT	XC	UN
3/27/19	Minke		Duxbury, MA	EN	MT	US	UN
6/5/19	Minke		Queensland Beach, NS	EN	MT	CN	UN
7/11/19	Minke		9.4 nm NE of Race Point, Provincetown, MA	EN	NS	XU	DE
8/1/19	Minke		2.2 nm NE of Rockport, MA	EN	NS	US	PT
8/4/19	Minke		6.0 nm E of Montauk,	EN	PR	XU	UN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
			NY				
8/9/19	Minke		Rigolet, Labrador	EN	PR	CN	NE
8/21/19	Minke		Mer et Monde, QC	EN	PR	XC	UN
9/1/19	Minke		31.3 nm SE of Chatham, MA	EN	PR	XU	UN
9/10/19	Minke		0.1 nm N of Mattinicus Rock, ME	EN	PR	XU	UN
9/19/19	Minke		off Burnt Island, ME	EN	MT	US	UN
2/21/10	Right	3945/Sharkbait	off GA	VS	NS	US	
5/13/10	Right	2470/Killick	49.7 nm ESE of Chatham, MA	EN	SIA	XU	UN
5/13/10	Right	2470/Killick	49.7 nm ESE of Chatham, MA	VS	NS	XU	
6/27/10	Right	1124/Tips	37.6 nm E of Cape May, NJ	EN	MT	XU	UN
7/2/10	Right	3901	26 mi SW of Grand Manan Island, ME	VS	MT	XU	
8/12/10	Right	1113/Trident	Digby Neck, NS	EN	MT	XC	UN
8/30/10	Right	3966	Jeffreys Ledge	VS	NS	XU	
9/10/10	Right	1503/Trilogy	15.5 nm NE of Gloucester, MA	EN	SI	XU	UN
10/20/10	Right	3120/Oakley	22.5 nm ESE of Portsmouth, NH	EN	NS	US	GN
12/18/10	Right	3140/Lou	Cashes Ledge	VS	NS	XU	
12/25/10	Right	3911/Bayla	14.6 nm SE of Jacksonville, FL	EN	MT	XU	PT
1/16/11	Right	4023/Wolverine	FL	VS	NS	XU	
1/19/11	Right	3010/Binary	12.8 nm ENE of St. Augustine, FL	EN	NS	US	UN
1/20/11	Right	3853	off South Carolina	VS	SI	US	
1/30/11	Right	3712	10.1 nm E of St. Augustine, FL	EN	NS	XU	NE
2/13/11	Right	3760/Callosity Back	30.2 nm E of Brunswick, GA	EN	NS	XU	GN
2/13/11	Right	3993	18.4 nm SSE of Tybee Island, GA	EN	SI	XU	UN
3/16/11	Right		Cape Island, SC	EN	MT	XU	UN
3/17/11	Right	3893	10.3 nm S of Race Point, Provincetown, MA	EN	NS	XU	GN
3/27/11	Right	1308	Nags Head, NC	VS	MT	US	
3/27/11	Right	2011 Calf of 1308	Nags Head, NC	VS	SI	US	
4/8/11	Right	3620/Lone Star	CCB	VS	NS	XU	
4/22/11	Right	3302	9.4 nm SW of Martha's Vineyard, MA	EN	SI	XU	UN
4/22/11	Right	4040/Chiminea	3.7 nm SE of Long Point, Provincetown, MA	EN	NS	US	PT
4/29/11	Right	3860/Bocce	CCB	VS	NS	XU	

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
4/29/11	Right	3123	9.1 nm S of Long Point, Provincetown, MA	EN	NS	XU	UN
4/29/11	Right	4092/Flare	CCB	EN	NS	XU	UN
7/19/11	Right	4160	Off Race Point, Cape Cod	EN	NS	XU	UN
8/3/11	Right	4150	Off Provincetown	VS	NS	XU	
9/3/11	Right	2660/Gannet	Gaspe Bay, QC	EN	SI	XC	UN
9/18/11	Right	4090	25.8 nm NE of Gloucester, MA	EN	PR	XU	GN
9/27/11	Right	3111	Bay of Fundy, 8.9 nm E of Grand Manan Island, NB	EN	PR	XC	UN
11/26/11	Right	1331/Trellis	83 nm E of Portland, ME	VS	NS	XU	
1/7/12	Right	3821/ZigZag	5.1 nm NW of Sesuit Harbor, MA	EN	NS	XU	GN
1/17/12	Right	4146	St. Augustine, FL	VS	NS	XU	
1/19/12	Right	1719	15.5 nm E of St. Simon's, GA	EN	NS	XU	UN
1/26/12	Right	3951/Domino	CCB	VS	NS	XU	
1/26/12	Right	4091	CCB	VS	NS	XU	
2/15/12	Right	3996/Calanus	0.5 nm S of Race Point, Provincetown, MA	EN	SI	XU	GN
3/4/12	Right	3701/Eros	Cape Cod Bay	VS	NS	US	
5/4/12	Right	2460/Monarch	Great South Channel	EN	NS	XU	UN
5/18/12	Right	3980	Franklin Basin	VS	NS	US	
7/19/12	Right		Point Rd, Maritime Beach, Clam Bay, NS	EN	MT	XC	UN
7/20/12	Right	3308/Sierra	Great South Channel	EN	NS	XU	UN
7/26/12	Right	1820/Cello	Cashes Ledge	EN	NS	XU	UN
8/4/12	Right	1278	Gulf of St. Lawrence	EN	NS	XC	UN
9/24/12	Right	3610	Bay of Fundy	EN	SI	XC	UN
12/7/12	Right		Wassaw Island, GA	VS	PR	US	
12/12/12	Right	3946	Cape Cod Bay	EN	NS	XU	UN
12/17/12	Right	4193	2.8 mi off Palm Coast, FL	EN	MT	US	PT
12/17/12	Right	3942	SEUS	EN	NS	XU	UN
1/29/13	Right	4540	8 nm off Mayport, FL	VS	NS	US	
3/7/13	Right	3692	off SC	VS	NS	US	
4/8/13	Right	3705/Checkmark	CCB	VS	NS	XU	
4/27/13	Right	2160	Mass Bay, MA	EN	NS	XU	UN
7/12/13	Right	3123	55.7 nm ESE of Virginia Beach, VA	EN	PR	XU	UN
9/20/13	Right	3946	38.1 nm SSE of Clark's Harbour, NS	EN	NS	XC	UN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
9/20/13	Right	1920	Roseway Basin	EN	NS	XC	UN
12/2/13	Right	3503/Caterpillar	25 nm E of Fernandina, FL	EN	NS	XU	UN
1/15/14	Right	4394	12 mi E of Ossabaw Island, GA	EN	SI	XU	UN
2/16/14	Right	4057/FDR	38 nm ESE of Amelia City, FL	EN	NS	CN	PT
3/1/14	Right	2479/Scoliosis	Cape Cod Bay	EN	NS	XU	UN
3/5/14	Right	2810	Cape Cod Bay	EN	NS	XU	UN
3/19/14	Right	3360/Horton	Cape Cod Bay	EN	NS	XU	UN
3/23/14	Right	1203/Senator	Cape Cod Bay	EN	NS	XU	UN
3/25/14	Right	1280/Luna	Cape Cod Bay	EN	NS	XU	UN
4/1/14	Right	1142/Kleenex	80 nm SE of Atlantic City, NJ	EN	SI	XU	UN
4/2/14	Right	3390	Cape Cod Bay	EN	NS	XU	UN
4/9/14	Right		Cape Cod Bay	VS	PR	US	
4/12/14	Right	3293/Porcia	Cape Cod Bay	EN	NS	XU	UN
6/29/14	Right	3333	100 mi S of Yarmouth, NS	EN	NS	XC	UN
6/29/14	Right	1131/Snowball	180 nm E of Provincetown, MA	EN	SI	XC	UN
9/4/14	Right	4001	7 nm SE of Grand Manan Island, NB	EN	SI	XC	UN
9/4/14	Right		114 nm SE of Saint Pierre & Miquelon, NL	EN	MT	XC	UN
9/17/14	Right	3279	9 nm SE of Grand Manan, NB	EN	SI	XC	UN
9/27/14	Right		36 nm S of Nantucket, MA	EN	MT	US	UN
12/18/14	Right	3670/Cherokee	11 nm E of Sapelo Sound, GA	EN	SI	XU	UN
4/6/15	Right	4370	Cape Cod Bay	EN	SI	XU	UN
5/6/15	Right	3999/Braid	7.0 nm S of Wood End, Provincetown, MA	VS	NS	US	
5/11/15	Right	4545	Cape Cod Bay	VS	NS	US	
6/13/15	Right		8.8 nm NW of Westport, NS	EN	PR	XC	UN
7/10/15	Right	4530	Gulf of St. Lawrence, QC	EN	NS	XC	UN
7/18/15	Right	3160/White Cloud	2.3 nm E of Ingonish Ferry, Cape Breton, NS	EN	SIA	CN	PT
8/7/15	Right	3229	35.9 nm SE of Perce, QC	EN	NS	XC	UN
9/2/15	Right	BK01MB15	Plymouth Bay, MA	VS	NS	US	
9/13/15	Right	1306/Velcro	33.4 nm SE of Cape Sable Island, NS	EN	NS	XC	UN

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9/13/15	Right	1327/Scoop	Roseway Basin, NS	EN	NS	XC	UN
9/28/15	Right		22.2 nm E of Cape Elizabeth, ME	EN	PR	XU	UN
11/29/15	Right	3140/Lou	6.4 nm E of Truro, MA	EN	SI	XU	UN
1/29/16	Right	1968/Quatro	Jupiter Inlet, FL	EN	SI	XU	UN
3/1/16	Right	4140/Casper	Cape Cod Bay, MA	EN	NS	XU	UN
3/8/16	Right	3229	Cape Cod Bay, MA	EN	NS	XU	UN
5/3/16	Right	4681	Morris Island, MA	VS	MT	US	
5/19/16	Right	3791/Truffula	20.2 nm E of Chatham, MA	EN	SI	XU	UN
7/26/16	Right	1427	Gulf of St Lawrence	EN	SI	XC	UN
8/1/16	Right	2608	Bay of Fundy, CAN	EN	NS	XC	UN
8/1/16	Right	3323	Bay of Fundy, CAN	EN	SI	XC	UN
8/13/16	Right	4057/FDR	3.25 nm E of Grand Manan Island, Canada	EN	SI	CN	PT
8/16/16	Right	1152/Necklace	2.0 nm S of Baccaro, NS	EN	PR	XC	UN
8/28/16	Right	2608	5.2 nm N of Brier Island, NS	EN	SI	XC	UN
8/31/16	Right	4320	Sable Island, CAN	EN	MT	CN	PT
9/22/16	Right	3823/Sundog	6.5 nm N of Race Point, Provincetown, MA	EN	SIA	US	PT
9/23/16	Right	3694	6.5 nm SE of Seguin Island, ME	EN	MT	CN	PT
12/4/16	Right	3405/Fuse	3.5 nm E of Sandy Hook, NJ	EN	PR	XU	NE
12/20/16	Right	2760	Massachusetts Bay, MA	EN	NS	XU	UN
1/5/17	Right	3530/Ruffian	17.6 nm E of Cumberland Island, GA	EN	SIA	CN	PT
4/13/17	Right	4694	Cape Cod Bay, MA	VS	MT	US	
4/23/17	Right	4146	2.9 nm W of Truro, MA	EN	NS	US	UN
6/19/17	Right	1402/Glacier	Gulf of St. Lawrence	VS	MT	CN	
6/21/17	Right	3603/Starboard	Gulf of St. Lawrence	EN	MT	CN	PT
6/23/17	Right	1207	Gulf of St. Lawrence	VS	MT	CN	
6/27/17	Right	1820/Cello	46.0 nm SE of Sainte-Marie Saint-Raphael, NB	EN	NS	XC	UN
7/4/17	Right	3139/Diablo	1.5 nm S of Nantucket, MA	EN	SI	XU	UN
7/5/17	Right	4510	37.9 nm SE of Sainte-Marie Saint-Raphael, NB	EN	SIA	CN	PT
7/6/17	Right		Gulf of St. Lawrence	VS	MT	CN	
7/8/17	Right	1317/Ergo	22.3 nm E of Sainte-Marie Saint-Raphael,	EN	NS	CN	PT

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
			NB				
7/9/17	Right	4123	22.5nm E of Sainte-Marie Saint-Raphael, NB	EN	SIA	CN	PT
7/19/17	Right	4094/Mayport	26.5nm SE of Sainte-Marie Saint-Raphael, NB	EN	SI	CN	PT
7/19/17	Right	2140/Peanut	Gulf of St. Lawrence	VS	MT	CN	
7/24/17	Right	G048	14.9 nm E of Sainte-Marie Saint-Raphael, NB	EN	NS	XC	UN
7/29/17	Right	1971/Nantucket	22.2 nm E of Sainte-Marie Saint-Raphael, NB	EN	NS	XC	UN
8/6/17	Right		Martha's Vineyard, MA	EN	MT	XU	UN
8/28/17	Right	3245/Zion	37.7nm SE of Gaspe, QC	EN	NS	CN	UN
9/15/17	Right	4504	Gulf of St. Lawrence	EN	MT	CN	PT
10/23/17	Right		Nashawena Island, MA	EN	MT	XU	UN
1/22/18	Right	3893	55 nm E of Virginia Beach, VA	EN	MT	CN	PT
2/13/18	Right	1817/Silt	CCB	EN	NS	XU	UN
2/15/18	Right	3296	33 nm off Jekyll Island, GA	EN	SI	XU	UN
2/24/18	Right	3823/Sundog	CCB	EN	NS	XU	UN
3/1/18	Right	4145	CCB	VS	NS	XU	
5/12/18	Right	4091	53.7 nm SE of Chatham, MA	EN	NS	US	UN
7/11/18	Right	4612	GSL	VS	SI	XC	
7/13/18	Right	3312	30.7 nm NE of Sainte-Marie Saint-Raphel, NB	EN	PR	CN	UN
7/21/18	Right	4601/Gully	GSL	EN	NS	XC	UN
7/30/18	Right	3843	13.2 nm E of Grand Manan Island, NB	EN	PR	XC	UN
8/20/18	Right	3960	43.1 nm ESE of Chandler, NB	EN	NS	CN	UN
8/25/18	Right	4505	10.4 nm S of Martha's Vineyard, MA	EN	MT	XU	UN
10/14/18	Right	3515	100 nm E of Nantucket, MA	EN	MT	XU	UN
12/1/18	Right	3208	30.8 nm S of Nantucket, MA	EN	SI	XU	UN
12/20/18	Right	2310	28.5 nm SE of Nantucket, MA	EN	PR	XU	UN
12/27/18	Right	3950	16.3 nm S of Nantucket, MA	EN	NS	XU	UN
2/20/19	Right	4615	CCB	EN	NS	XU	UN

Date	Taxon	ID	Location	Cause	Fate	Country of Origin	Gear Type
4/25/19	Right	4423	25.4 nm E of Orleans, MA	EN	SIA	XU	UN
6/4/19	Right	4023/Wolverine	46.4 nm ESE of Perce, QC	VS	MT	CN	
6/7/19	Right	3510	67.8 nm ESE of Perce, QC	EN	NS	XC	UN
6/20/19	Right	1281/Punctuation	27.3 nm E of Magdalen Islands, QC	VS	MT	CN	
6/25/19	Right	1514/Comet	20.3 nm E of Miscou Island, QC	VS	MT	CN	
6/27/19	Right	3450/Clipper	37.4 nm E of Perce, QC	VS	MT	CN	
6/29/19	Right	4440	24.2 nm E of Miscou Island, NB	EN	SIA	XC	UN
7/4/19	Right	3125	35.2 nm E of Perce, QC	EN	SI	CN	PT
8/6/19	Right	1226/Snake Eyes	36.4 nm NW of Iles de la Madeleine, NS	EN	MT	CN	UN
12/21/19	Right	3466	20.3 nm S of Nantucket, MA	EN	NS	XU	UN

CHAPTER 3 APPENDICES

Appendix 3.1 Decision Support Tool Model Documentation: Version 3.1.0

1. Introduction and Overview. The Right Whale Decision Support Tool was built to assist managers, decision makers, and stakeholders with visualizing and understanding spatiotemporal overlap between lobster fishing gear and North Atlantic Right Whale (NARW) distributions in the US, New England area and to model how risk of entanglement to NARW may change as a result of changes to the spatial distribution and configuration of lobster gear. Within the model, risk posed to the NARW population is calculated as the product of: (1) the density of vertical lines associated with lobster traps at a given location, (2) the threat vertical lines pose to NARW given the configuration of the lobster gear, relative to alternative gear configurations, and (3) the density of NARW expected at the given location. The DST is partially based on the Vertical Line Model (VLM) and Co-Occurrence Model developed by Integrated Economics (IEc, indecon.com) for NOAA since 2004. Many of the inputs to the DST that are comparable to the VLM have a similar format and maintain some backwards-compatibility for the purpose of data-sharing.

Similar to the IEc co-occurrence model, the DST quantifies risk as the geographic overlap of vertical lines and whale density, with an added allowance for varying levels of threat associated with different gear configurations. Thus, the DST does not attempt to incorporate more complex location- or situation-specific variables that may lead to severe entanglements including whale behavior (transiting vs feeding), adjacent gear density, or how environmental conditions affect the characteristics of vertical lines in the water, including line tension and orientation. While we have reason to believe that these factors are important, empirical data on these factors are generally insufficient to include in modeling at this time. Unlike the IEc models, the DST does not currently quantify the length of groundline attributed to lobster traps and associated threat to whales, though this may be incorporated in the future (Hamilton and Kraus 2019).

The DST further includes a capacity for users to test different management scenarios and get feedback on how a management scenario changed the spatial distribution and gear configurations of the lobster fishery. The DST was first introduced to the ALWTRT in April 2019 and has been further revised and expanded since this time based on feedback from stakeholders and CIE reviewers, management needs and the availability of additional data.

The spatial extent of the DST is comparable to the domain of the IEc vertical line model (Figure 2.1.a, Figure 2.1.b) and includes Lobster Management Areas (LMAs) 1, 2, the 2/3 Overlap, Outer Cape Cod (OCC), and much of LMA 3. This domain covers the vast majority of the US American Lobster Fishery including the Gulf of Maine, Georges Bank and much of the Southern New England lobster fishery. Other lobster management areas, including inshore and offshore areas off Connecticut, New York, New Jersey, Maryland and Delaware are not included as the lobster fisheries are much smaller in these areas, resulting in low gear densities, and Right Whale presence in these areas are expected to be very low with the exception of whales migrating to or from calving grounds further south along the US coast.

2. <u>Information Flow.</u> The DST is a deterministic series of calculations. All parameter estimation occurs outside the tool in submodels that have been previously constructed. Flow of information is one-way as shown in Figure 2.1 and narrated below.

2.1. The initial density of traps by location and month is loaded into the model.

2.2. User-inputs specify the spatial domain and fishery "fleet" to be tracked resulting in…

2.3. A constrained map of trap densities by month. At this step, the tool creates two copies of these "maps" and subsequently builds two data sets in parallel; a "Default" run and a "Scenario" run. The Default run has all submodels applied to it, sequentially changing traps into trawls, endlines, rope strengths, gear threats and whale risks. The Scenario run has the same submodels applied to it but is further modified by user specified management measures that affect the number of traps, trawl lengths, endlines, and rope strengths.

2.4. User specified inputs remove traps, implement trap caps, and spatial closures.

2.5. In the event of closures, redistribution rules can be implemented to move traps to adjacent areas….

2.6. Resulting in an updated spatial and temporal distribution of traps.

2.7. Representative number of traps in a trawl are included based on existing data.

2.8. Trawl length is further modified based on user-inputs.

2.9. Resulting in calculated trawl length by location and month.

2.10. Number of traps and trawl lengths are combined to calculate the number of trawls.

2.11. Endlines (either 1 or 2) are assigned to trawls based on trawl length. This is usually a simple rule like "trawls with more than five traps have two endlines."

2.12. Endlines per trawl are further modified by user input.

2.13. Resulting in total endlines by location and month.

2.14. Based on trawl length, appropriate distributions of rope diameters and resulting rope strengths are calculated.

2.15. Rope strength is further modified by user input.

2.16. Resulting in distributions of rope strength by location and month.

2.17. A gear threat model assigns threat scores to ropes based on rope strength.

2.18. Resulting in gear threat scores by location and month.

2.19. A whale abundance / distribution model is used to get whale densities by location and month.

2.20. Final risk values are calculated as the product of gear threat per endline, density of endlines, and density of whales.

The results of the Default and Scenario runs are then be compared to understand the approximate effectiveness of proposed management measures.

3. Basic Software Architecture. The current version of the DST is coded in the R language and is intended to be run from an Integrated Development Environment (IDE) like RStudio, Jupyter, or Notepad++. The DST code is written as an R function that is loaded into the workspace and then called from a script where the user is able to specify inputs and configurations for a model run including:

3.1. Function arguments:

3.1.1. Home directory: the parent directory for the DST function as well as standard subdirectories for other inputs and outputs.

3.1.2. InputSpreadsheetName: The name of a user-built .csv file that is contains the user-defined management actions to be included in the model run (Figure 2.1, right column).

3.1.3. TrapMapName: the filename of the TrapMap (spatio-temporal distribution of traps) to be used for the model run; 2.1 above.

3.1.4. WhaleInputModel: Filename of the whale density model to be used in the model run; 2.19 above.

3.1.5. TrawlLengthModelName: Filename of the desired trawl length model to be used; 2.7 above. No longer specified as it is loaded simultaneously with the TrapMap.

3.1.6. TrawlRopeStrengthModel: Modeled rope strength as a function of trawl length.

3.1.7. RopeStrengthResolution: Numeric; resolution at which rope strength should be modeled. Current inputs support resolutions up to 100lb increments. Higher resolutions dramatically increase memory use and model run time while low resolutions create model artifacts. 500lb increments seem like a reasonable compromise for most cases.

3.1.8. ThreatModel: Filename of the gear threat model to be used; 2.17 above.

3.1.9. UpdateEndlineStrength: Boolean (true / false) if endline strengths should be recalculated after trawl lengths are manipulated. This was added for cases where fishers are not expected to change endline strength in response to changing trawl lengths.

3.1.10. CoOccurrence: Boolean if the model should be run without applying a threat model.

3.1.11. TestScenario: Boolean if a Scenario should be performed in addition to the Default run. Sometimes the model is being run to examine spatiotemporal distributions and interactions of factors and there is no Scenario being tested. In this circumstance, not performing the Scenario run is a way to cut down on model run time.

3.1.12. HighResolution: Boolean if the model should be run in high- or low-resolution mode. While the primary spatial inputs to the model are stored at 1NM resolution, there is the option to aggregate data to a 10NM resolution, which drastically decreased model run time and required computing capacity at the cost of lost resolution and spatial averaging.

3.1.13. PrintTables: Boolean; should the summarized output from the model run be written to a pdf file after the model run?

3.1.14. PrintDefaultMaps: Boolean; should the maps accompanying the Default model run be included in output. Can be set to FALSE to decrease processing time if these maps are not desired.

3.1.15. PrintScenarioMaps: Boolean; should the maps accompanying the Scenario model run be included in output. Can be set to FALSE to decrease processing time if these maps are not desired.

3.1.16. PrintRedistributionMaps: Boolean; if traps are relocated as a result of a spatial closure, should the maps showing the redistribution of maps be included in output.

3.1.17. WriteMapSources: Boolean; should R-objects used to produce Default and Scenario maps be written to an .Rdata file? This is useful if one wants to generate maps with a presentation different than that provided by the tool.

3.1.18. WriteOutputCSV: Boolean; should the summarized output from the model run be written to a .csv file for later use?

3.1.19. WriteDetailedOutput: Boolean; should all major R-objects generated in a model run be written to an .Rdata file for later analysis? Option to save on model run time and memory space used by model output. Detailed output for model runs at high resolution and / or large spatial extents can exceed 10Gb of drive space.

3.2. Once the function is called, the IDE provides status messages and warning messages for non-fatal issues encountered. Upon successful completion of a model run, all output is written to a new directory in a designated location for review.

4. Model Inputs, User Inputs and SubModels. The DST has a modular design, consisting of several inputs that are used to initialize a model run and a number of submodels that are used within a model run to perform necessary calculations and transformations. These inputs and submodels are built outside the DST and can be readily substituted for alternative inputs and submodels at the time the model is run.

4.1. Trap and Vertical Line Densities. One of the primary inputs to the DST is a data layer with the density of lobster traps throughout the domain of the model at a 1 NM spatial and monthly resolution; i.e. a "TrapMap". The TrapMap with co-located information on trawl length is the basis for calculating vertical line density at the same spatial and temporal resolution.

Despite being one of the most valuable fisheries in the US, data that allow quantifying fishing effort at fine spatial scales is generally lacking as there are no Vessel Monitoring System requirements and trip reports for vessels fishing state waters generally only record fishing regions. For vessels with federal permits, there is currently no trip reporting requirement for the lobster fishery, though many of the larger vessels carry groundfish permits that require trip reporting, in which case they report a set of "representative coordinates" for each statistical area fished on each trip. As a result, the spatial distribution of traps and gear configurations is built using location-specific methods for different states and the offshore fishery.

The density and distribution of traps as well as trawl configurations for inshore LMAs (1, 2, 2/3 Overlap and OCC) were adopted from the IEc Vertical Line Model model (IEc REF). A similar model of trap densities and trawl lengths had been produced by IEc for offshore Area 3. However, a different approach was employed for the current version of the DST, parameterized from data from federal Vessel Trip Reports (VTRs) and Northeast Fishery Observer Program (NEFOP) data in an attempt to better capture spatial variations in fishing effort and vertical line densities.

4.1.1. IEc Vertical Line Model. DST inputs for trap densities and trawl lengths for LMA 1, 2, the 2/3 Overlap, and OCC come from the IEc Vertical Line Model. In general, the area adjacent to each state within the inshore LMAs is divided into finer-scale polygons and data values are assumed to be homogeneous within them. Based on harvester reporting or surveys, "vessel classes" are identified within a region, based on trap allocations and trawl configurations. For each subregion, the number of traps represented by each vessel class is estimated from the number of active vessels represented by a given vessel class and the trap allocation of that vessel type (NMFS Co-Occurrence Model 2019).

4.1.1.1. Maine Traps and Vertical Lines. For Maine, the subregions are defined based on Maine's seven lobster management zones and distance from shore including exempt state waters, non-exempt state waters, federal waters 3-6 miles from shore, federal waters 6-12 miles from shore and federal waters 12+ miles shore (Figure 4.1.1.1.a). Number of active vessels were determined based on permitting and landings data. Unique vessel classes, number of traps fished and traps per trawl were based on an annual mail-based survey of lobstermen.

4.1.1.2. New Hampshire Traps and Vertical Lines: The relatively small area of state waters for New Hampshire are identified explicitly in the IEc model but federally-permitted vessels fishing out of New Hampshire are intermixed with federal vessels from Maine and Massachusetts. Number of active vessels, vessel classes, traps fished, and trawl lengths were calculated based on harvester reporting.

4.1.1.3. Massachusetts Traps and Vertical Lines For Massachusetts, fishing activity is spatially modeled at the scale of Statistical Reporting Areas (SRAs, figure 4.1.1.3.a) and include the southern portion of LMA1, OCC, eastern LMA2 and the 2/3 overlap. Number of active vessels, vessel classes, traps fished and trawl lengths were calculated from trip-level and annual reporting.

4.1.1.4. Rhode Island Traps and Vertical Lines. Rhode Island provided the data for the western portion of LMA 2, covering the extent of Statistical Area 539 (Figure 4.1.1.4.a). Harvester logbook data allowed for spatially dividing this area into state waters, federal waters between 3 and 12 miles from shore and federal waters greater than 12 miles from shore. The logbook data was also used to calculate number of vessels and define vessel classes, fishing effort, and trawl configurations.

4.1.2. Vertical line model for offshore LMA 3. Lobster vessels fishing in the offshore LMA3 do not submit to state logbook reporting programs. While federal lobster vessels are not required to file federal Vessel Trip Reports (VTRs), most lobster vessels in LMA3 do have VTR requirements due to other permits the vessels carry. However, the federal VTR was designed for mobile gear and, thus, collects minimal data on fixed gear configurations.

IEc previously built a vertical line model for LMA3 based on coordinates reported on VTRs, with fishing effort from vessels without trip reporting spread homogeneously over the region. Because lobstermen often reuse the same set of coordinates for long periods of time, the result was an unrealistically patchy distribution of fishing effort with many areas of known offshore lobster habitat showing little or no effort. Further, trawl configurations and seasonality were largely informed by expert advice rather than empirical data.

We attempt to improve on this using a combination of observer data, landings, and federal VTRs. Observer data provides gear configurations and catch-per-trap. This observer data, combined with dealer landings are used to estimate total vertical lines. Finally, coordinates from VTRs, combined with a bathymetry map are used to spatially allocate fishing effort across lobster habitat. The offshore pot/trap fishery in this area actually consists of two overlapping fisheries: American lobster and Jonah crab (*Cancer borealis*). Both species are fished with lobster pots with only minor differences in gear modifications. Vessels with federal lobster permits can freely target either species and vessels, particularly in Southern New England, often switch between species seasonally, though several vessels now fish Jonah crab almost exclusively. Because the Jonah crab fishery is more spatially and seasonally constrained, we model the two fisheries separately in the DST to better understand if management measures would affect the two fisheries differently. Also, through visual examination of the distributions of fishing effort and observer data, we identify two general vessel classes for the offshore fishery, one for larger ~60'+ "Offshore" vessels that conduct longer, multi-day trips to the edge of the continental shelf, Georges Bank, and the Gulf of Maine along the Hague line and a class of smaller "MidShelf" vessels that tend to fish single-day trips on the continental shelf, Great South Channel and central Gulf of Maine, and model them separately.

4.1.2.1. Gear characterization and catch rates from observer data. Federal fisheries observers with the Northeast Fisheries Observer Program record detailed haul-level data and observations on fishing activities including catch rates, trawl lengths, soak times, vertical line diameters. Because there is no federal mandate to place observers on federal fishing vessels, there is very little dedicated observer effort in this area. However, there was additional observer effort in 2014 and 2015, partially funded by a grant for a tagging study of lobsters in this region and partially due to a need to document groundfish bycatch rates (Table 4.1.2.1.a). While this is not a large data set, we use it to inform the model inputs where possible.

We estimate the number of vertical lines by stat area and month by:

$$\text{VerticalLines}_{(\text{Stat, Month})} = \text{Landings}_{(\text{Stat, Month})} / \text{CatchPerVerticalLine}_{(\text{Stat, Month})}$$

Where Landings by Stat Area and Month come from dealer reports that include vessels that don't have VTR requirements. Catch per vertical Line is estimated as:

$$\text{CatchPerVerticalLine}_{(\text{Stat, Month})} = \text{CatchPerTrawl}_{(\text{Stat, Month})} * \text{EndlinesPerTrawl}_{(\text{Stat, Month})} * \text{TrawlHaulsPerMonth}_{(\text{Stat, Month})}$$

Where

$$\text{CatchPerTrawl}_{(\text{Stat, Month})} = \text{CatchPerTrap}_{(\text{Stat, Month})} * \text{TrapsPerTrawl}_{(\text{Stat, Month})}$$

4.1.2.2. Catch Per Trap. Retained catch is recorded by observers on a per-trawl basis rather than a per-trap basis. Because we wanted to build our model up from traps, we first divided the retained catch per trawl by the number of traps in the trawl, then modeled individual trap CPUE with one data point per trawl observed. Lobster CPUE was estimated using a General Additive Mixed-Effect Model assuming a Gamma error distribution and vessels and trips as nested random effects. Seasonal variation was included in the model as a cyclical spline with separate intercepts for fleet and statistical areas (Figure 4.1.2.2.a). Individual data points were weighted by the square-root of the trawl length to account for the decreased variability in CPUE associated with longer trawls.

The same model was used for Jonah crabs except that only core statistical areas of the Jonah fishery (537, 525, and 526) had sufficient data to support this level of complexity. Trap CPUE for the remaining statistical areas, where less data were available and there is less effort and landings, were estimated as the average CPUE from the three core statistical areas (Figure 4.1.2.2.a).

4.1.2.3. Trawl Hauls Per Month The number of times that a trawl was hauled in a month was calculated by modeling the duration between trawl hauls (soak time) and dividing the number of days in a month by estimated soak time. Both lobsters and Jonah crabs were modeled using a using a General Additive Mixed-Effect Model assuming a Gamma error distribution with vessels and trips as nested random effects. Seasonality was modeled as a cyclical spline with separate intercepts for fleet and statistical area. The resulting predicted soak times (Figure 4.1.2.3.a) where then used to estimate hauls per month (Figure 4.1.2.3.b).

4.1.2.4. Traps Per Trawl. We estimated the number of traps per trawl for the lobster fishery using linear models with separate intercepts for statistical areas and fleets with vessels and trips as nested random factors (Figure 4.1.2.4.a). For Jonah crabs, the data only supported estimating a grand mean with vessel and trips as nested random factors. For both the lobster and crab fishery, there was insufficient evidence of seasonal changes in trawl length to include a temporal variable.

4.1.2.5. Total LMA3 Vertical Lines. Total vertical lines in LMA3, as calculated above closely matched the aggregate line estimates from the IEc model (Table 4.1.2.5.a), which is reassuring with both estimates comparable to estimates provided by industry. Interannual range in marginally higher for the updated model and higher than would be expected, given that most of this gear is part of a year-round fishery, which suggests that the model could be improved with additional data. We chose to use this updated model going forward as it allowed for modeling the two fisheries separately and provided realistic spatial and temporal variations in gear characteristics.

4.1.2.6. Spatial distribution of effort in LMA3. We used the above estimates of vertical lines by statistical area and month, combined with VTR reported coordinates and a bathymetry layer to spatially allocate effort in LMA3, based on the observation that fishing effort tends to be oriented along isobaths but moves about seasonally. We binned the bathymetry map into 50m intervals and used spatial overlay to get the bathymetry bin associated with landings from VTR. We then summed landings across trip reports by depth bins, statistical area and month to get the proportion of landings represented by each depth bin within a statistical area and month (Figures 4.1.2.6.a, Figure 4.1.2.6.b). We then applied these proportions to the number of vertical lines to get lines by depth bin and distributed these lines homogeneously across the depth bin within the statistical area, based on the bathymetry map (Figure 4.1.2.6.c, Figure 4.1.2.5.d). While some modeling artifacts are evident in these maps, we consider this more realistic than distributing gear and vertical lines based solely on raw VTR coordinates or a homogeneous spread across the entire statistical area.

4.1.3. The resulting final input of trap density and default line density model for the DST are shown in Figures 4.1.3.a and 4.1.3.b.

4.2. User-defined spatial and fleet filter. When setting up a DST run, users have the option to specify which fleets will be included or excluded from the model run and specify a spatial constraint. For inshore LMAs, fleet options include state exempted waters, state non-exempted waters, and federal waters. For the offshore LMA3, the fleet options include the MidShelf vs Offshore fleet and Lobster vs Jonah Crab fishery. Spatial constraints can be specified by any combination of State, LMA, Statistical Area or a user-provided shapefile. Only traps associated with the specified fleet and falling within the specified spatial region are retained for the remainder of the model run.

4.3. Trap removal models. During Scenario runs, users can specify three different types of management actions that affect the number and distribution of traps in the model; general trap removals, implementation of new trap caps, and spatial closures.

4.3.1. Trap removal. Trap removals are specified by percentage and can be spatially constrained by state, LMA, statistical area, or shapefile. Within the specified domain, the given percentage of traps are evenly removed from the Scenario run. This option does not assume any particular method by which traps are removed.

4.3.2. Trap Caps. Trap caps operate by lowering the maximum number of traps that individual fisherman are allowed to fish. The submodel for trap caps is built from vessel reports where fishermen have reported the total number of traps being actively fished. A separate trap cap model is produced for each spatial region and month.

At the time of writing, trap caps are only an option for Maine LMA1 state and nearshore waters with spatial models for Maine's seven lobster zones and distances of <3, 3-12, and 12+ miles from shore. Data for the number of traps fished come from Maine's harvester reporting, which includes a 10% subset of lobster license holders in any given year. For each individual lobster license holder and month, we calculate the average number of reported traps fished. For each license type, spatial region and month, we then assemble the fishermen who reported any fishing and calculate a cumulative quantile curve of the number of traps being fished. For any case where data are not available for any combination of license type, region and month, quantile profiles are first borrowed across lobster zone, then month as is necessary to fill all cases. Each of the quantile profiles are then weighted across license type by the proportion of active fishers with that license type, based on dealer reporting, to create a general quantile profile for a zone, distance from shore, and month. Figure 4.3.2.a shows an example set of quantile profiles for Maine Zone B. Given that the area under each curve represent 100% of traps fished, the proportion of traps that would be retained with the implementation of a trap cap can be calculated as the total area under both the quantile curve and horizontal line defining the trap cap, divided by the total area under the quantile curve. This method assumes that, as a fisher reduces the number of traps fished, traps are removed equally over the area they are fishing (i.e. a federally permitted fisher with traps in both 3-12 mile and 12+ mile regions will not remove all affected traps only from the 12+ region), rather than a fisher shrinking the footprint of their operation. The entire TrapCap model for Maine is depicted in Figure 4.3.2.b.

4.3.3. Spatial Closures. Spatial closures are specified via a shapefile and temporally by month or month range. It is further possible to apply a percentage to a closure, specifying what portion of the gear should be removed, which roughly approximates a closure for a portion of a month. With the specification of a closure, the affected traps within the closure are identified and the model attempts to redistribute these traps to adjacent areas. The actual industry response to a closure would be idiosyncratic and difficult to predict but a crude model is currently employed in some attempt to depict the displacement of gear.

First, the adjacent areas where gear can be moved to are identified based on a basic set of rules whereby traps cannot move between federal and state waters under the assumption the affected fishers may not have a permit to fish in these areas. Further, the adjacent areas available to trap redistribution is limited to be more realistic and to speed computing time. For example, in Maine, gear cannot move beyond the adjacent lobster zone to reflect management rules on how much gear can be fished outside a fisher's "home" zone. For Massachusetts and Rhode Island, gear can be redistributed anywhere within the same LMA. For offshore LMA3, each statistical area has a pre-identified set of adjacent statistical area that were judged to be within a reasonable neighborhood.

Second, the pair-wise distances are calculated between all traps inside the perimeter of the closure and adjacent traps inside the closure. The “cost” of moving traps to any adjacent pixel is then assumed to be a linear function of the total distance a trap would have to be moved to the adjacent pixel calculated as the summed distance between traps inside the closure and the distance to the adjacent pixel. The cost associated with each adjacent pixel is then weighted by the quality of lobster habitat in that pixel, measured as the density of traps already in the pixel. The weighted cost at each pixel is then divided by the summed weighted cost for all pixels and multiplied by the total traps to be moved to get the number of traps redistributed to each pixel. Figure 4.3.3.a shows a diagram illustrating this process. Figure 4.3.3.b shows an example of redistributed traps given the closure of the Canyons and Seamounts National Monument.

4.4. Traps Per Trawl Model and Number of Trawls To convert traps to trawls, the DST uses a different approach for inshore and offshore LMAs. For inshore LMAs, the DST uses the number of traps in a trawl from the IEc model, given the location and vessel class associated with the traps. For offshore LMA3, The DST uses the statistical model outlined in 4.1.2.4. The number of trawls at a location is then calculated based on the number of traps in a trawl and the number of traps at a location. For a management scenario, users can further specify a minimum, maximum or exact number of traps to occur in a trawls for a location and time period and the trawl length is truncated appropriately and the resulting number of trawls recalculated accordingly. Figure 4.4.a shows the mean trawl length for a default model run.

4.5. Endlines Per Trawl Model Based on the number of traps in a trawl and the trawl location, the number of endlines on each trawl (one or two) and total endlines at location are then calculated. For New Hampshire, trawls with three or less traps have one endline. In all other locations, trawls with four or less traps are assumed to have one endline. All other trawls have two endlines. For a management scenario, users can further specify the maximum trawl length that has a single endline.

Users are also able to implement ropeless fishing scenarios within specified spatial regions and time via either acoustic release buoys or timed tension release buoys. Buoys associated with ropeless fishing will presumably spend some period of time at the surface but exact numbers are hard to provide as this is still largely untested technology. Thus, we currently use the model-estimated mean results from the TRT Opinion Poll (Section 4.7.1) which allows for an 88% reduction in lines for acoustic releases and a 52% and 46% reduction in lines for timed releases inside and outside of 12 miles offshore respectively. Figure 4.5.a shows the density of endlines for a default model run.

4.6. Line Diameter and Rope Strength Model The DST attempts to quantify how gear configuration contributes to entanglement risk for Right Whales. In early versions of the DST, gear threat was based on both rope diameter and trawl length as primary factors. Because the breaking strength of rope is considered a one of the biggest contributors to entanglements that result in severe injury or death and the observed high variability in rope strength at a given rope diameter, DST version >2.0.0 captures gear threat entirely on estimated rope strength with other aspects of gear configurations to be added at a future time. However, our primary data source on the relationship between trawl length and endline characteristics comes from the NEFOP observer data which only recorded rope diameter. Thus, calculating the rope strength associated with trawl lengths requires first characterizing the distribution of rope diameters observed for a given trawl length and then deriving a relationship between rope diameter and rope strength.

4.6.1. Predicted Rope Diameter from Trawl Length. For each observed trawl, observers recorded the trawl length and endline diameter. To characterize the expected distribution of rope diameters for a given trawl length, we truncated the rope diameter data at 5/16" and 3/4" to remove a few outliers, rescaled the rope diameters a range of zero to one, and fit the data to a logistic regression (Figure 4.6.1.a, Figure 4.6.1b).

4.6.2. Predicted Rope Strength from Rope Diameter. Data on the breaking strength of ropes from the lobster fishery came from two sources. Knowlton et al. (2016) acquired samples of rope taken from whale entanglement events and tested their breaking strengths. Data from these ropes are further characterized by polymer and fiber type, the condition of the rope (five levels: Very Good to Very Poor), if the rope was leaded, and the test type used to determine breaking strength (whole rope vs. individual fibers). The Maine Department of Marine Resources (DMR) provided an additional data set from a recent study where lobstermen voluntarily submitted samples of endline for testing. This data was further characterized by age (number of seasons fished), and a descriptor of the rope segment (clear line, joined by a splice, or joined by a knot). To maximize the size of the data set, we looked to match as many of the attributes between the two data sets as possible.

For the data from Knowlton, we noted from residual analysis that rope condition at five levels had a remarkably linear trend. Thus we recoded this attribute with numeric values from one to five and treated this as a continuous variable comparable to age for the DMR data. Second, we quantified the storage effect as the number of years between collection and observation, using Jan. 1, 2015 as a best-guess test date, resulting in a mean storage time of 12.2 years (range 4.6 to 20.1 years). Storage was not a large effect in the final model so this assumption of test date has minimal effect on outcomes. Finally, we coded all data as "clear" rope samples. Unfortunately, rope material was not available for much of the DMR data, so material type was dropped from the Knowlton data set. For the DMR data, we assumed the rope was not leaded and a storage time of 1 year.

With the combined data set, the best linear model included (1) a rope diameter interaction with section type (clear, spliced or knotted), (2) and interaction between rope age and source (DMR vs Knowlton) to capture the different metrics of age between the data sources, (3) test type as a factor (whole rope or rope fiber), and storage time as a continuous variable, with a log-normal error distribution. Final model r-square was 0.58 with 290 degrees of freedom. As expected, rope diameter was the strongest predictor of breaking strength, increasing in breaking strength by 32.6% per 1/16th inch (Figure 4.6.2.a, 4.6.2.b). Splices and knots in ropes are predicted to decrease breaking strength by 22.5% and 39.3% respectively and rope is predicted to weaken at a rate of 4.4% annually when fished and 1.1% annually when stored, though this storage effect also accounts for changes in rope technology and tends to be an unstable parameter estimate.

Finally, to characterize the expected age distribution of ropes in use by the fishery, it was necessary to model the rate at which endlines are lost or replaced to get the proportion of rope at each age in the "rope population". As empirical data on this was not readily available, collaborators at Maine DMR observed that fishermen have a 10% loss allowance for lobster traps that seem to be similar to the actual rate of gear loss and that, of the samples submitted for strength testing and slated for removal, most were between 3 and 6 years of age. Thus, we assume 10% stochastic removal rate of endlines due to loss and the mean age of removal at 4.5 years with a standard deviation of 1. The product of these two curves (Figure 4.6.2.c) results in the distribution of rope ages one would expect to observe in the fishery and can be used to predict rope strength.

4.6.3. Predicted Rope Strength from Trawl Length To obtain distributions of rope strength given trawl length, we created 1,000 random draws from the predicted rope diameter distribution for each trawl length, matched each with an appropriate random draw from the age distribution, and used this to predict a mean rope breaking strength using the statistical model from 4.6.2, then added a random draw from the rope strength model error distribution. We then binned the calculated rope strengths from each trawl length into to 100-pound bins and calculated proportions represented by each bin. Resulting distributions are strongly right-skewed, particularly for short trawl lengths where both the rope diameters and rope strength distributions are right-skewed. Single-pot trawls, for example have a median breaking strength of 2,000 lbs but a range from less than 1,000 to greater than 5,000 lbs (Figure 4.6.3.a). As expected, longer trawls are predicted to have endlines that break at much higher loads with median breaking strength for a 50-pot trawl around 7,000 lbs (Figure 4.6.3.b). As a management action, users are able to specify a maximum rope breaking strength seasonally and spatially in scenarios.

4.7. Gear Threat Model Much of the interest in this tool is to provide some quantitative analysis of how changes in gear configurations (rope strength, trawl length, buoyless fishing, etc.) can contribute to decreasing risk to whales. However, quantitative data is largely lacking on the relationship between gear configuration and the probability of causing a severe injury or mortality. Notably, Knowlton et al. (2016) examined the breaking strength of ropes retrieved from entanglement mortalities or disentanglement events and observed that entanglements involving larger whales tended to occur in stronger lines. However, this falls short of providing an estimate of how any two gear configurations compare.

4.7.1. Expert Opinion Poll for the April TRT meeting. Given short notice but a desire to fill this portion of the decision tool, NMFS constructed and distributed a questionnaire to the members of the Take Reduction Team and other experts in the field ahead of the April 2019 meeting, asking participants to provide best-guess, relative threat scores for a variety of gear configurations. Results were highly variable, particularly across different stakeholder groups, though respondents generally agreed that lighter ropes posed less threat to whales than heavy ropes (Figure 4.7.1.a). The results were analyzed using hierarchical Bayesian models with stakeholder groups as random effects and resulting models were interpolated to provide threat scores for all desired gear configurations (Figure 4.7.1.b). While the allowed for initial use of the model and testing of alternate gear configurations, there was a general consensus among TRT members and stakeholders that the poll-based threat model should be replaced with a model based on quantitative analysis of empirical data.

4.7.2. Empirical models of gear threat. Building an empirical model of gear threat for the DST has proved to be very challenging as it is necessarily attempting to distill the factors that contribute to complex outcomes for events that are generally rare and not directly observed. Most data on whale entanglements come from mortality or disentanglement events, both of which occur a considerable amount of time after the entanglement event took place. In both cases, the whales are generally not carrying the complete set of gear that they were entangled in. Because disentanglement is not attempted for minor cases, there is also necessarily a small amount of data on gear that does not result in serious injuries or mortality for comparison.

4.7.2.1. Threat model based on apparent selectivity by rope strength. The gear threat model currently implemented in DST V2.x quantify threat of different rope strengths based on the discrepancy in rope strength distributions between ropes recovered from severe entanglements and the ropes that whales are expected to encounter. Our data on the distribution of rope strength observed in entanglements comes Knowlton et al. 2016, subset to entanglements judged to represent serious injury cases. To get the distribution of rope strengths we expected whales to encounter, we used model runs of the DST, including a run with a humpback habitat model provided by collaborators at Duke University, and extracted the densities and strength of endlines with co-located densities of whales (See 4.8 Whale Habitat Models). We then took the product of the numbers of ropes for each strength interval and whale density by location and summed across locations to get the relative proportion of each rope strength, by species, that whales would be expected to encounter (Figure 4.7.2.1.a). For both Right and Humpback Wales, there is some evidence of heavier ropes being more common in entanglement events than expected from encounter rates (Figure 4.7.2.1.b, 4.7.2.1.c). However, both sets of profiles also have higher than expected proportions of entanglements in the lightest ropes and lower than expected proportions in intermediate-weight ropes.

We use the ratio of the two sets of proportions (Observed vs Encountered) as a proxy for the threat associated with ropes of a given length. I.e. if a rope of a given strength is observed in entanglements twice as often as would be expected, we interpret this as being twice as lethal as a rope that is observed in proportion to the expected encounter rate.

For model fitting, we aggregated rope strengths to 500lb intervals and truncated all data below 1,250 lb. and above 5,250 lb. strengths, with values outside these bounds added to the nearest bin to reduce the sensitivity of ratios to very low numbers in denominators. We then bootstrapped the observed rope strength distribution 100 times, calculated observed-to-expected ratios, and rescaled the data to have all ratios less than 1. We then combined the data sets for the two species and fitted a binomial glm with separate intercept for the two species. The resulting glm model was then back-transformed to the original scale of the data and plotted over the bootstrapped data sets (Figure 4.7.2.1.d). The trendlines for both species increase with rope strength, again suggesting that threat increases with rope strength. However, there is some lack-of-fit to the models with apparent threat being over-estimated at intermediate rope strengths and underestimated at higher rope strengths, indicating an artifact in the derived data sets or mis-specification of the statistical model. However, we judge this to be the best candidate method for deriving an empirical threat index based on rope strength, providing a threat score for any given rope strength.

Given the above issues with the model fit, we used the above bootstrapping method to further develop estimates of the uncertainty or instability of models around the relationship between 'observed' and 'expected' rope strength distributions. The goal of this approach is to define a reasonable upper and lower bound on how rope threat, calculated from the selectivity ratios, changes with rope strength.

Rather than using bootstrapping to define the range in selectivity ratios predicted for a given rope strength, it is more appropriate to quantify uncertainty as the range of models produced by the bootstrapping (Figure 4.7.2.1.e). As expected, model parameters (intercept, slope, and species interaction) are highly correlated, particularly slope and intercept. A principal components analysis of the parameter estimates suggests that >90% of variability in parameters can be explained by the first principal component, which correlates strongly with slope parameters (Figure 4.7.2.1.f). Thus, we define median, upper, and lower bounds on the model estimates as the models from the 0.5, 0.975, and 0.025 quantiles of the first principal component (Figure 4.7.2.1.g). These upper and lower bounds correspond with expected limits on how steep the relationship is between rope strength and gear threat, which also provide limits on the relative benefits of decreasing entanglement risk by changing rope strength. While the curve representing the lower bound has higher "threat scores" than the other two curves for ropes less than ~6,000 lbs breaking strength, it is important to recognize that relative threat score between any two rope strengths defines actual entanglement threat, not absolute individual values. Thus, it is instructive to plot the ratios of combinations of values for each curve to understand the inferred threat reductions (Figure 4.7.2.1.h-j). Similarly, it is instructive to examine individual profiles for each threat curve at a given target managed rope breaking strength, like 1,700lb (Figure 4.7.2.1.k). For changing to 1,700 lb breaking strength, the median model predicts a 50% reduction in risk from a 3,100 lb rope and 75% reduction in risk from a 4,700 lb rope. The upper bound curve predicts a 50% reduction in risk switching from 2,600 lb rope to 1,700lb and a 75% reduction switching from 3,400 lb rope. Conversely, the lower bound curve predicts that 50% reduction does not occur within the domain of the model with changing from 10,000 lb rope to 1,700 rope results in only a 38% reduction in risk.

These three curves have been implemented as alternate threat models in DST V>2.1.x. Thus, the updated model produces output results and risk scores for all three threat models as well as a "co-occurrence" model where all ropes have equal threat, providing a range of outcomes given the uncertainty in the threat model.

For example, figures 4.7.2.1.k – n show output from an example DST model run where all ropes >2,250 lb breaking strength were decreased to exactly 2,250 lbs. Figure 4.7.2.1.k depicts the differences in rope strength distribution between the right-skewed default condition and the scenario condition where rope strengths have been truncated to 2,250lbs breaking strength. Figure 4.7.2.1.l shows the resulting truncated distribution in resulting threat scores for the median threat model. Truncation in threat scores is less apparent for the lower bound curve (Figure 4.7.2.1.m) and more apparent for the upper bound curve (Figure 4.7.2.1.n). In this example, setting max rope strength at 2,250 lbs. results in a mean reduction of rope strength of

26% (Table 4.7.2.1.a) corresponding in a reduction in gear threat of 40% from the median threat curve (Table 4.7.2.1.b) but a range of 5 – 68% from the lower and upper bound curves respectively (Table 4.7.2.1.b and c). Similar tables are also produced for the co-occurrence model (all ropes have equal threat) but are not presented here as numbers from co-occurrence calculations only change if the number of ropes in the water are affected by the scenario.
This modeling framework seems useful for conveying uncertainty in the outcome of management actions through manipulating rope strengths. This does not address the uncertainty associated with the threat modeling methods, recognizing the difficulties discussed above. We anticipate further developing the modeling methods as well as seeking additional data to include in the analysis but would expect to keep presentations of uncertainty like these in future versions of the model.

4.8. Whale Habitat Models The spatial and temporal distribution of whales within the model domain is adapted from the Right Whale Habitat model from Roberts et al. (2016). In short, the model uses whale citing data from a variety of sources, matched with co-located oceanographic and habitat variables to predict whale density at any given location. The right whale habitat model has been updated over the past two years with a number of improvements. Recognizing that whale distributions and seasonal migration patterns have changed over the past decade, the whale distribution model now has three options for inputs, one model for the past decade (2010 – 2018), a second for the previous decade (2003 – 2009) and a third for the entire time series. We used the recent decade model as the default for all current analysis and used the other two models for some explorations of uncertainty in whale distributions and robustness of management plans. The updated models are estimated at a 5km pixel resolution and was translated to the domain of the DST by overlaying the points within the DST domain on the whale habitat model raster and extracting the overlapping values. Thus, whale density values for individual pixels in the DST will have the same value as some neighboring pixels if they fell into the same cell in the original whale model. (Figure 4.8.a and b).

5. Model Outputs Upon completion of a model run, a new directory is created to house the output and the following are saved to review the results of the model run and scenario tested.
5.1. Monthly Maps of the following Default conditions:
5.1.1. Trap density
5.1.2. Mean trawl length
5.1.3. Vertical line density
5.1.4. Mean vertical line strength
5.1.5. Mean gear threat score
5.1.6. Total threat score (gear threat * line density)
5.1.7. Whale density
5.1.8. Total risk (total threat * whale density).
- An .Rdata file with the individual data objects used for creating these maps is also saved to custom maps can be created after the model run.

5.2. Monthly Maps of the following Scenario conditions:
5.2.1. Trap density before scenario effects on traps
5.2.2. Trap density after trap reduction
5.2.3. Trap density after implementation of trap caps

5.2.4. Trap density after implementation of closures
5.2.5. Map of traps relocated as a result of closures
5.2.6. Trawl lengths after scenario effects
5.2.7. Line densities after scenario effects
5.2.8. Mean line strength after scenario effects
5.2.9. Mean gear threat after scenario effects
5.2.10. Total gear threat after scenario effects
5.2.11. Whale densities
5.2.12. Total risk scores.
5.2.13. Monthly Maps of spatial changes in risk due to mitigation measures.

An .Rdata file with the individual data objects used for creating these maps is also saved to custom maps can be created after the model run.

5.3. Output tables with the following
5.3.1. Model documentation
5.3.1.1. Model configuration settings
5.3.1.2. Contents of the input spreadsheet

These two outputs allow users to fully understand the settings of a model run as well as recreate the model run at a later time.

5.3.2. Tables with monthly values for default and scenario conditions
5.3.3. Initial and final trap numbers
5.3.4. Total number of trawls
5.3.5. Mean trawl length
5.3.6. Total vertical lines
5.3.7. Mean vertical line strength
5.3.8. Mean threat score per vertical line
5.3.9. Total gear threat
5.3.10. Seasonal whale density
5.3.11. Total risk scores

All summary statistics written to the tables are also written to a comma-separated text file for further access.

5.4. Optional extended output with full-resolution R data objects of the model run at all stages for further analysis.

6. Literature Cited:

Hamilton PK, Kraus SD. 2019. Frequent encounters with the seafloor increase right whales' risk of entanglement in fishing groundlines. Endangered Species Res. 39:235-246.

Knowlton AR, Robbins J, Landry S, McKenna HA, Kraus SD, Werner, TB. 2016. Effects of fishing rope strength on the severity of large whale entanglements. Conserv.Biol. 50.318-328

NMFS Co-Occurrence Model. 2019. Prepared by Industrial Economics, Incorporated for the National Marine Fisheries Service Greater Atlantic Fisheries Office and the Atlantic Large Whale Take Reduction Team.

Records et al. 2019. Rapid climate-driven circulation changes threaten conservation of endangered North Atlantic Right Whales. Oceanography32.132:169.

Roberts et al. 2016. Habitat-based cetacean density models for the U.S.Atlantic and Gulf of Mexico. Scientific Reports 6.22615

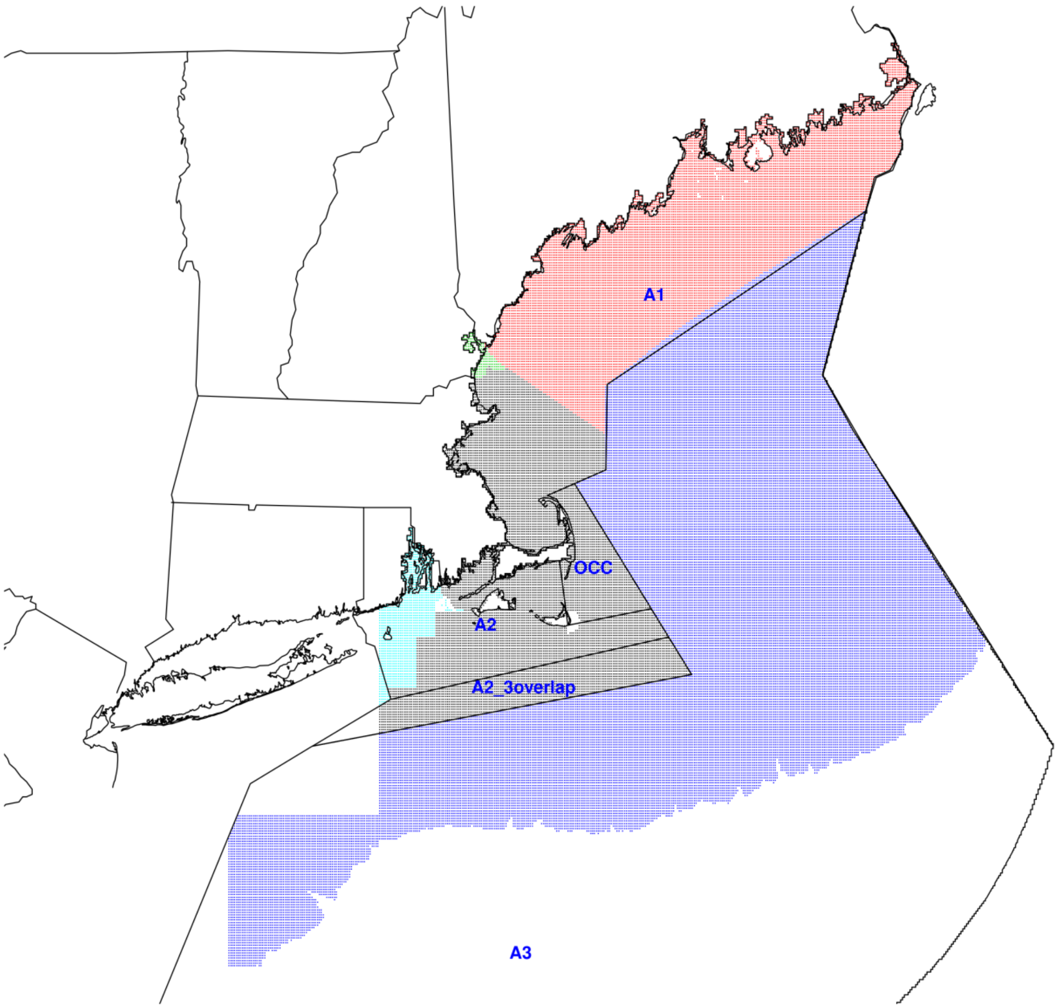

Figure 2.1.a Spatial domain of the Decision Support Tool including the lobster management areas. Colors generally denotes the state where trap densities and traps per trawl data originated with offshore area 3 data coming from the federal government.

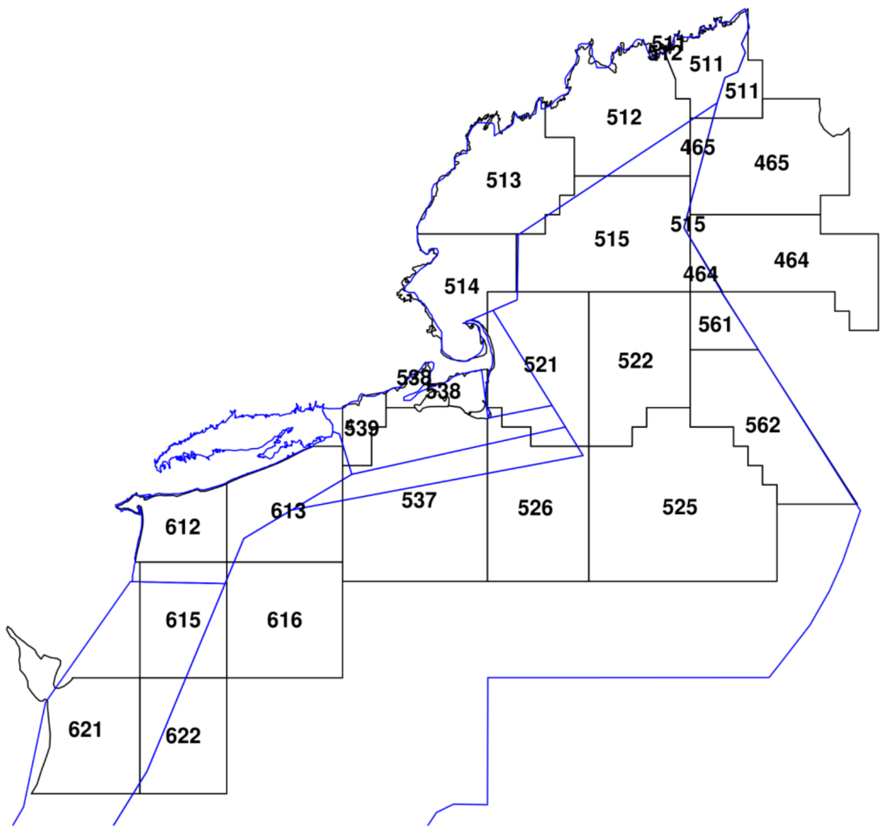

Figure 2.1.b. Reference map for the spatial relation between lobster management areas and NMFS statistical areas.

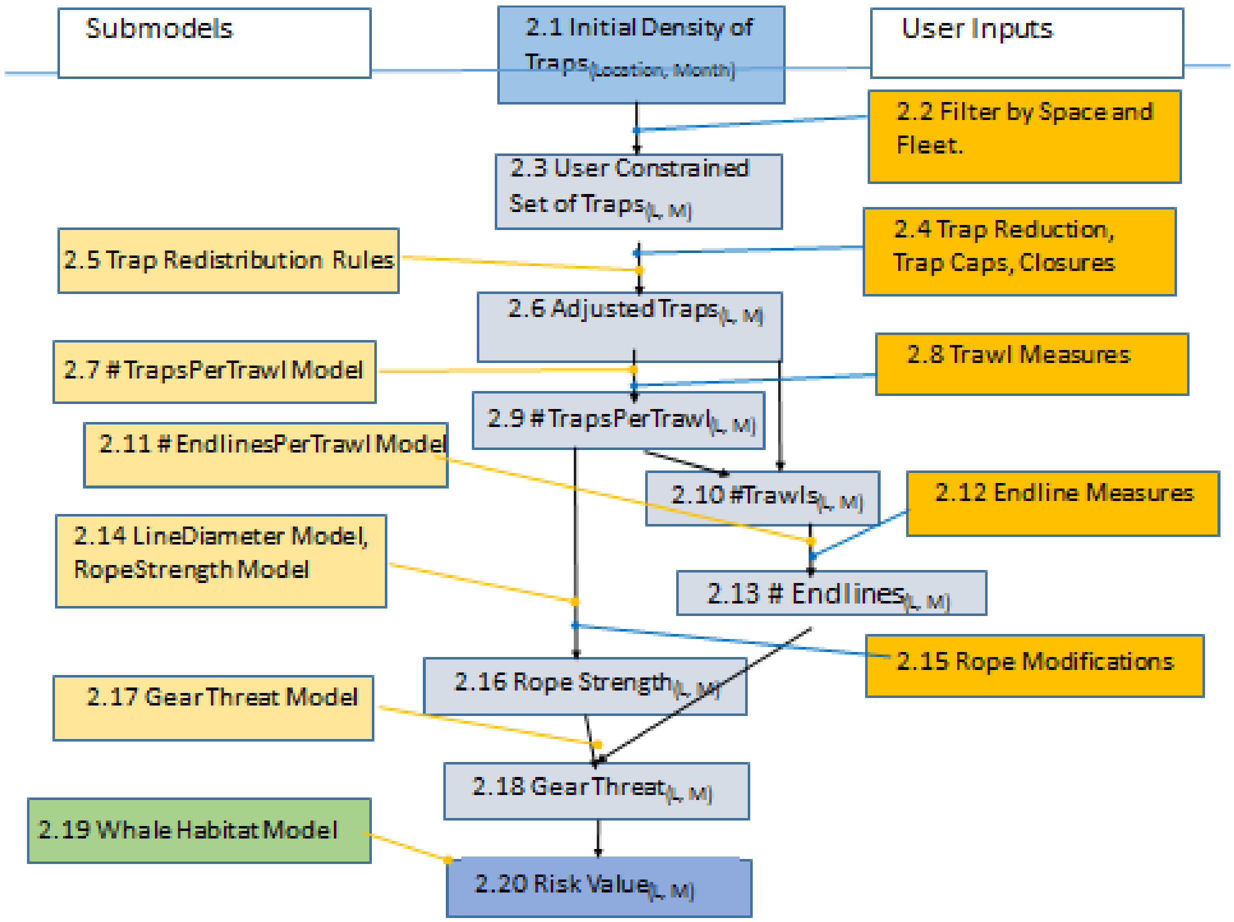

Figure 2.1. Schematic of the flow of information through the Decision Support Tool (center column) with submodels (left column) and user inputs (right column).

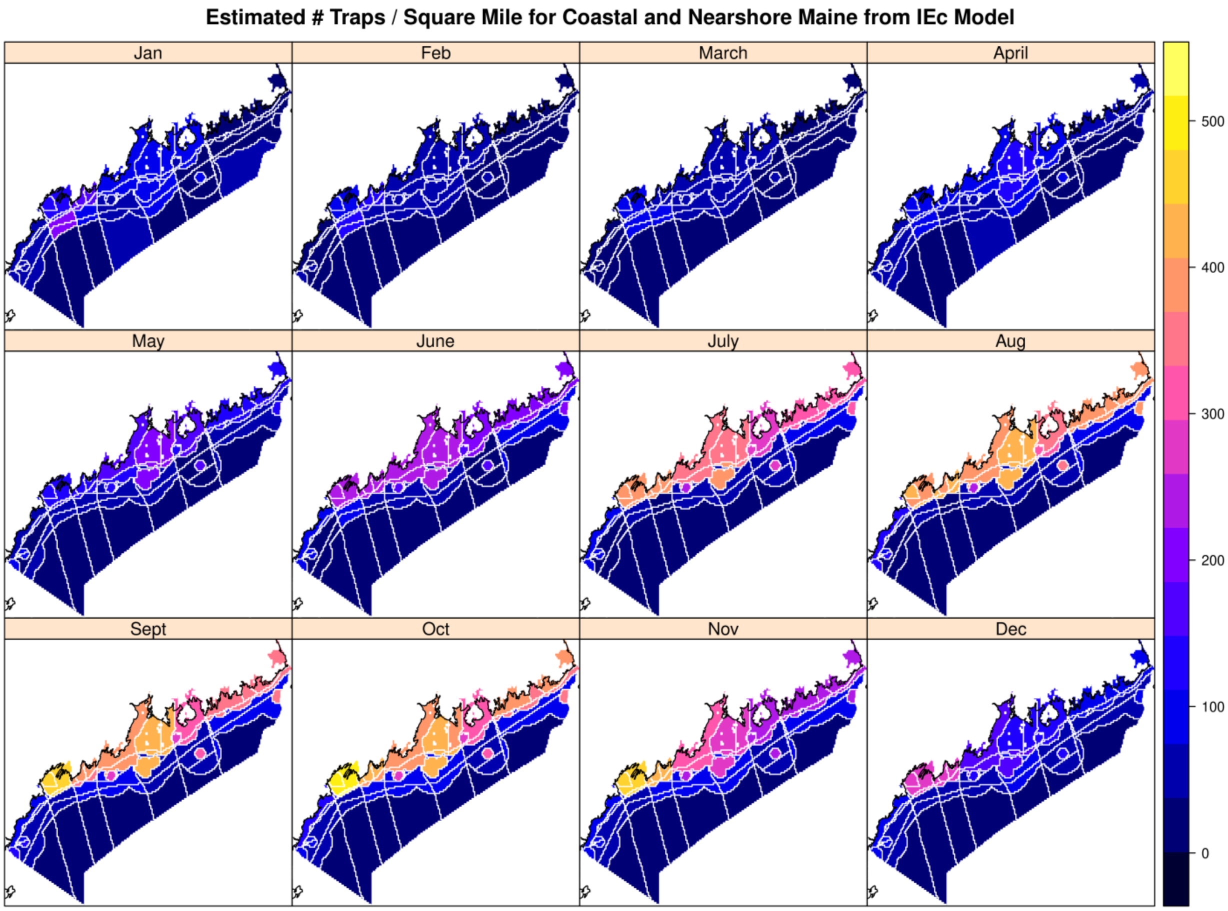

Figure 4.1.1.1.a Default trap densities and delineated regions for waters off Maine.

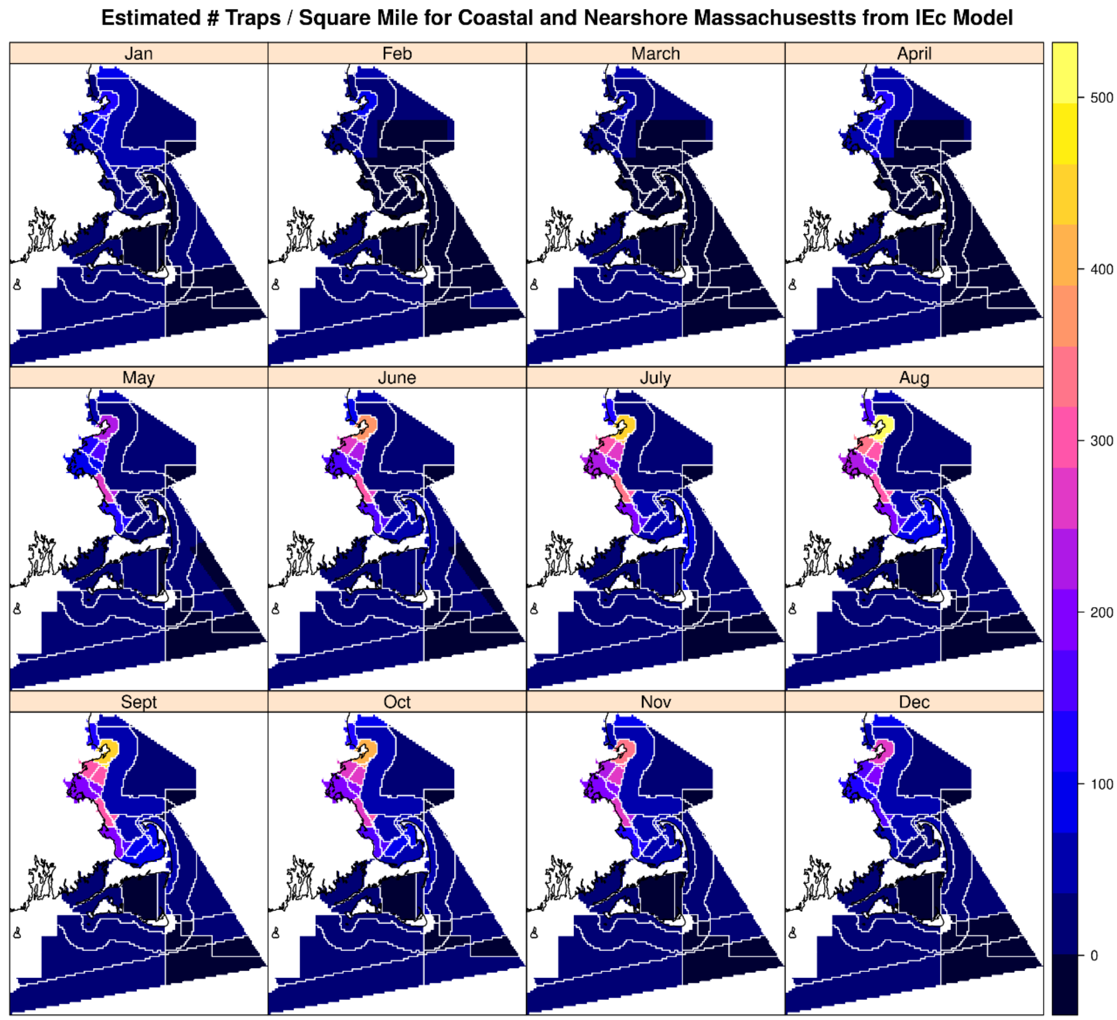

Figure 4.1.1.3.a Default trap densities and delineated regions for waters off Massachusetts.

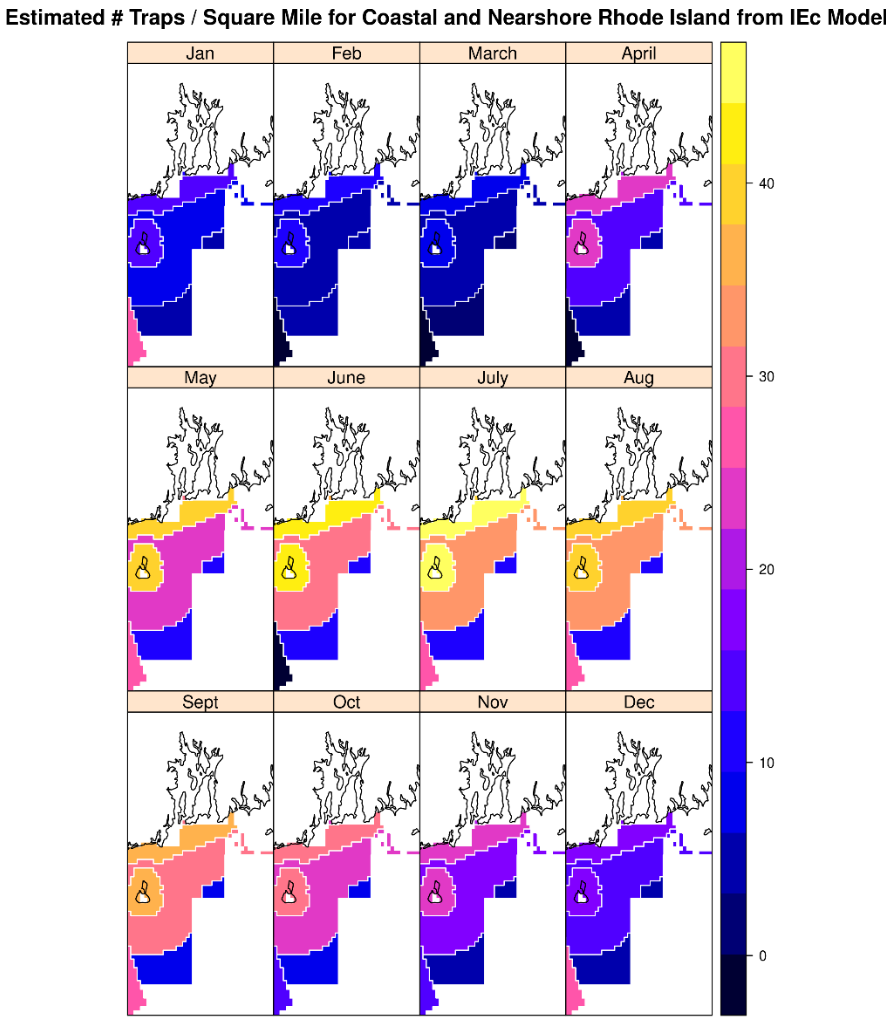

Figure 4.1.1.4.a Default trap densities and delineated regions for waters off Rhode Island.

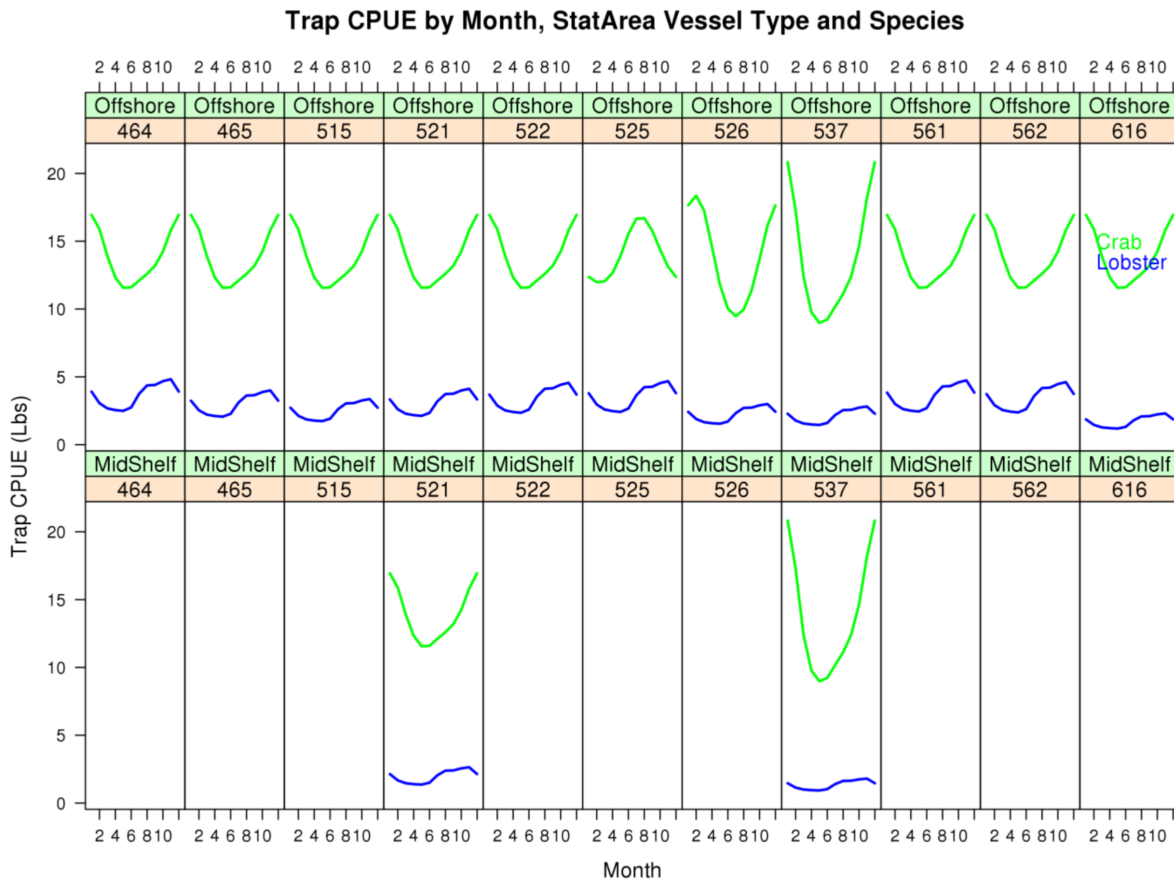

Figure 4.1.2.2.a. Modeled Catch per trap by species, fleet, and statistical area.

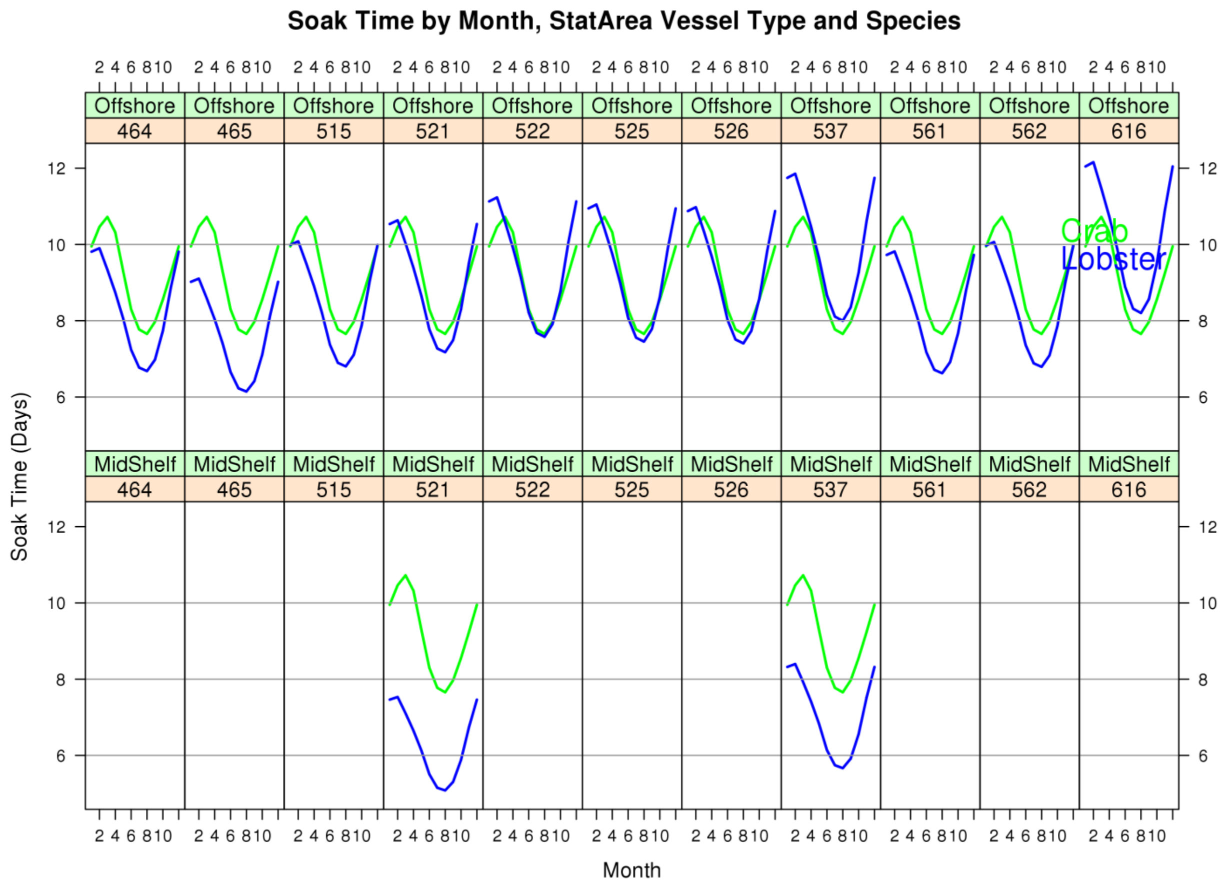

Figure 4.1.2.3.a. Model estimated soak time by species, fleet, statistical area.

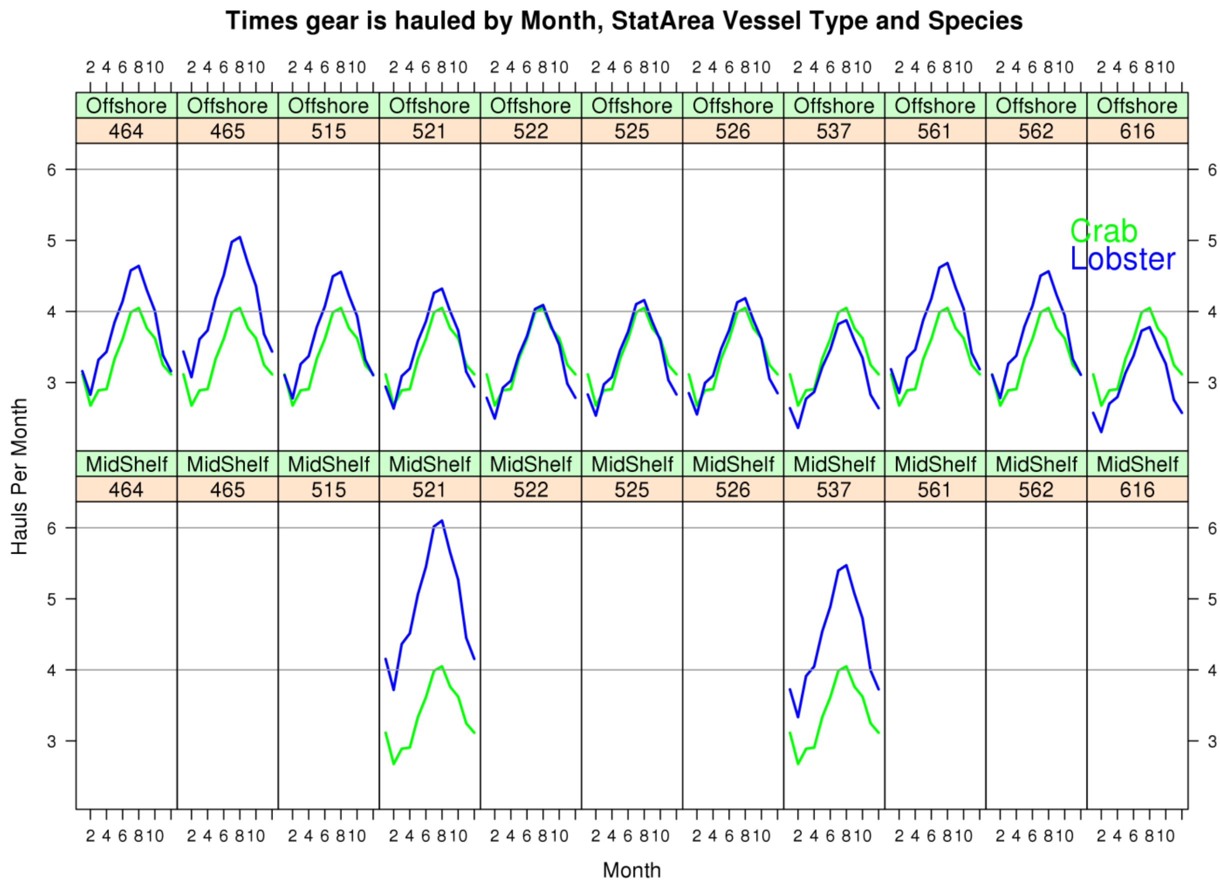

Figure 4.1.2.3.b. Resulting estimated number of times a trawl is hauled per month by species, fleet, and statistical area.

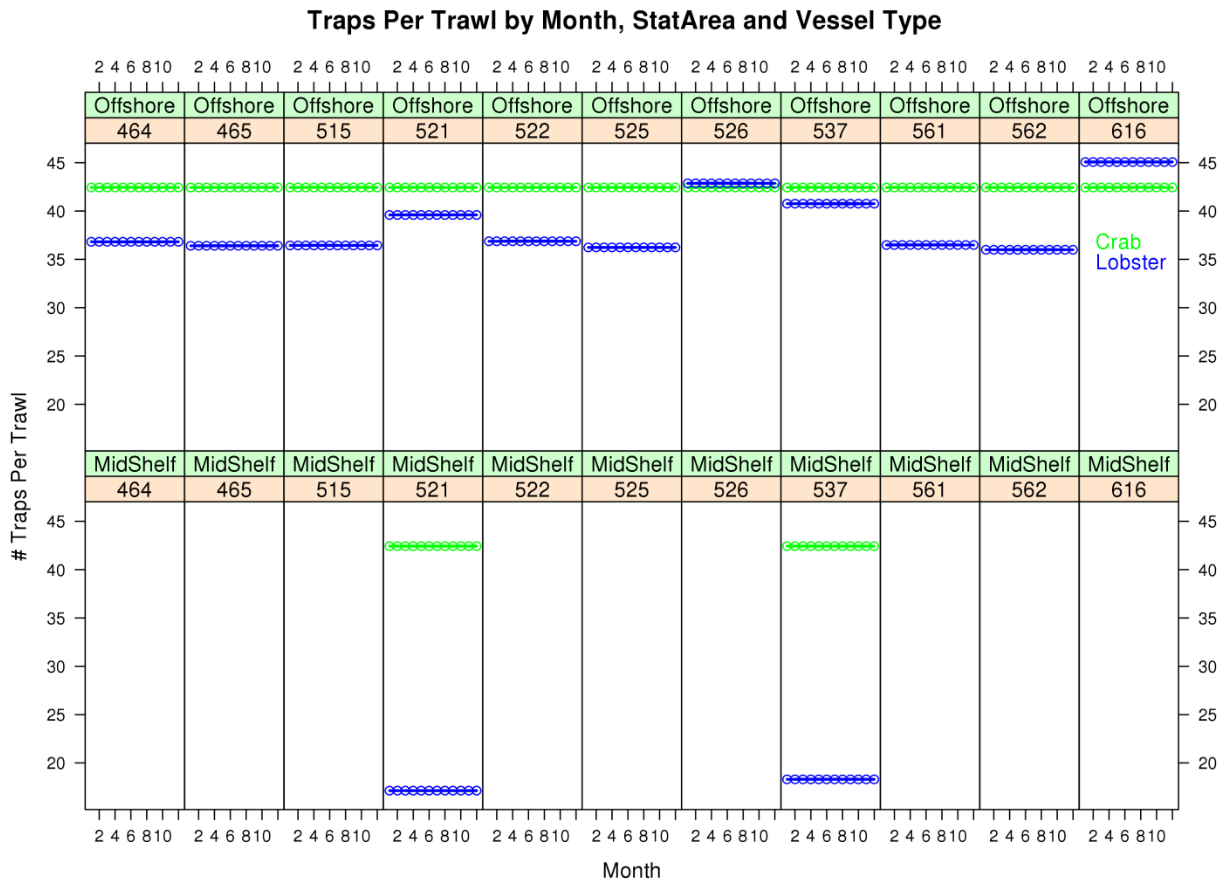

Figure 4.1.2.4.a Estimated number of traps per trawl by statistical area and fleet for the Jonah crab and lobster fishery.

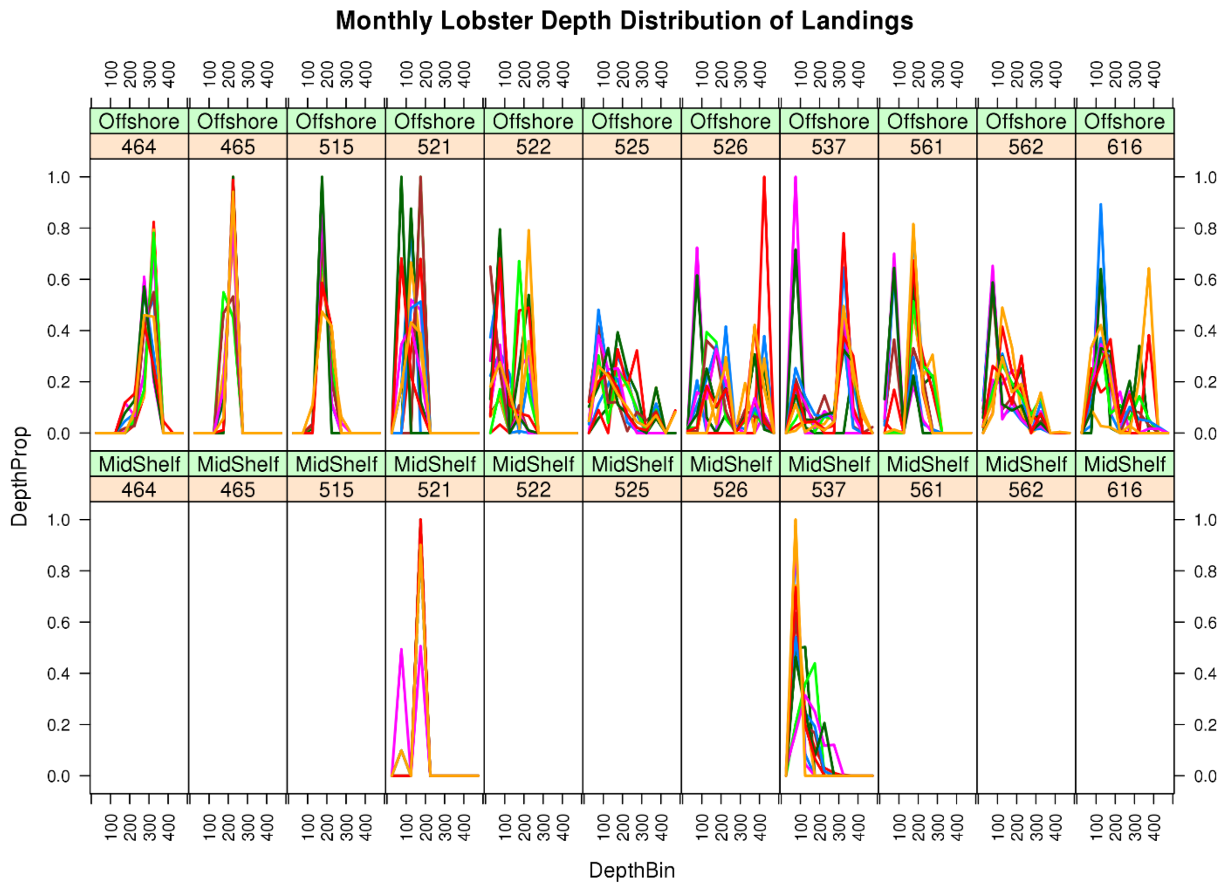

Figure 4.1.2.6.a Proportion of lobster landings by depth bin (meters) within statistical areas and fleets. With individual lines representing different months.

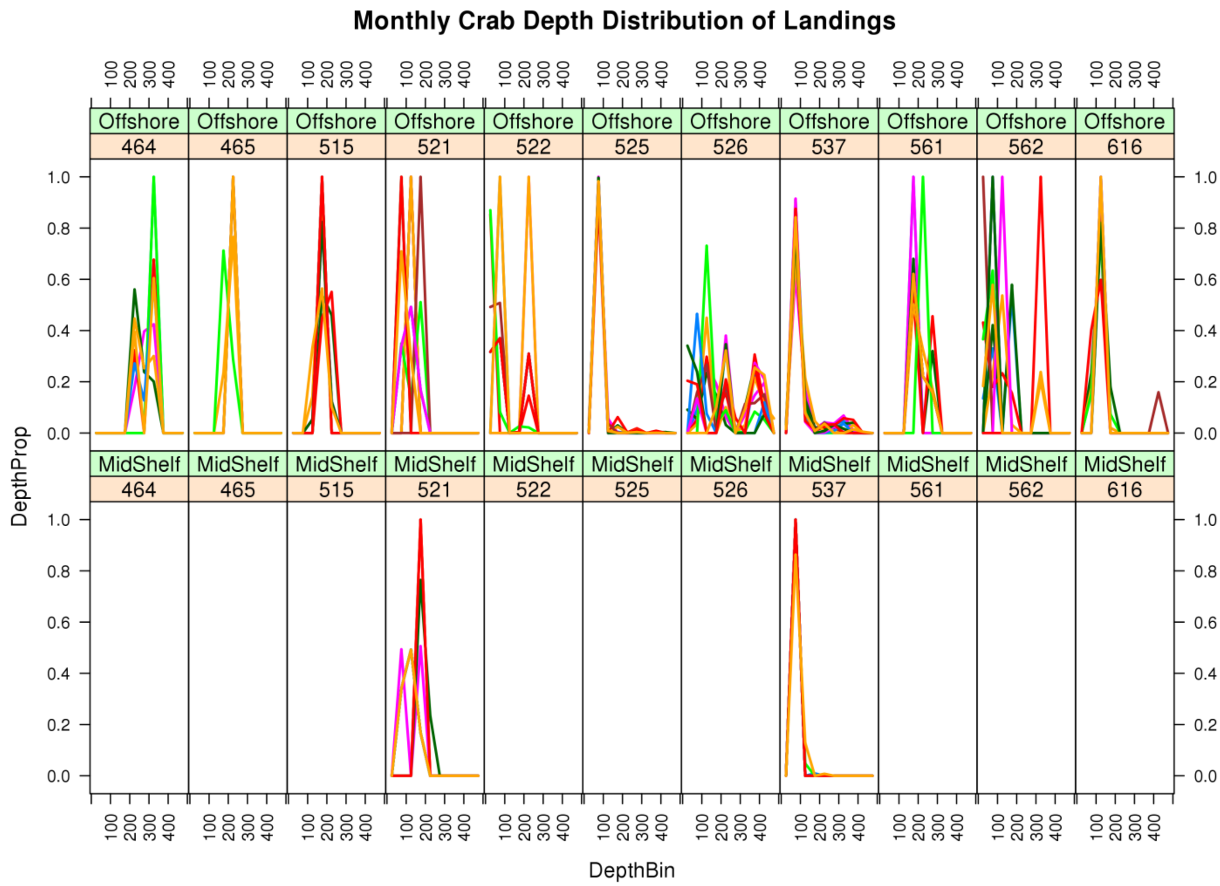

Figure 4.1.2.6.b Proportion of crab landings by depth bin (meters) within statistical areas and fleets. With individual lines representing different months.

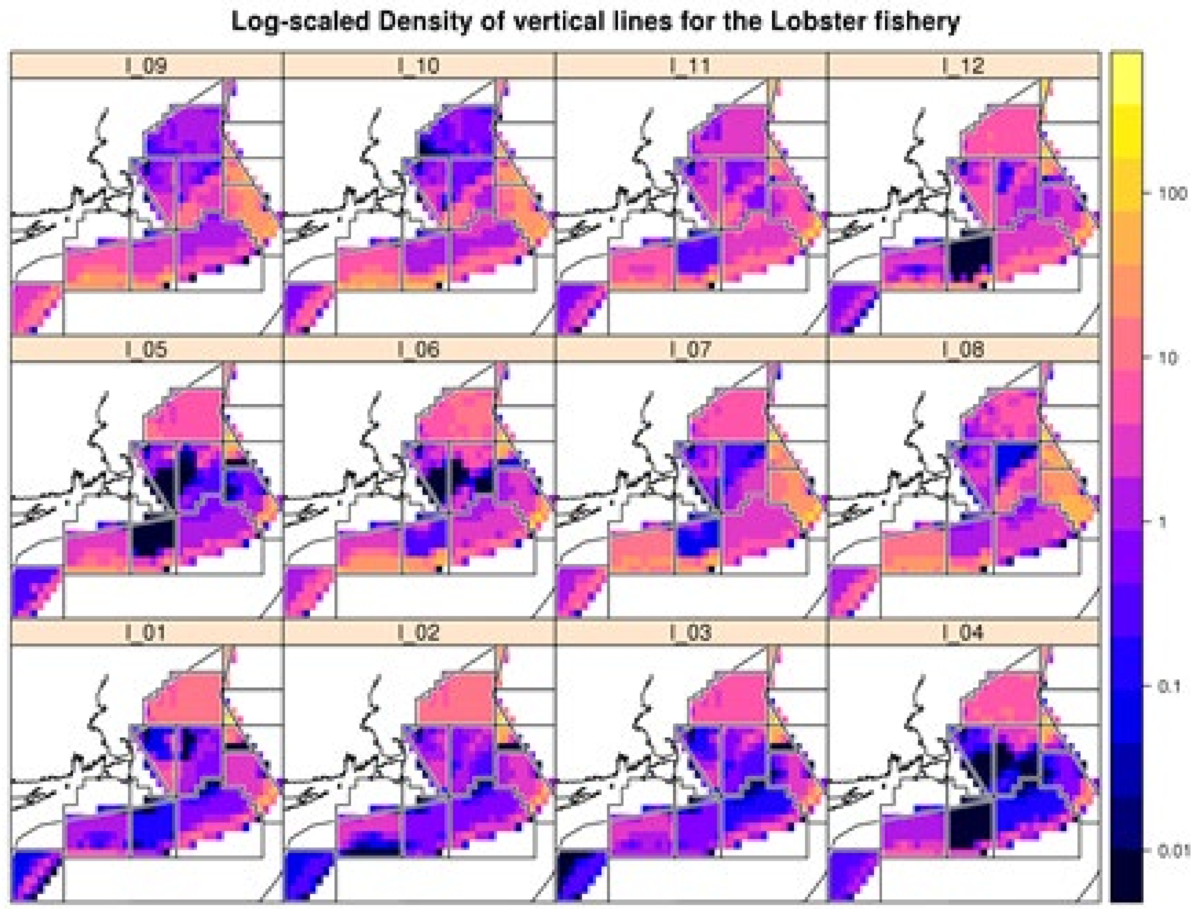

Figure 4.1.2.6.c. Finalized vertical line model for Offshore LMA3 for the lobster fishery.

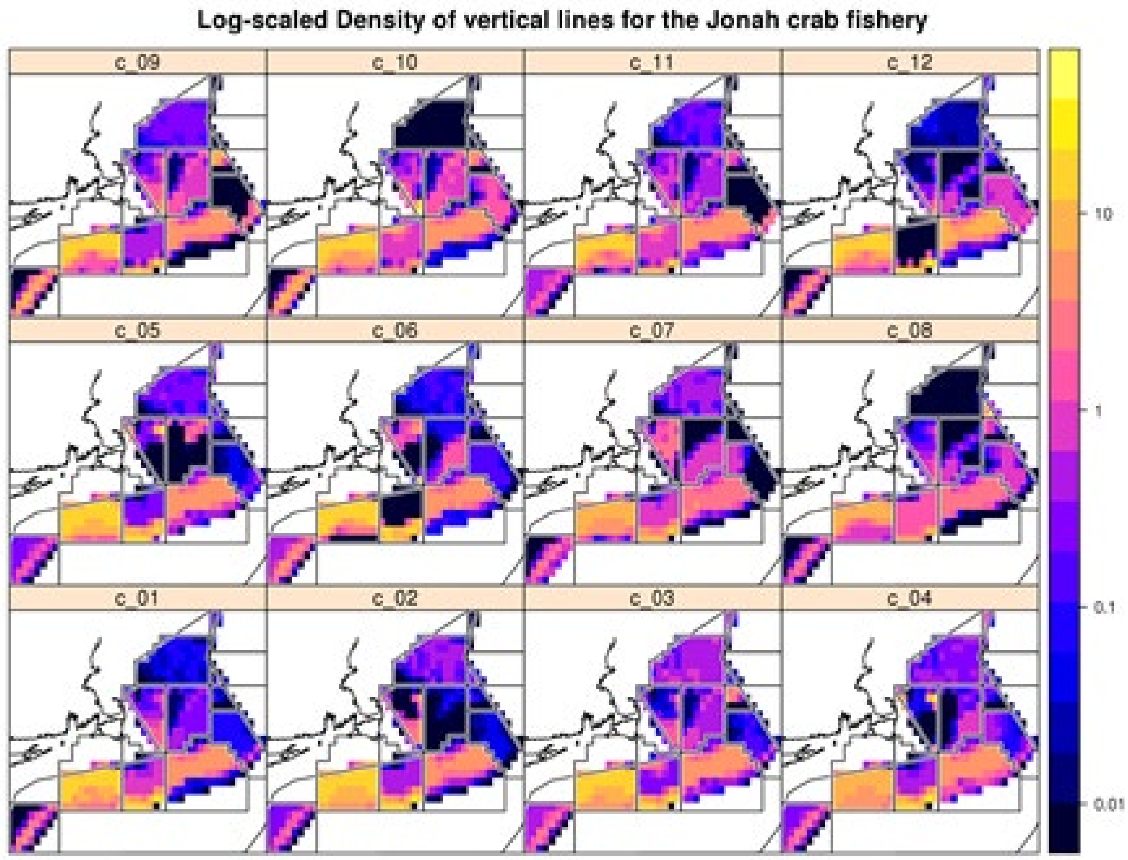

Figure 4.1.2.6.c. Finalized vertical line model for Offshore LMA3 for the Jonah crab fishery.

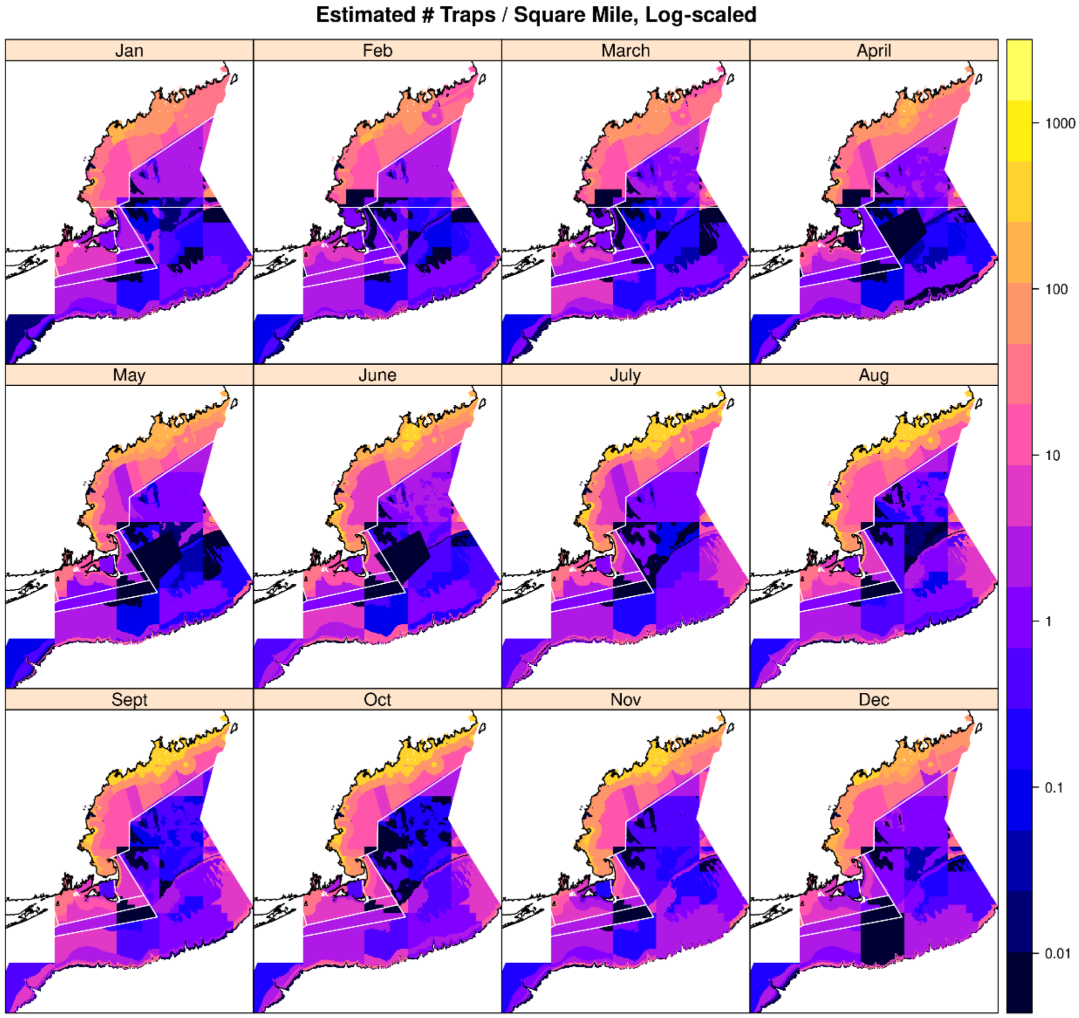

Figure 4.1.3.a. Default TrapMap input to the DST in traps per square mile.

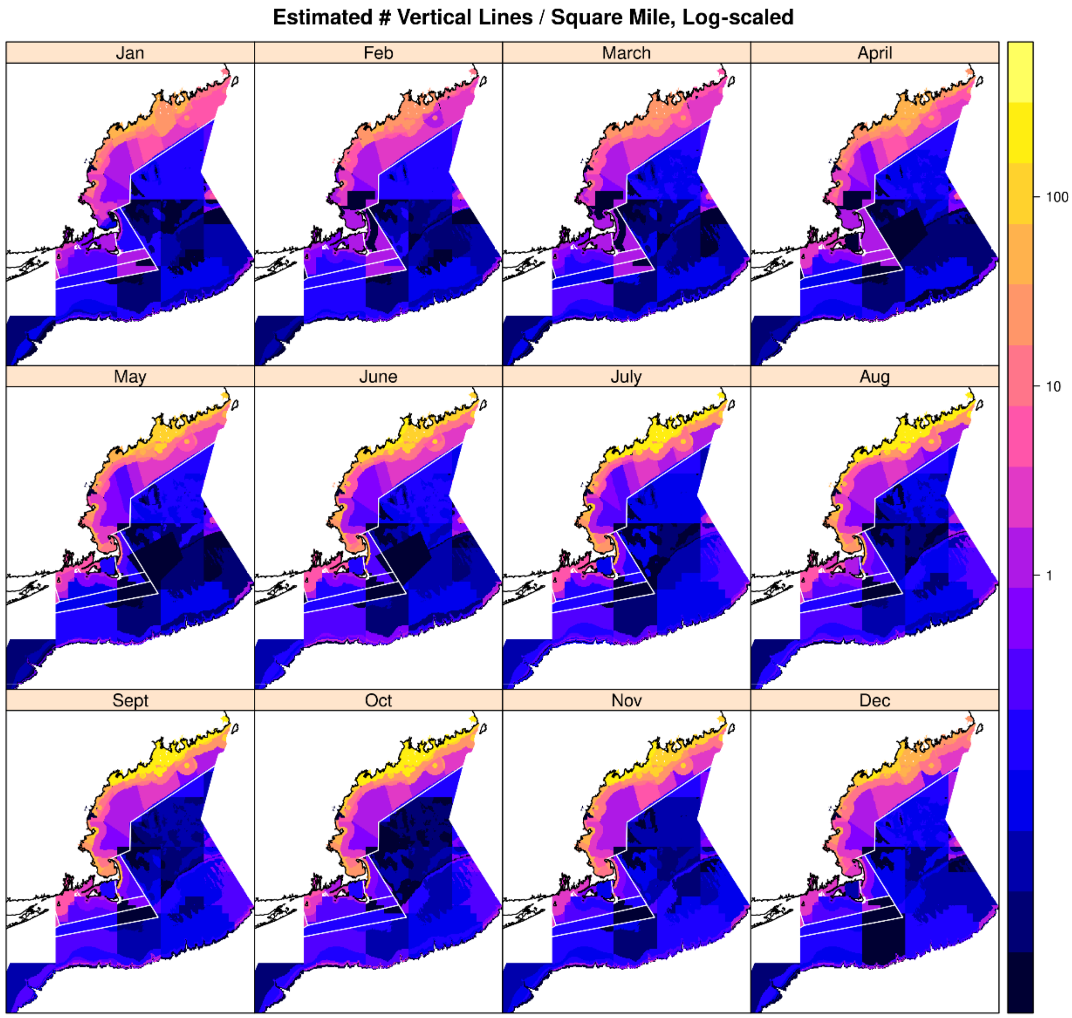

Figure 4.1.3.b. Vertical line densities (lines per square mile) under a default DST model run.

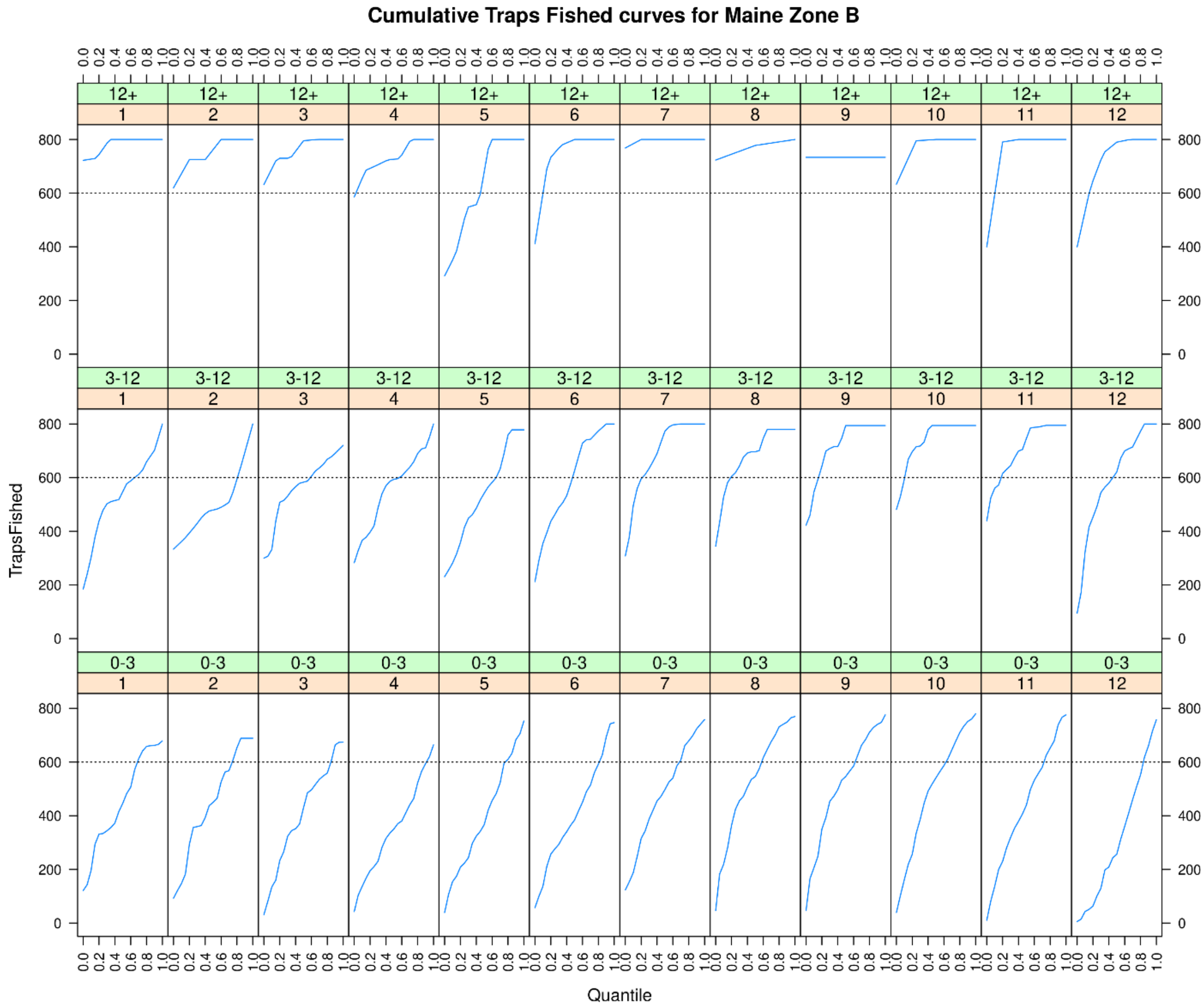

Figure 4.3.2.a. Sample quantile profiles of traps fished for Maine Zone B.

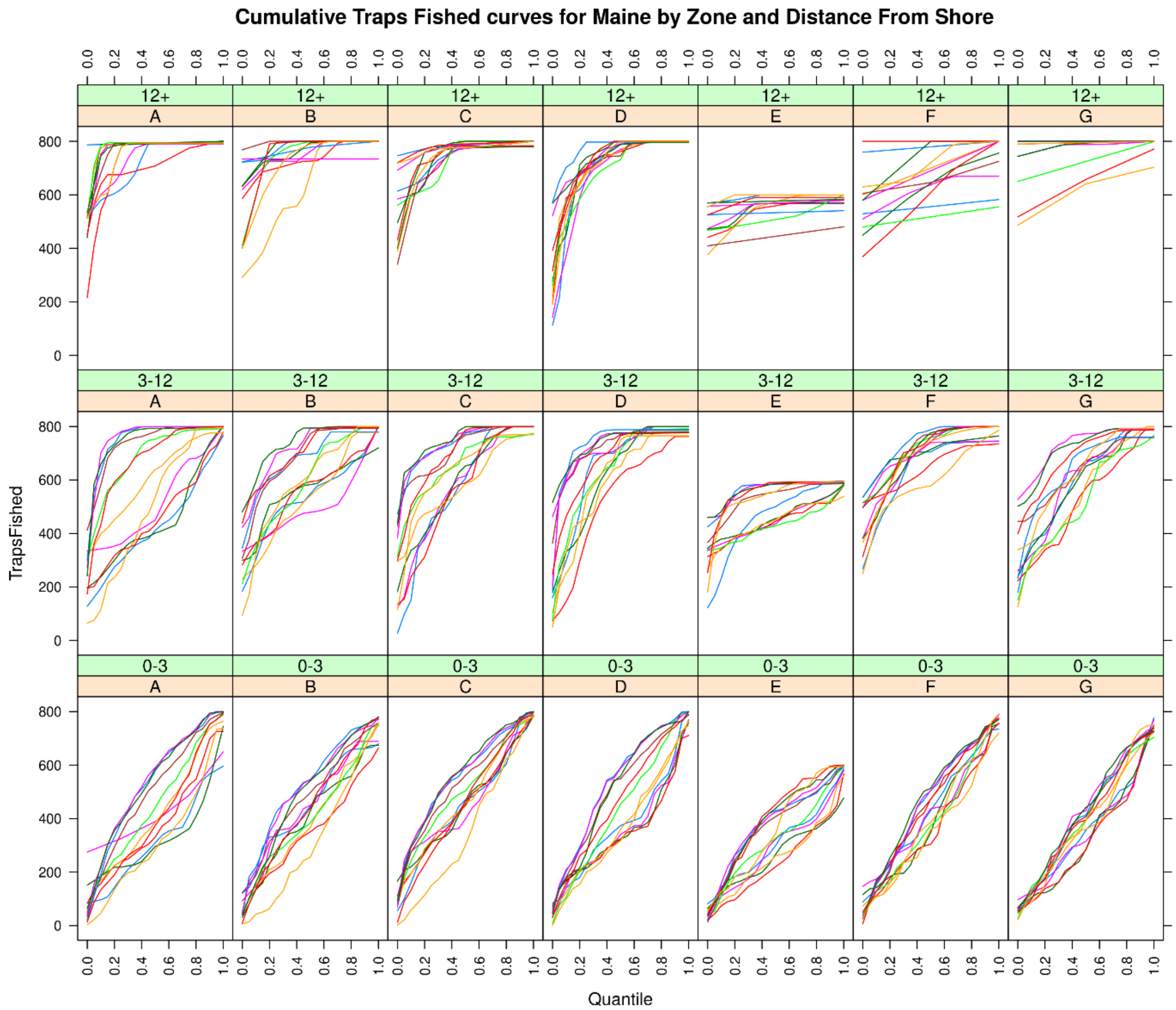

Figure 4.3.2.b Cumulative quantile curves of traps fished in Maine by lobster zone and distance from shore. Individual lines within each panel represent individual months.

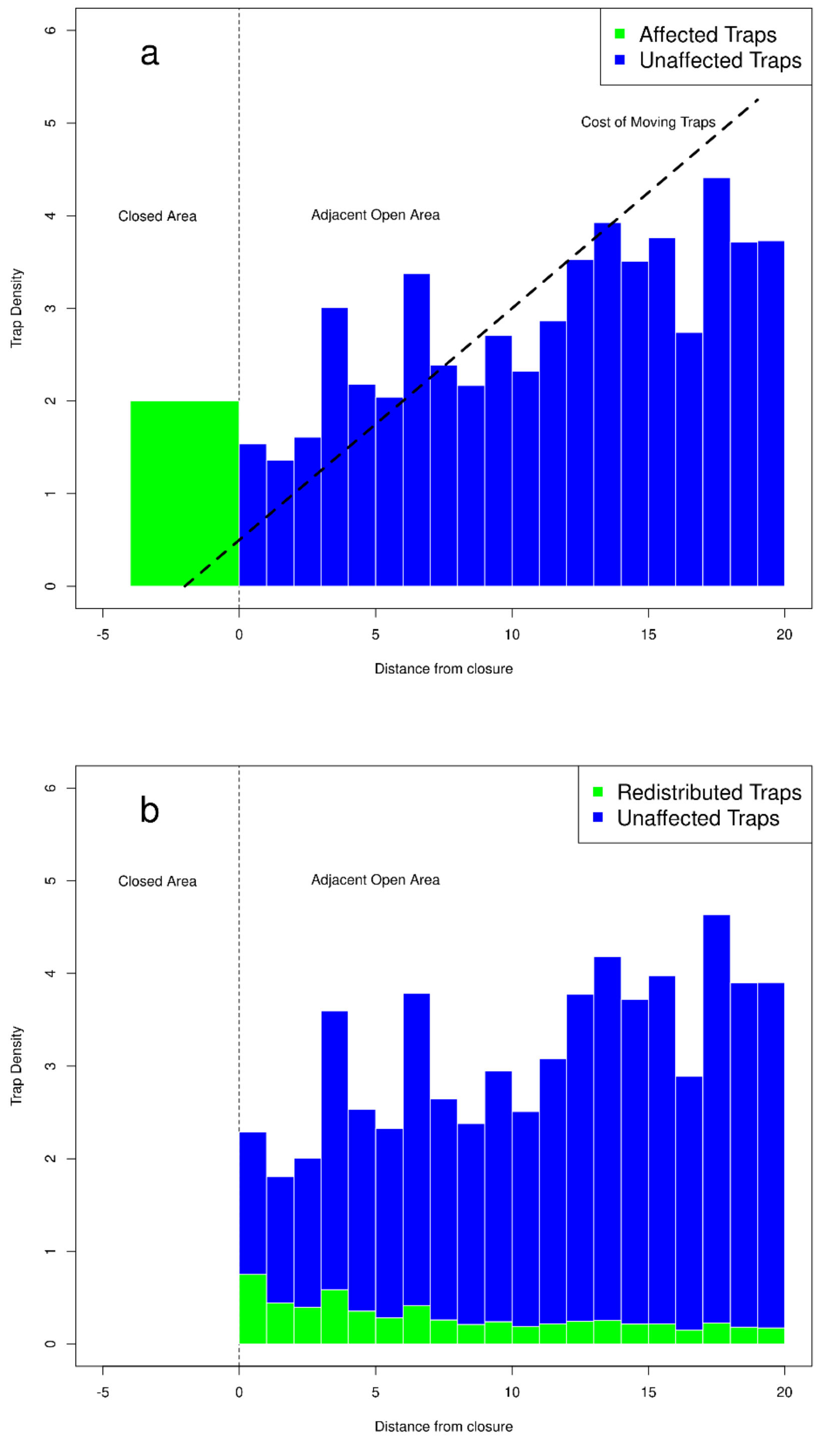

Figure 4.3.3.a. Illustration of the process of redistributing traps given a closure. (a) shows the traps inside the closure to be moved, the density of traps outside the closure, and the linear cost function of moving traps to greater distances. (b) shows the redistributed traps as a function of the density of adjacent traps and cost of redistribution.

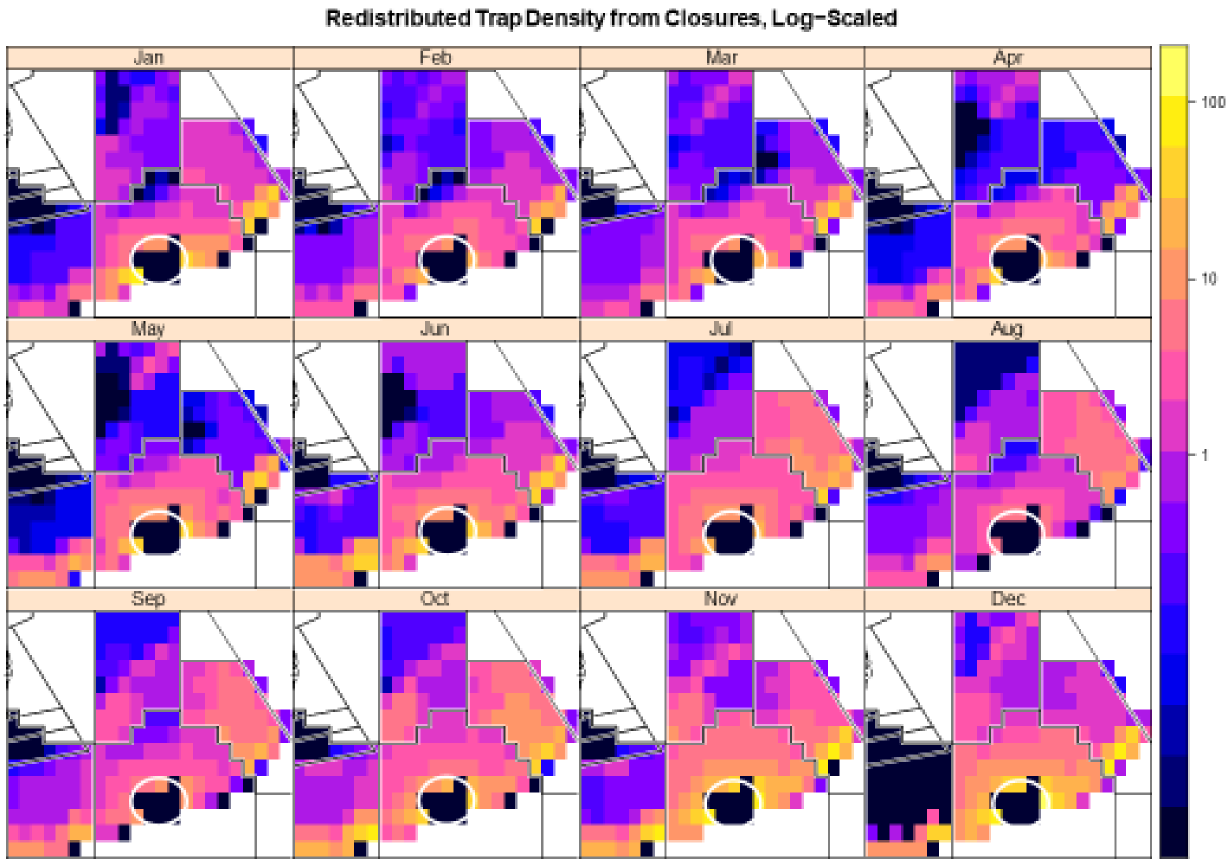

Figure 4.3.3.b. Example of trap redistribution model given the closure of the Canyons and Seamounts National Monument (white circle).

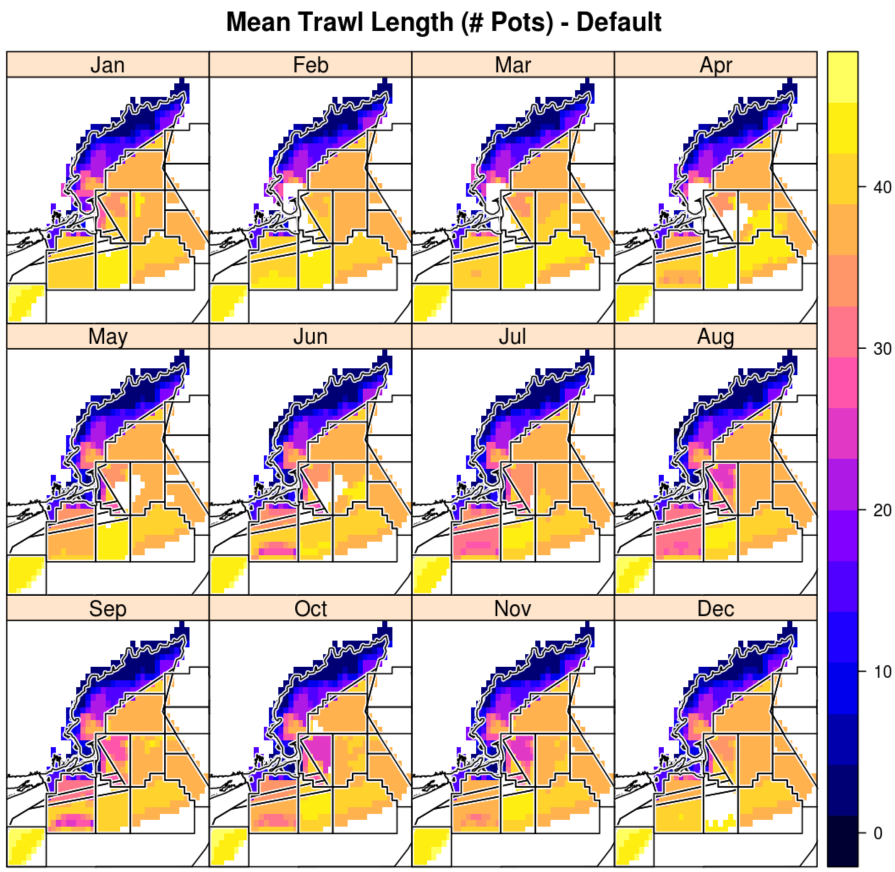

Figure 4.4.a. Mean trawl length (number of traps per trawl) for a default model run.

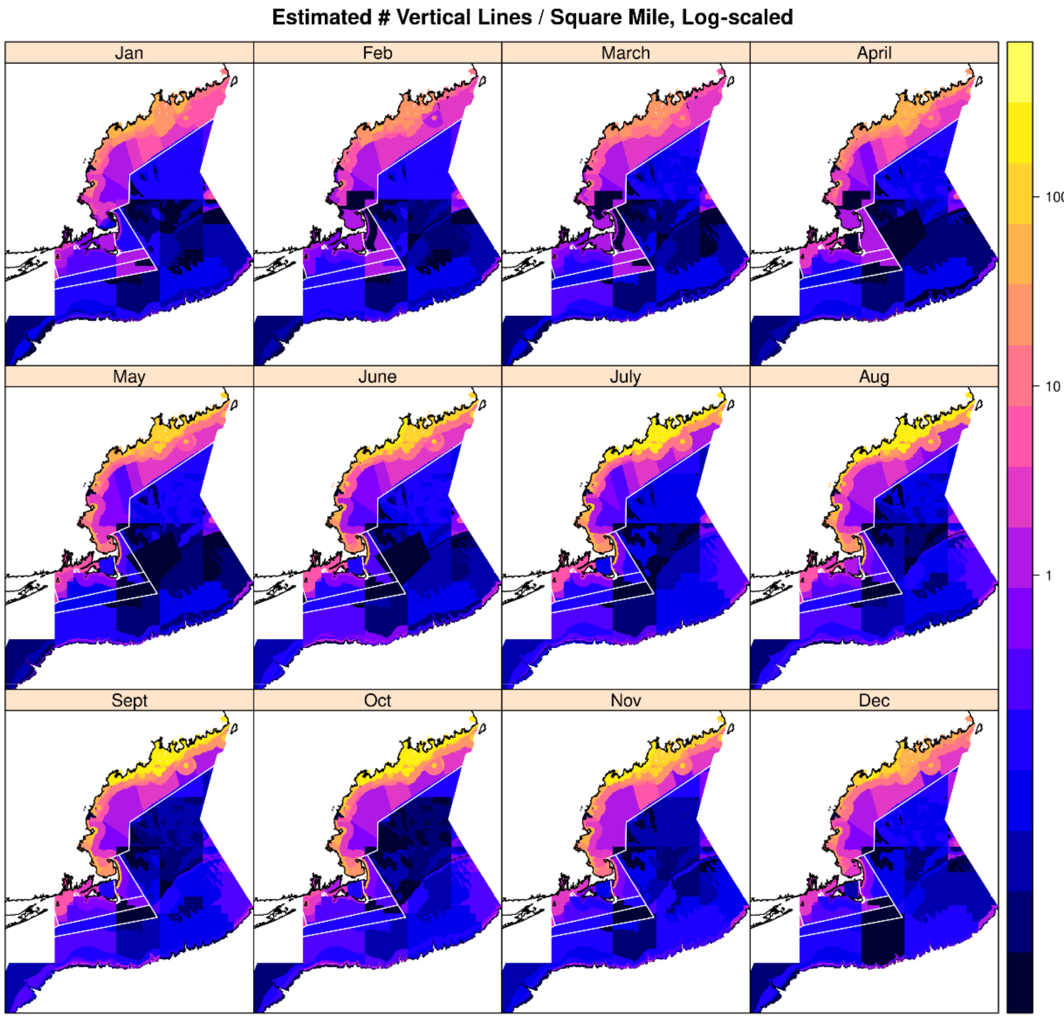

Figure 4.5.a. Number of endlines per square mile (log-scaled) for a default model run.

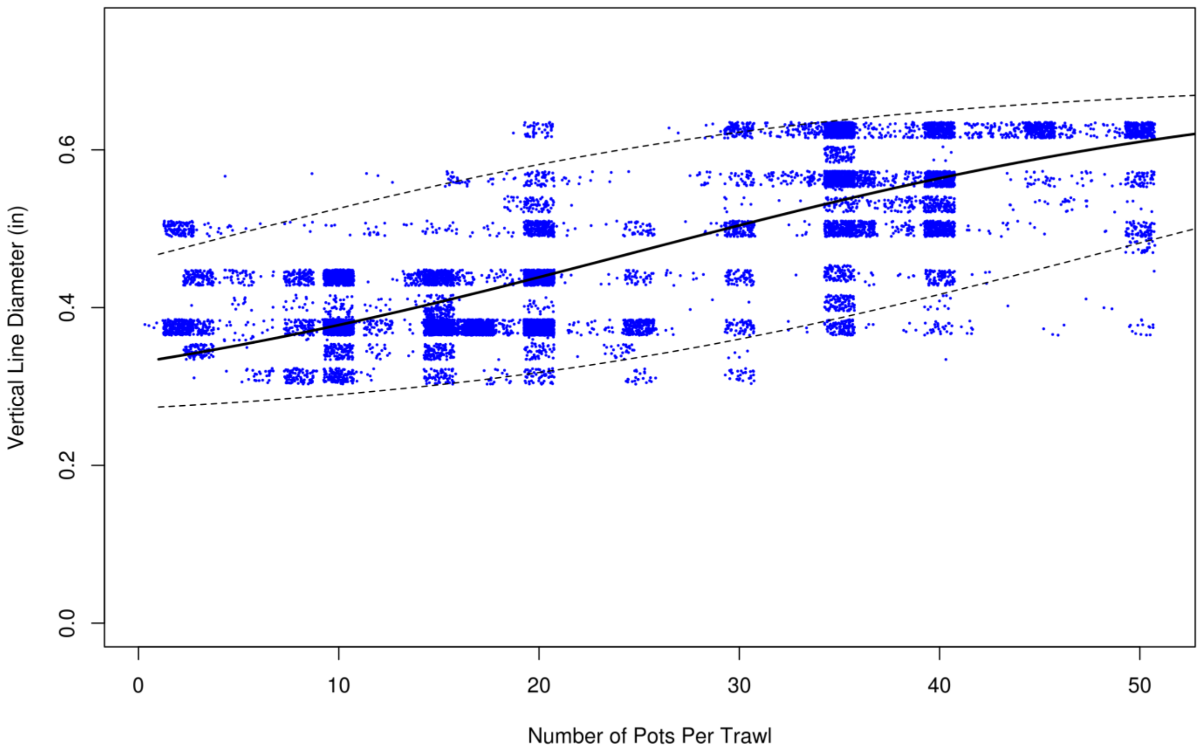

Figure 4.6.1.a Observed relationship between trawl length and vertical line diameter from observer data. Data points are ‘jittered’ to show density of data for discrete data intervals. Overlayed trendlines are the results of a logistic regression fitted to the data + / - 2sd.

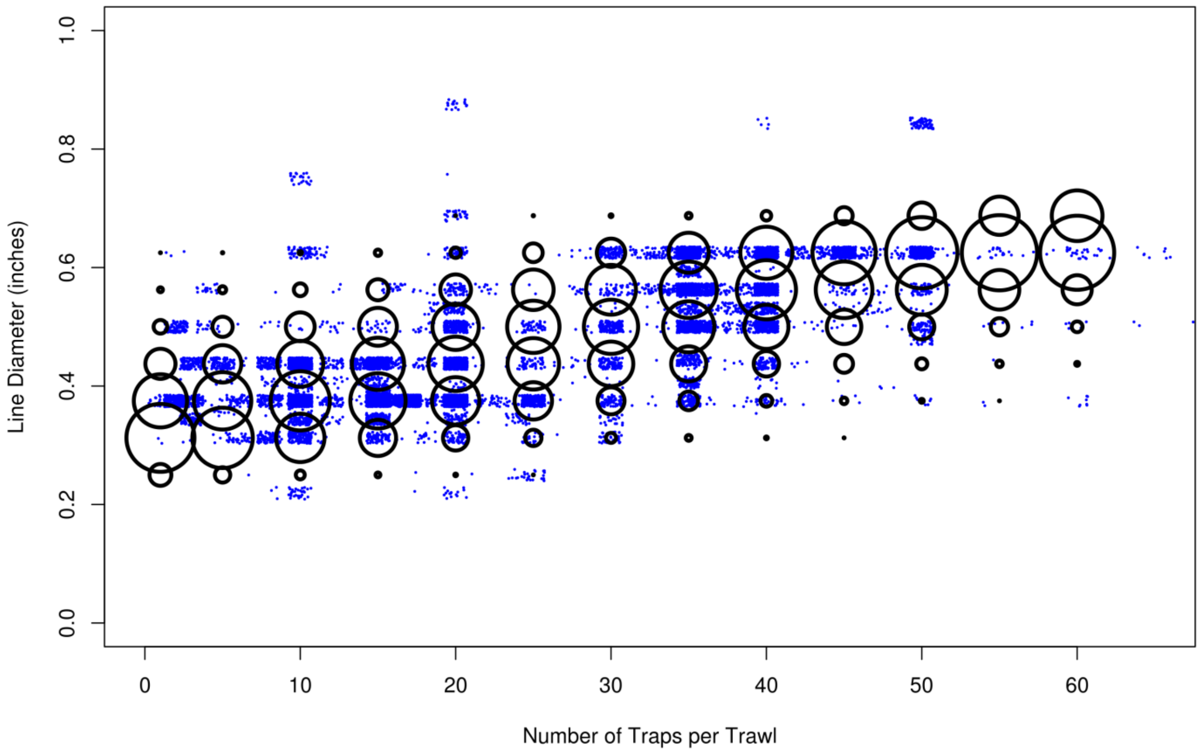

Figure 4.6.1.b. Observed (blue dots) and predicted (bubbles) relationship between trawl length and vertical line diameter.

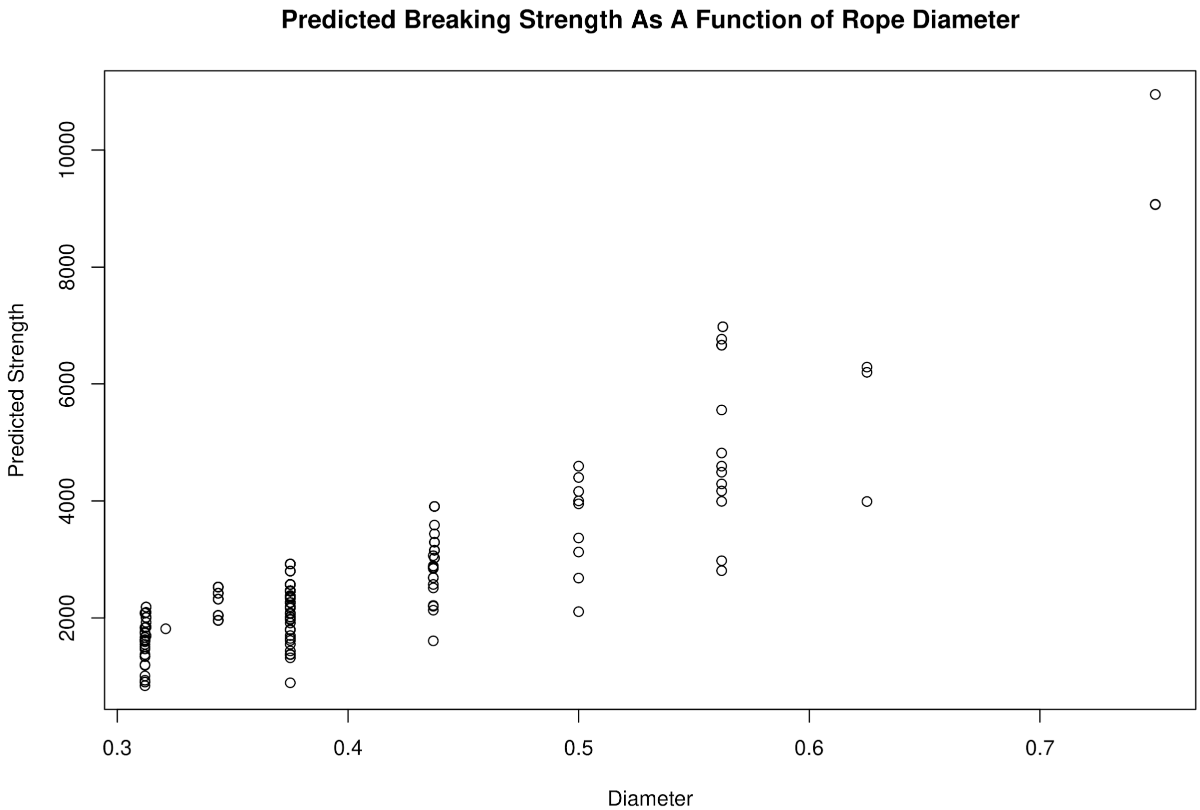

Figure 4.6.2.a. Relationship between rope diameter (inches) and observed breaking strength. Includes data for rope sections with splices and knots.

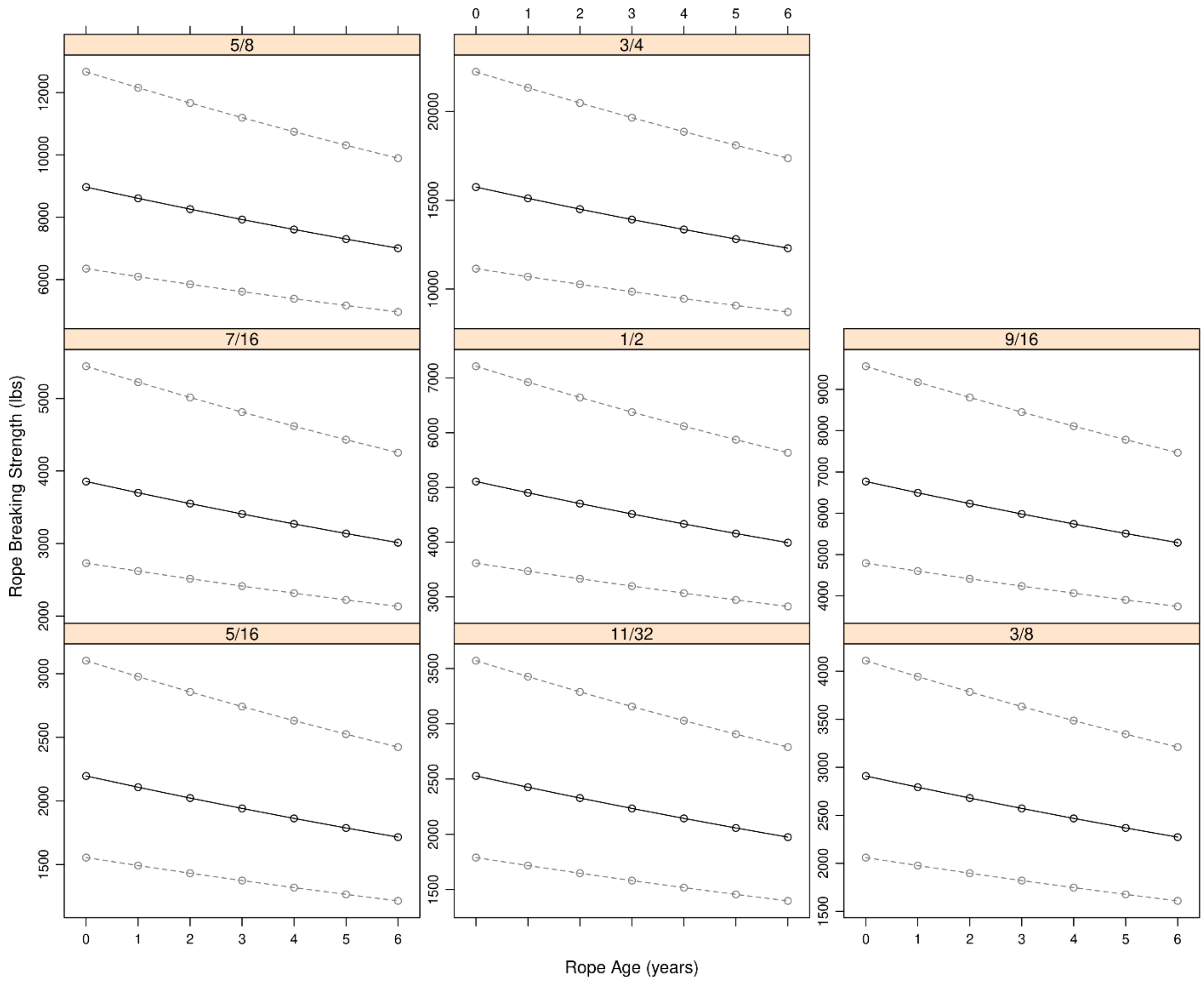

Figure 4.6.2.b. Predicted rope breaking strength (+ / - 2sd) and decreases with age from the combined rope strength data set.

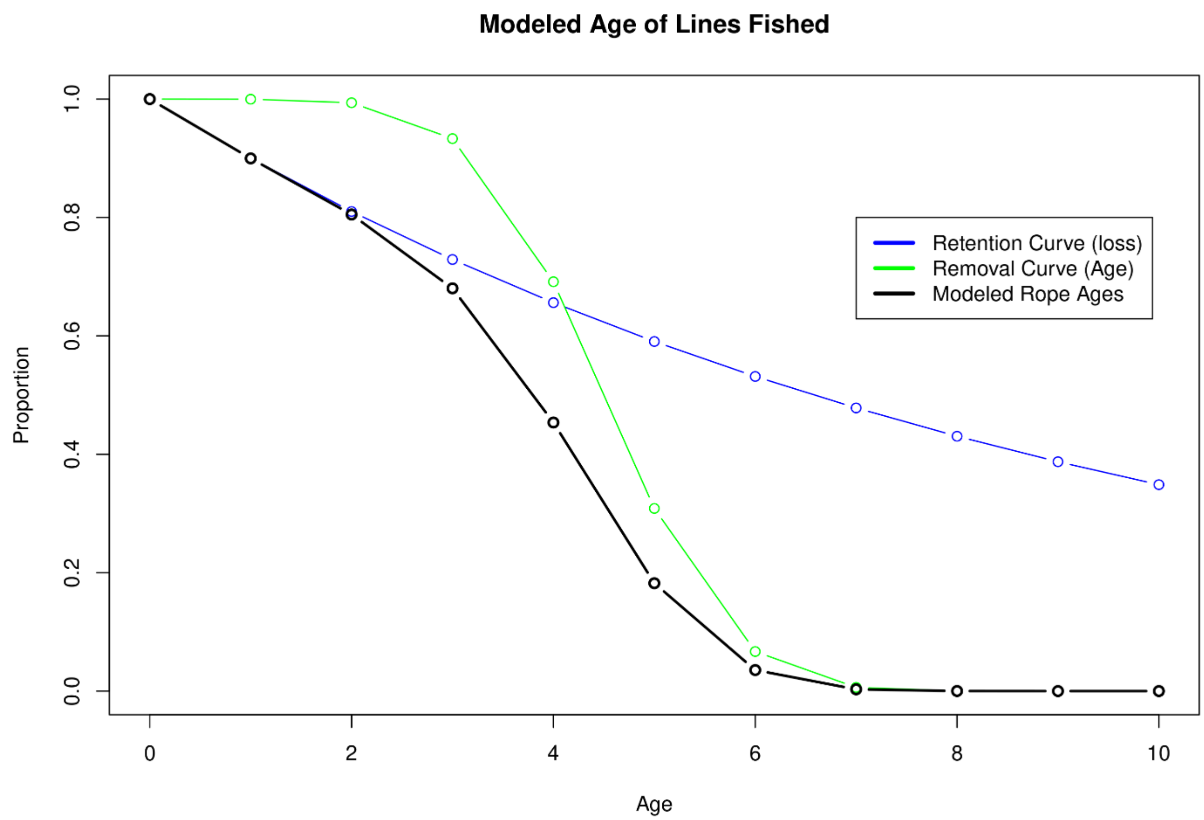

Figure 4.6.2.c. Modeled age of ropes in the active fishery as a function of random loss rates and active removal rates due to wear.

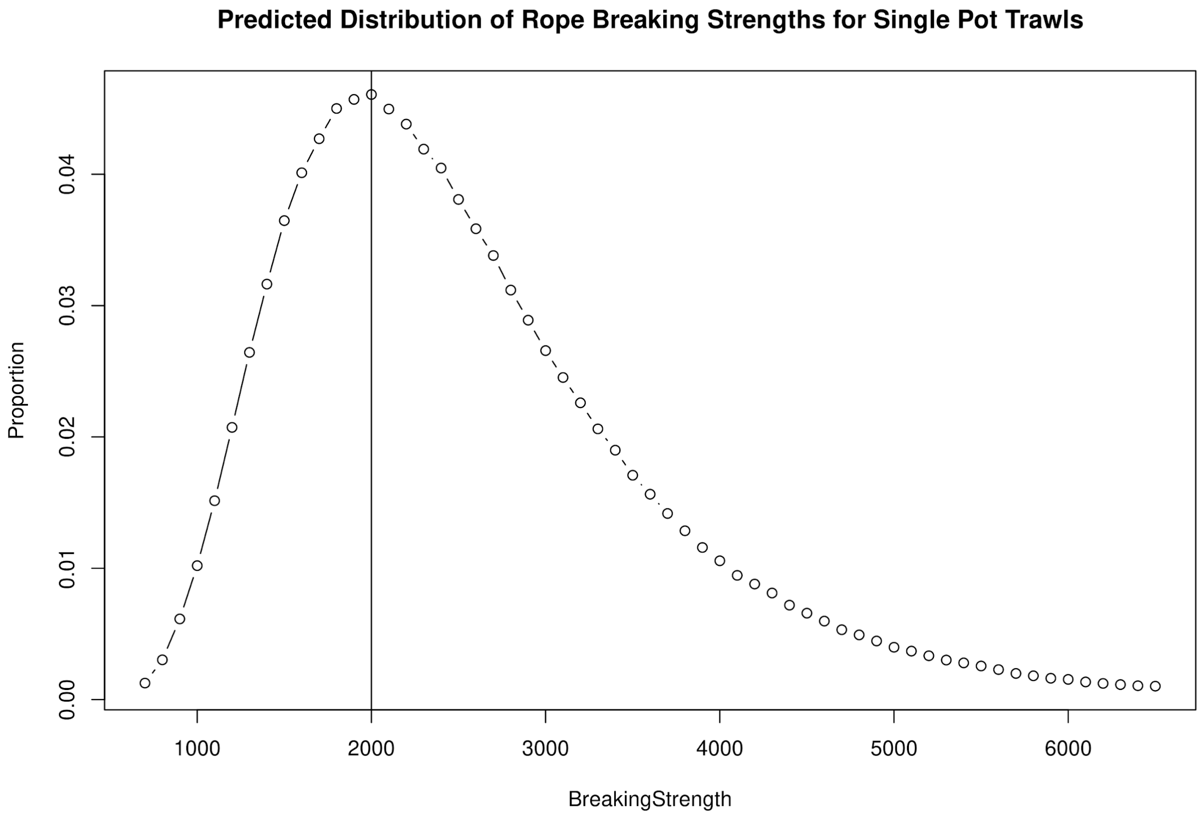

Figure 4.6.3.a. Example predicted distribution of breaking strength for endlines on single pot trawls

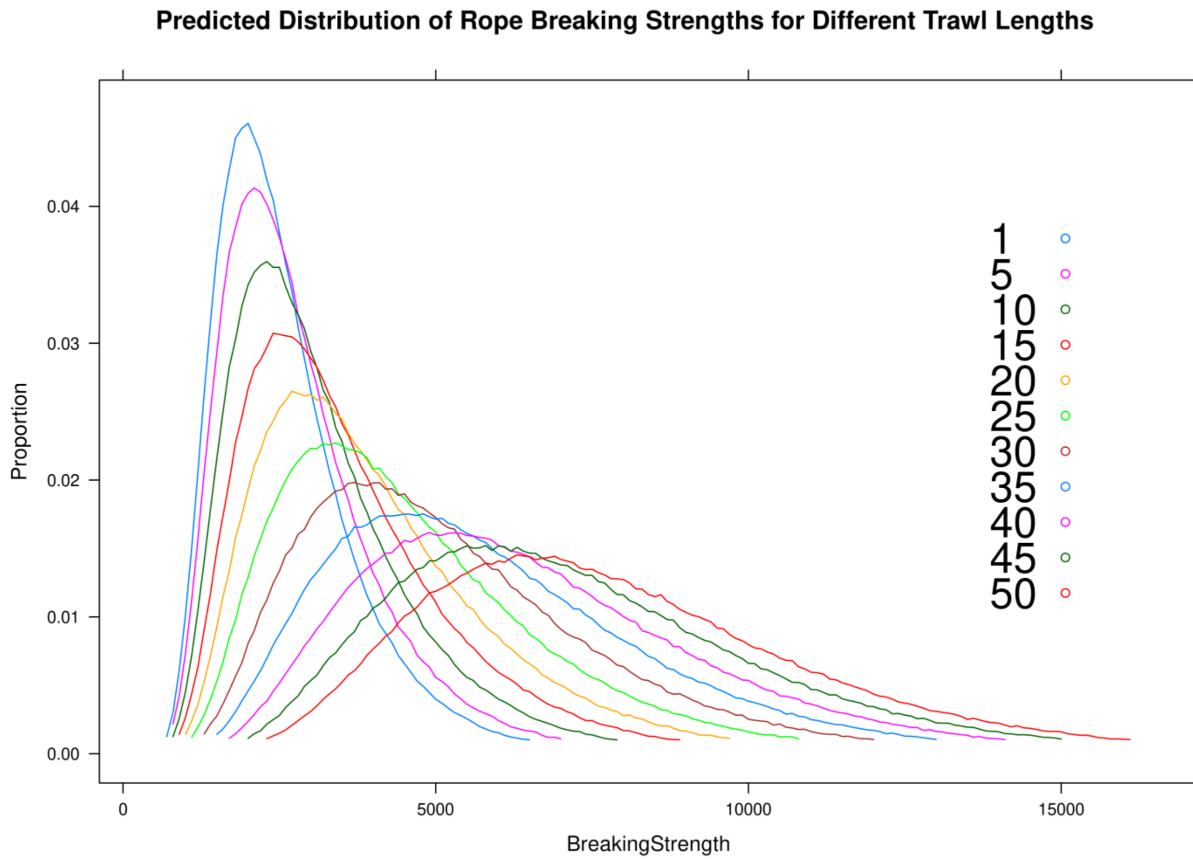

Figure 4.6.3b. Distributions of rope breaking strength for trawl lengths up to 50 pot trawls.

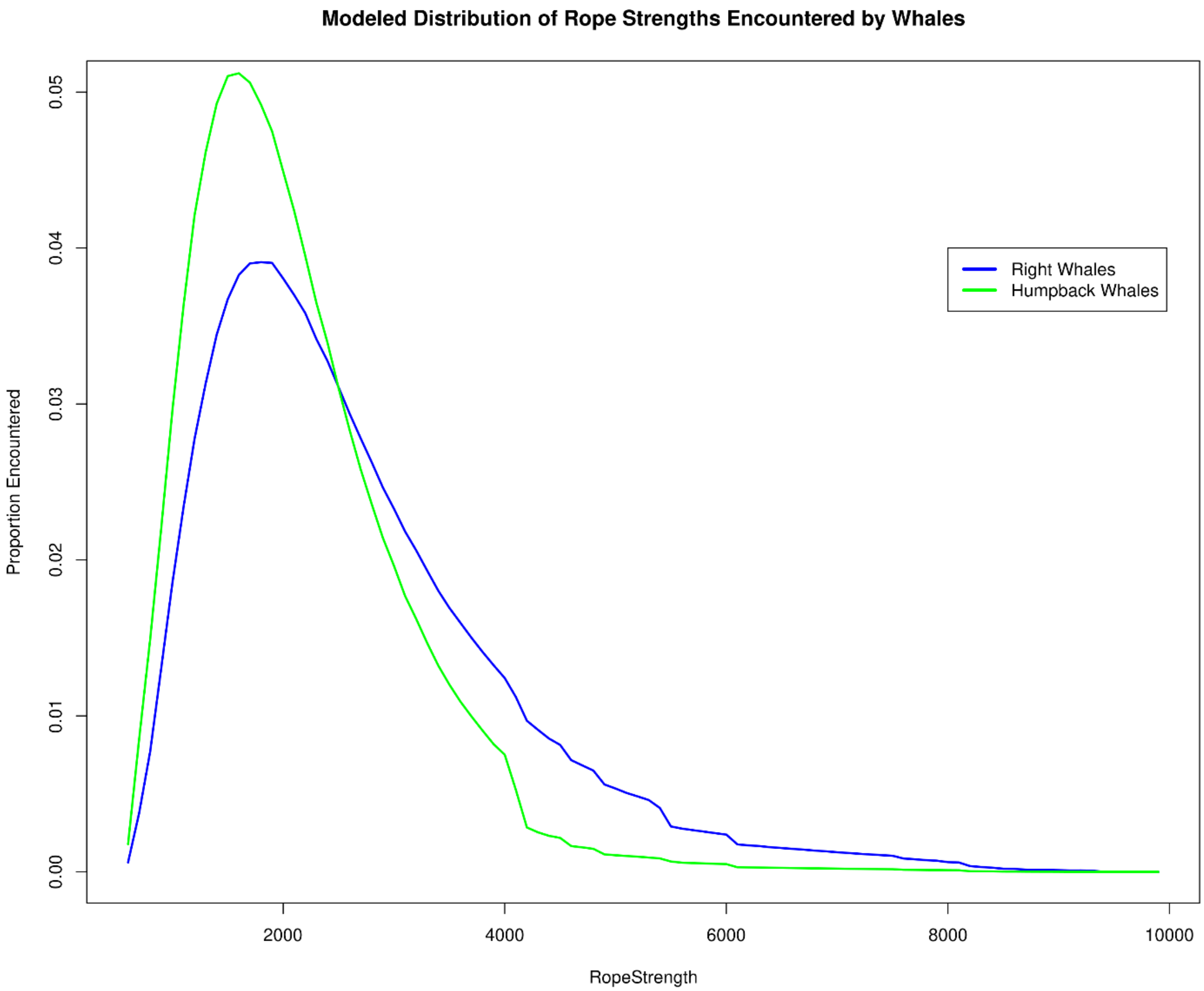

Figure 4.7.2.1.a Distribution of endline strengths whales would be expected to encounter, based on overlap of gear distributions and whale habitat models.

Figure 4.7.2.1.b Expected and observed distribution of rope strengths for Right Whales.

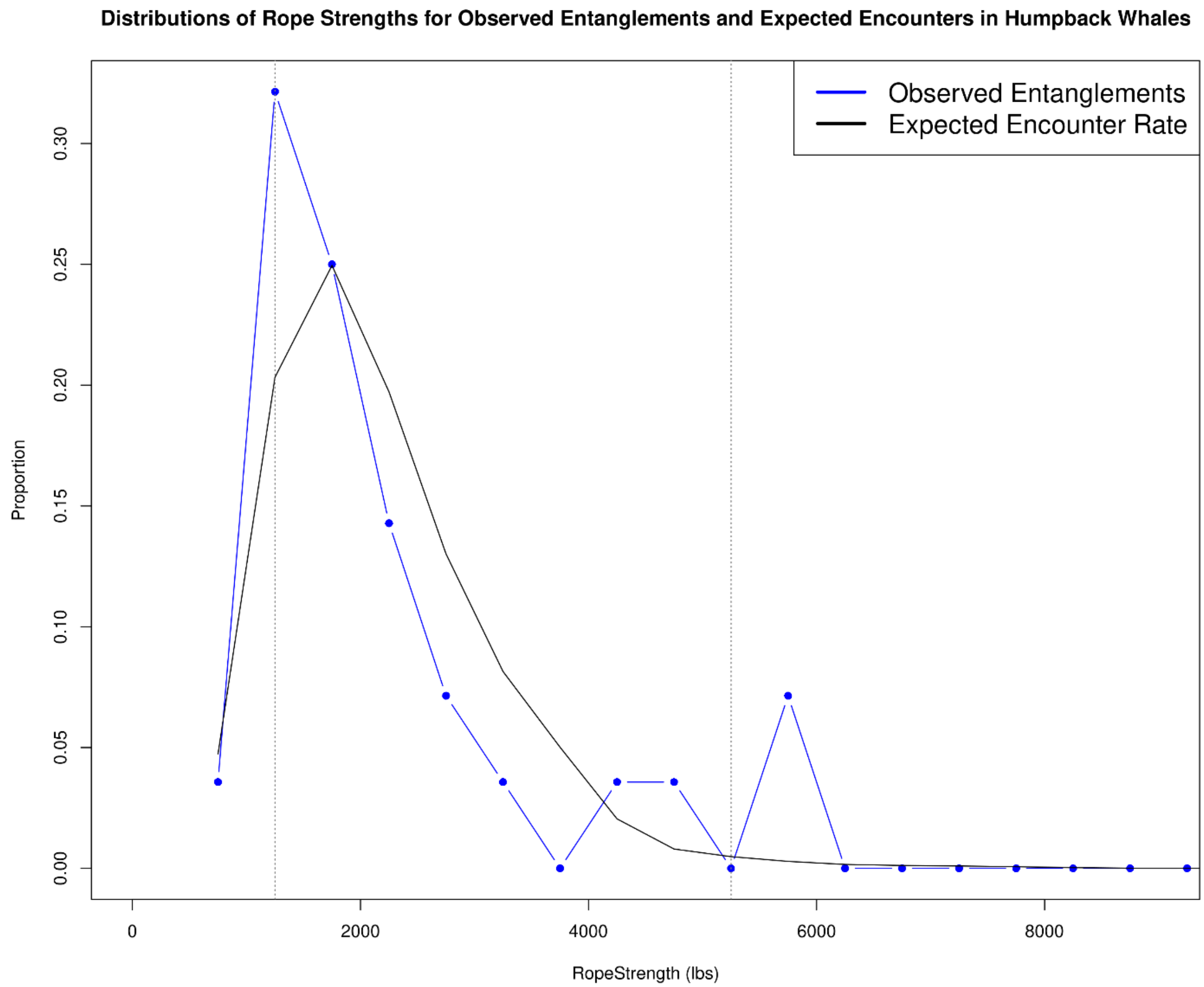

Figure 4.7.2.1.c Expected and observed distribution of rope strengths for Humpback Whales.

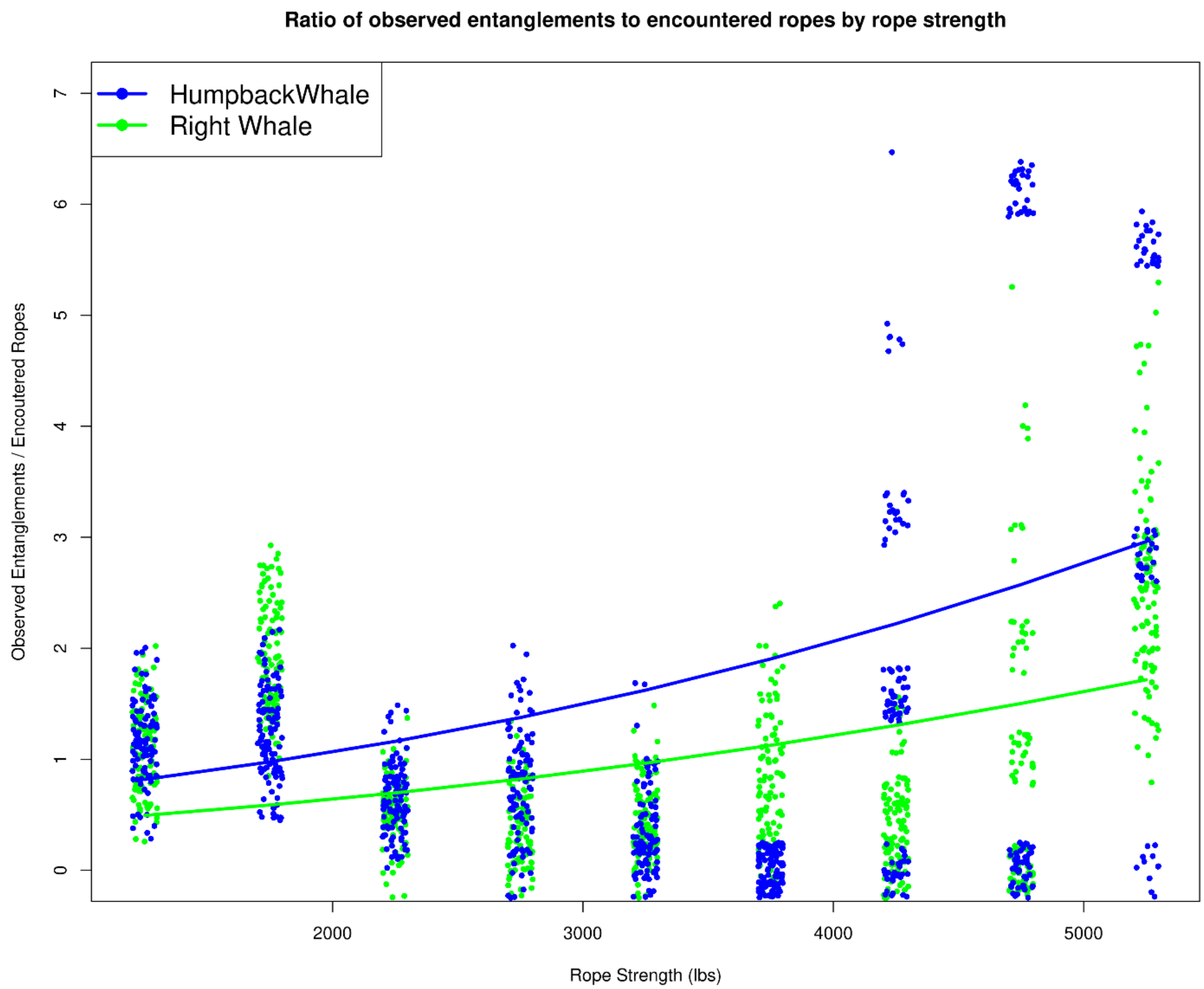

Figure 4.7.2.1.d Boot-strapped ratios of observed entanglement rope strength to expected encounter rope strength with fitted lines for Right Whales and Humpback Whales. The increase in ratio with rope strength is statistically significant but the species effect is not. Note lack of fit at intermediate and high rope strengths.

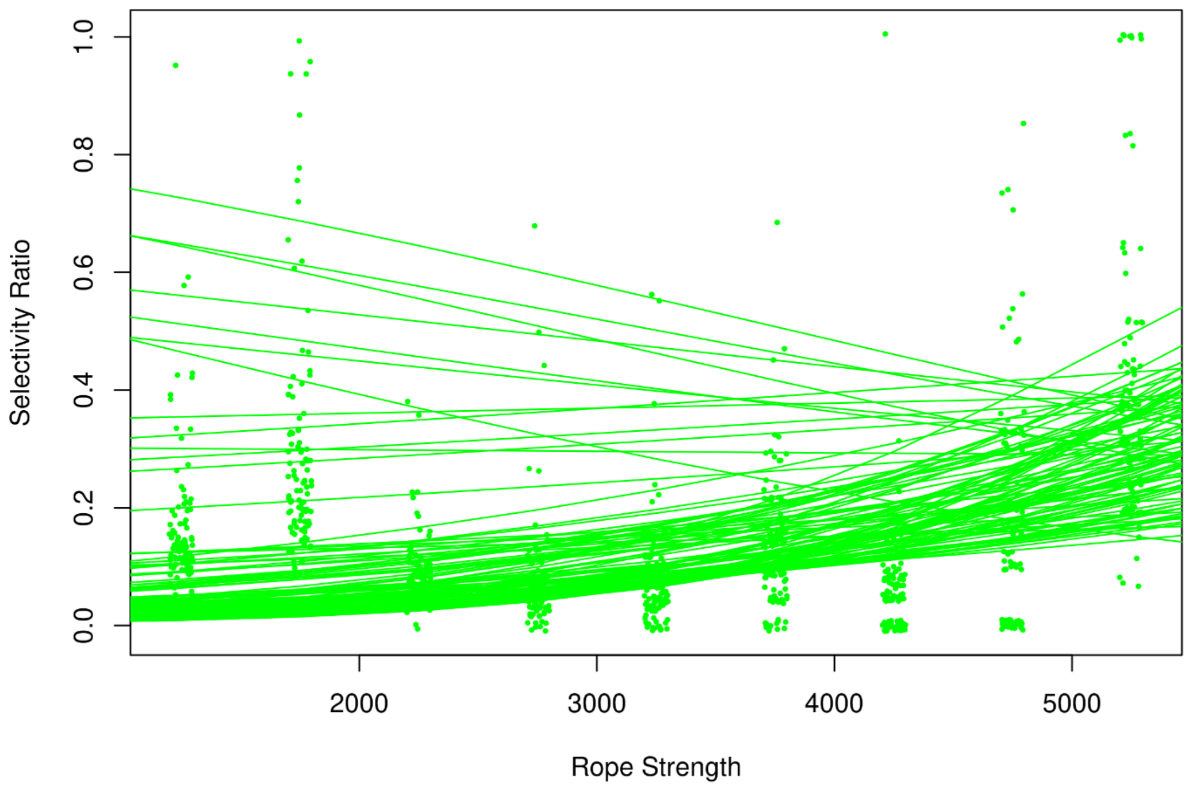

Figure 4.7.2.1.e. Example bootstrapped threat models from the relationship between rope strength and apparent selectivity ratio for Right Whales.

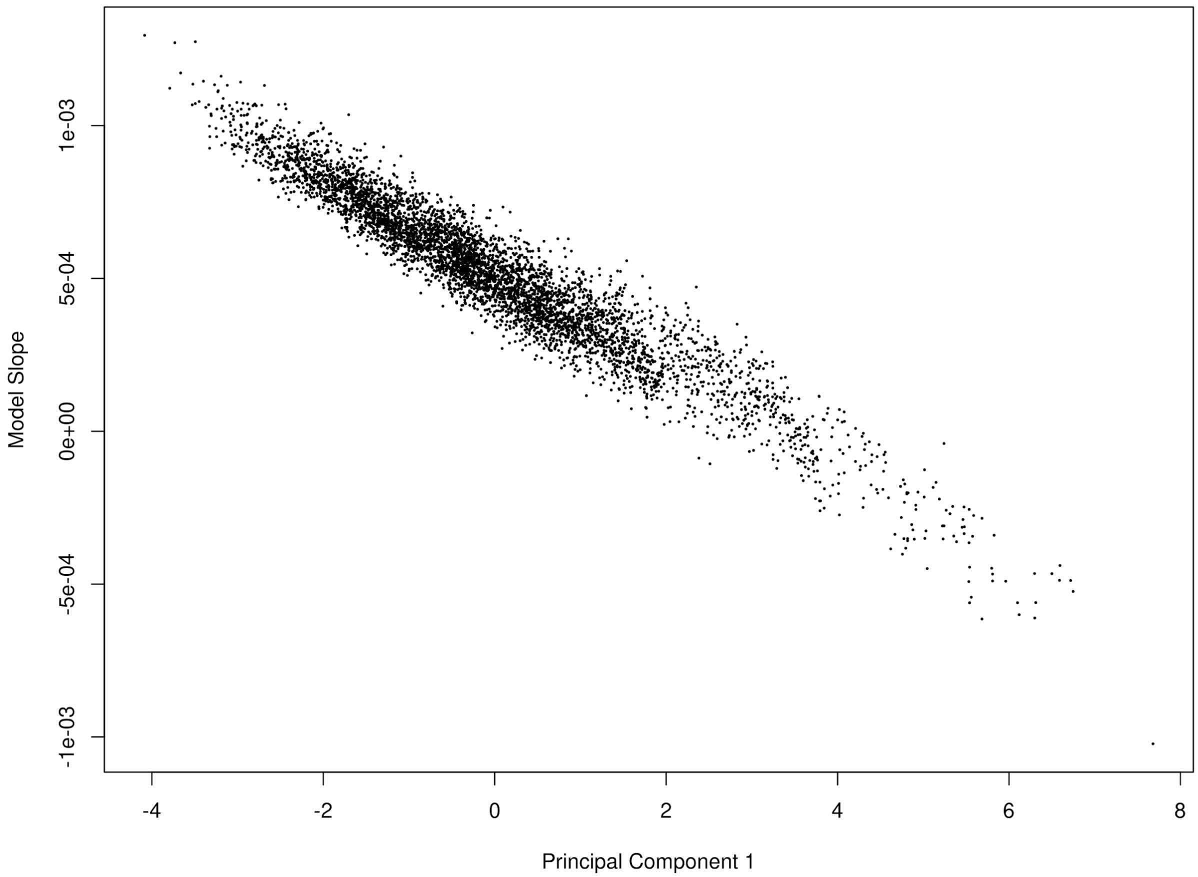

Figure 4.7.2.1.f. Relationship between threat model slope and first principal component.

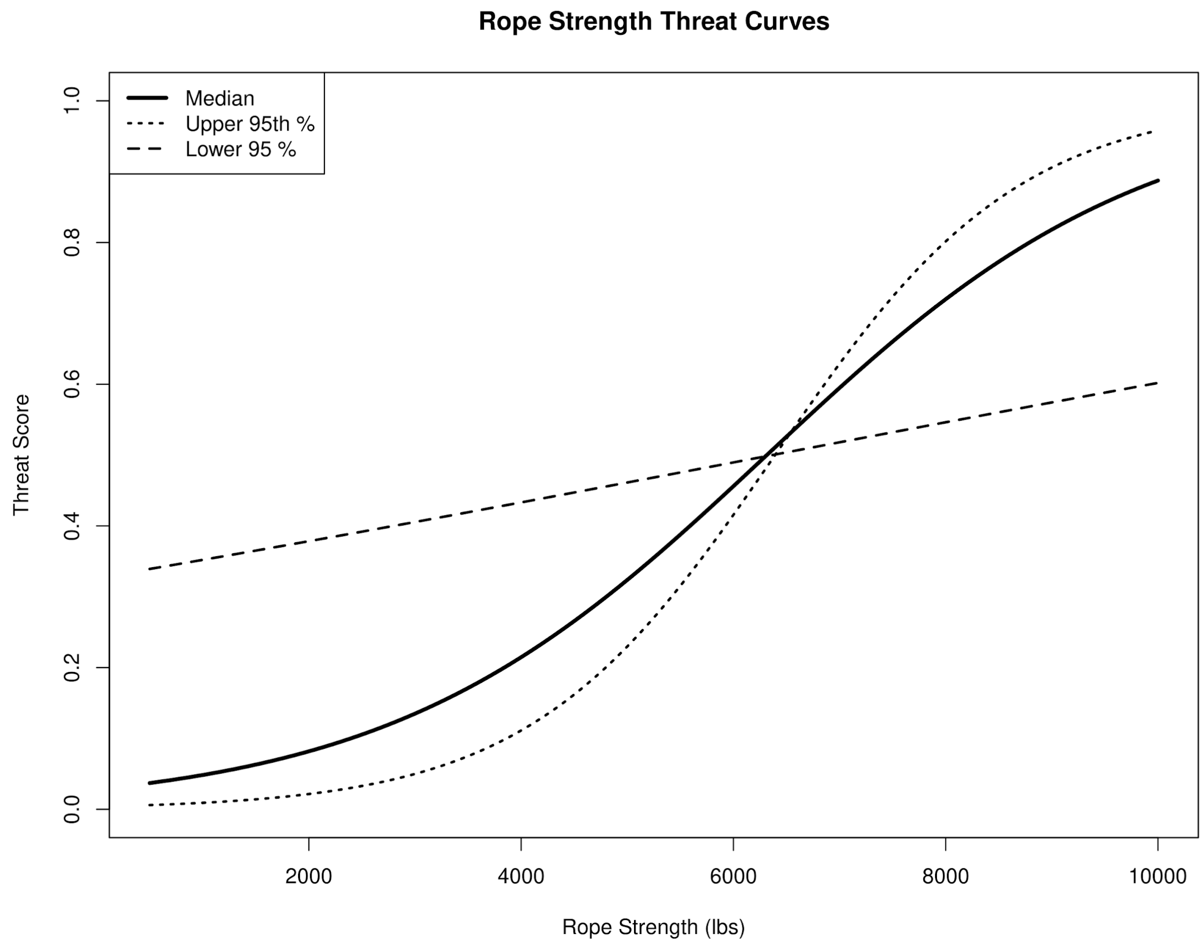

Figure 4.7.2.1.g. Alternate threat curves representing the median, upper and lower bounds on the relationship between rope strength and threat.

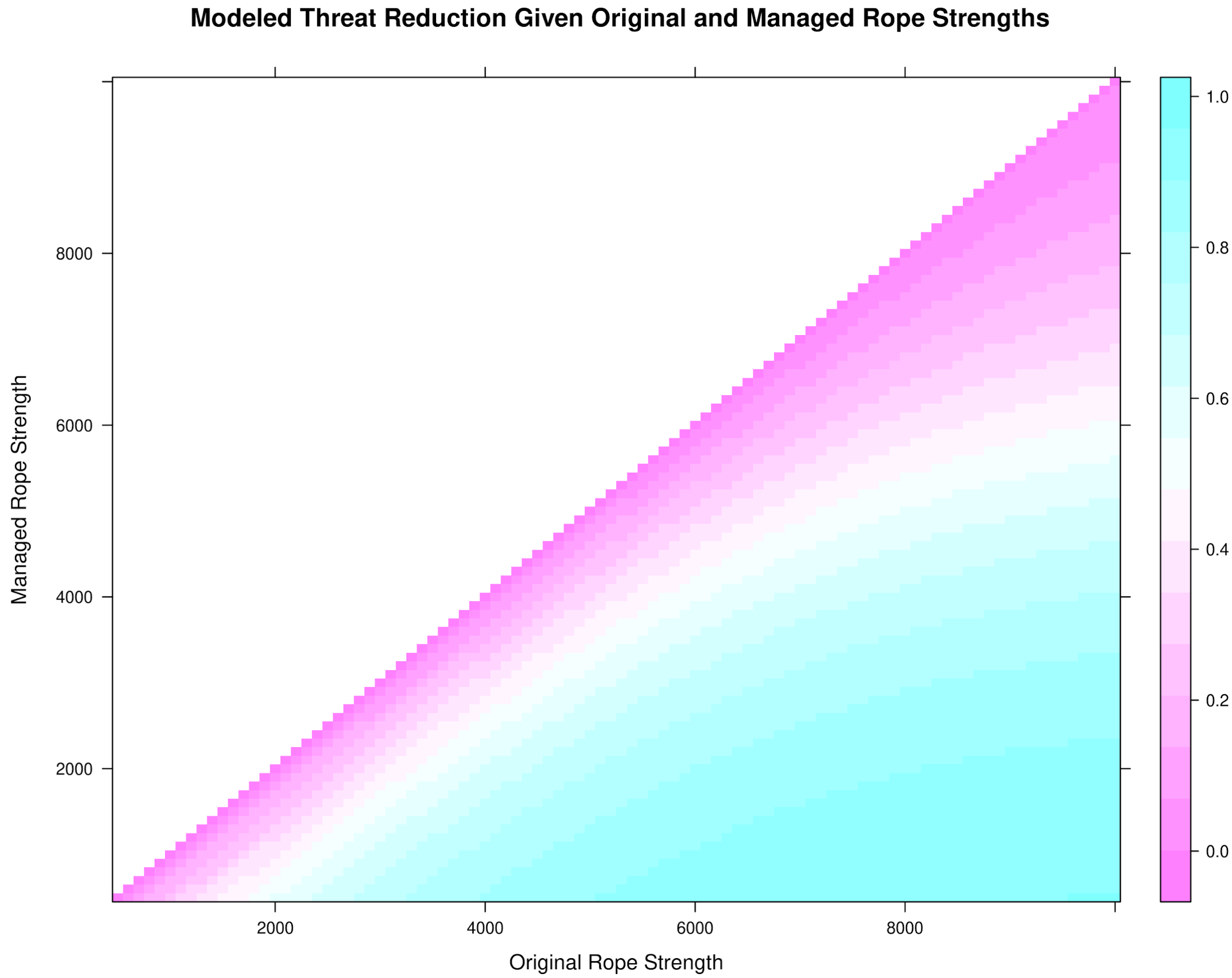

Figure 4.7.2.1.h. Relative threat surface derived from the <u>median</u> threat curve. Surface values represent the <u>reduction</u> in threat based on the ratio of threat scores between pre-management (x-axis) and post-management (y-axis) rope strengths. Thus, values along the diagonal represent no change in rope strength while the area below the diagonal represent decreases in rope strength.

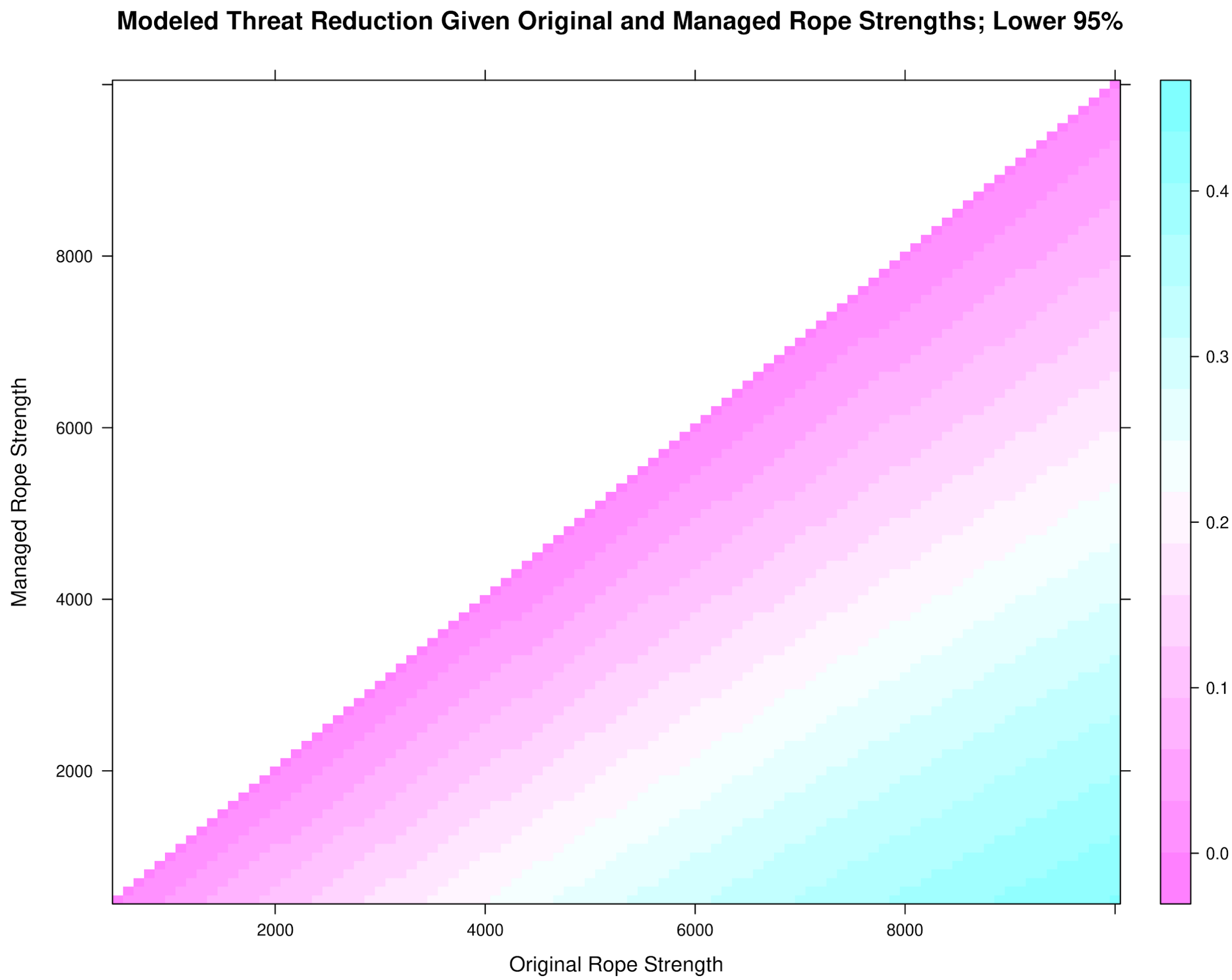

Figure 4.7.2.1.i. Relative threat surface derived from the lower bound threat curve. Surface values represent the reduction in threat based on the ratio of threat scores between pre-management (x-axis) and post-management (y-axis) rope strengths. Thus, values along the diagonal represent no change in rope strength while the area below the diagonal represent decreases in rope strength.

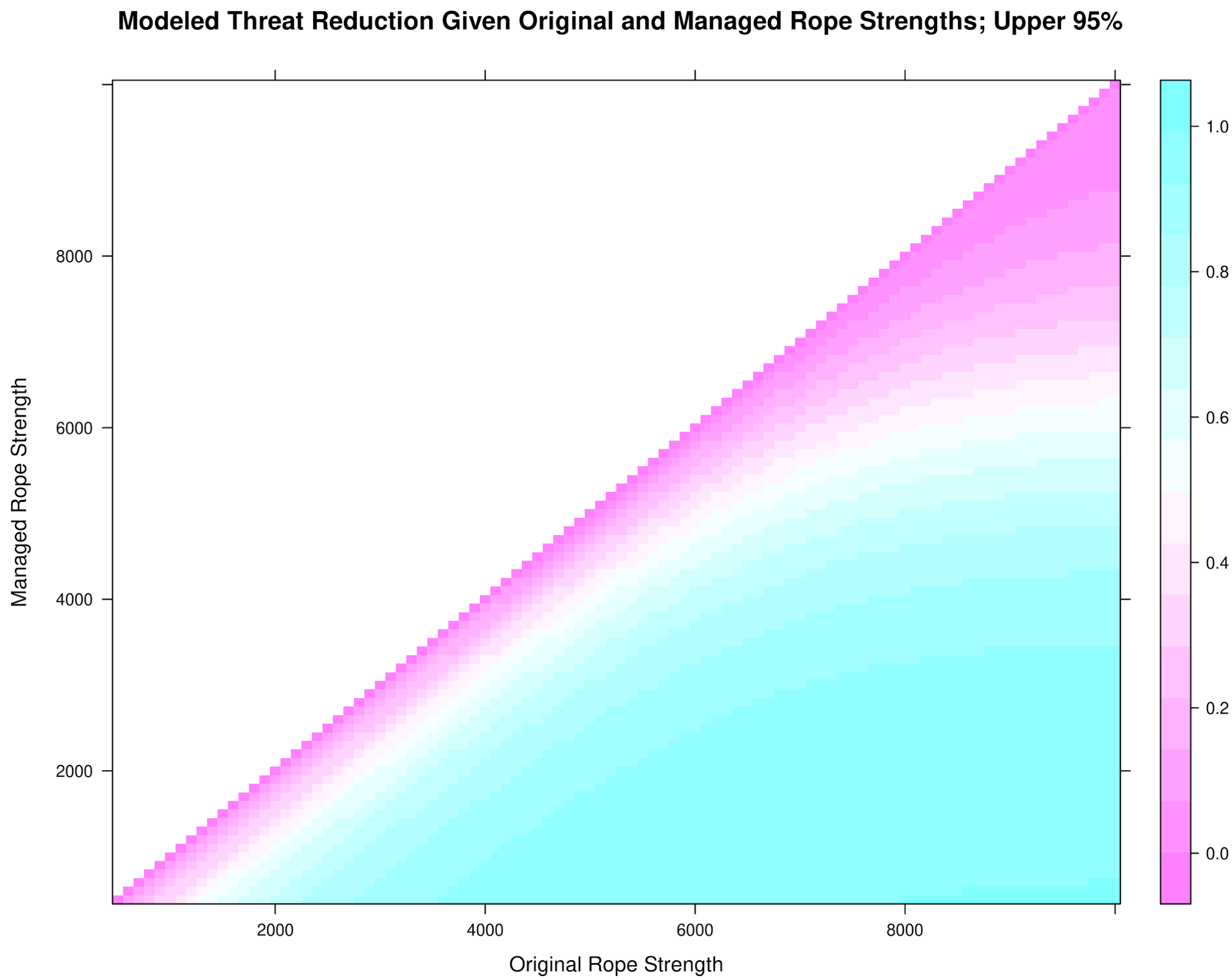

Figure 4.7.2.1.j. Relative threat surface derived from the upper bound threat curve. Surface values represent the reduction in threat based on the ratio of threat scores between pre-management (x-axis) and post-management (y-axis) rope strengths. Thus, values along the diagonal represent no change in rope strength while the area below the diagonal represent decreases in rope strength.

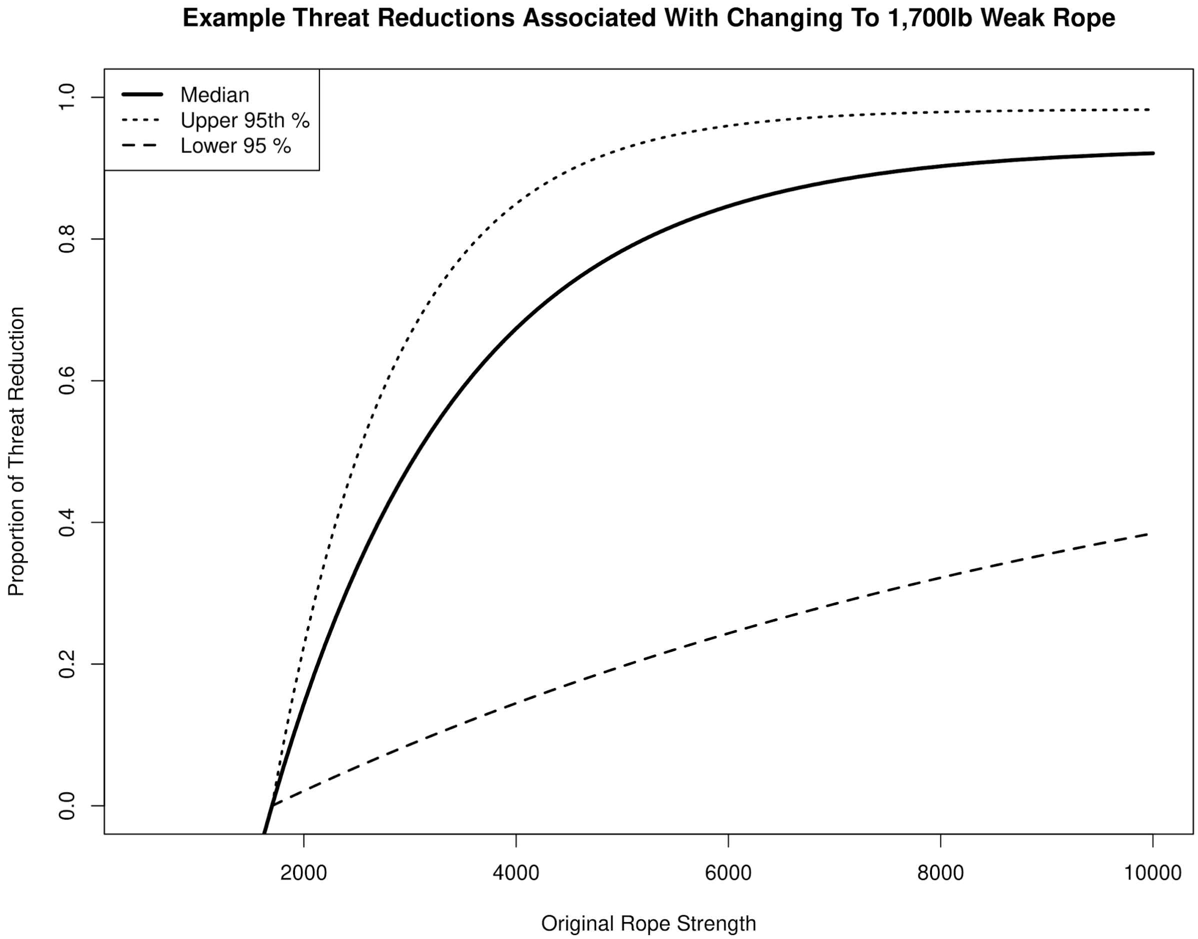

Figure 4.7.2.1.k. Threat reduction for decreasing rope strength to 1,700 lbs for the median, upper and lower bound threat curves.

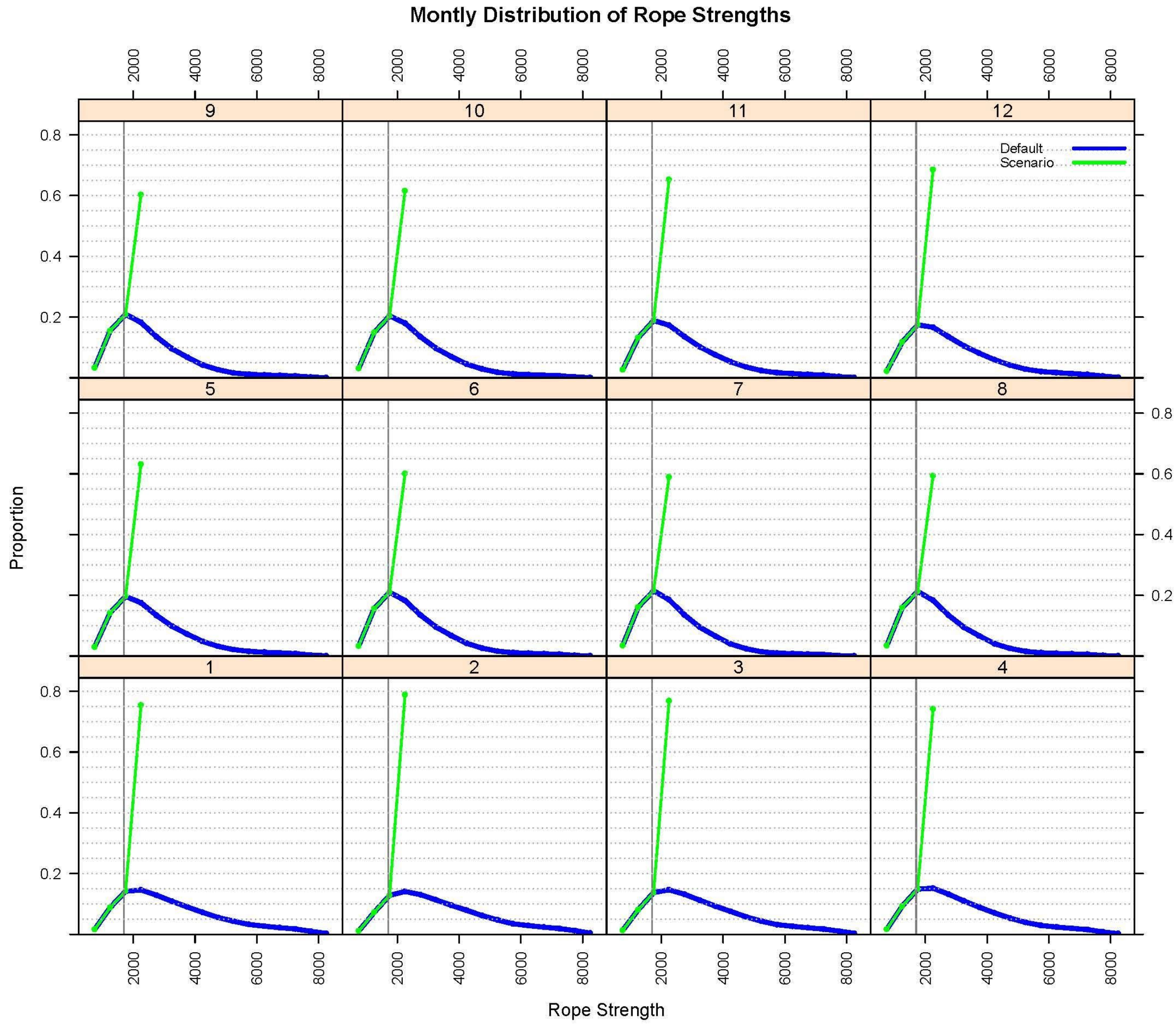

Figure 4.7.2.1.l. Distributions of rope strengths associated with a DST model run where maximum rope strength is decreased to 2,250 lbs.

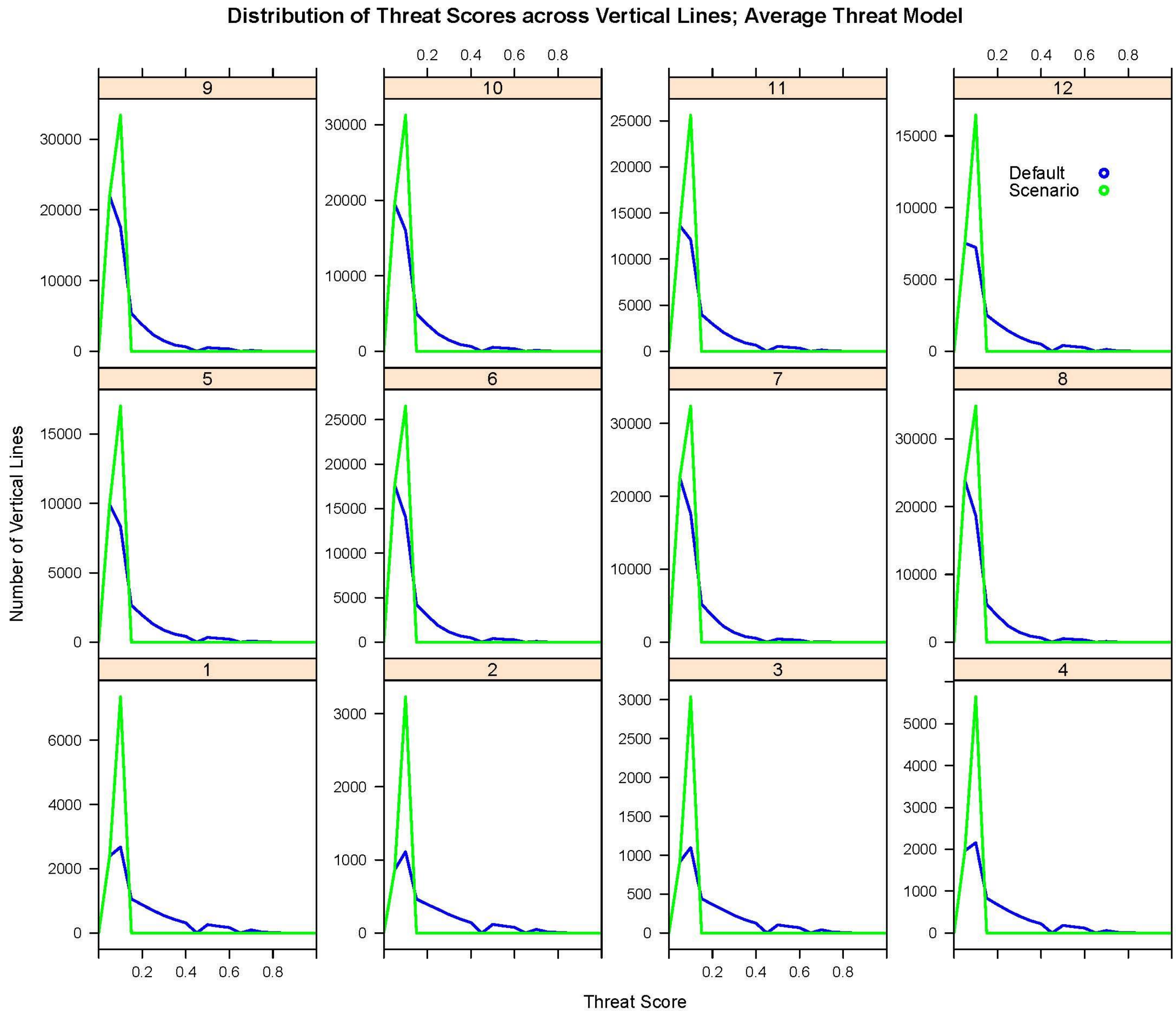

Figure 4.7.2.1.m. Distribution of gear threat scores for scenario vs default conditions for the median threat curve.

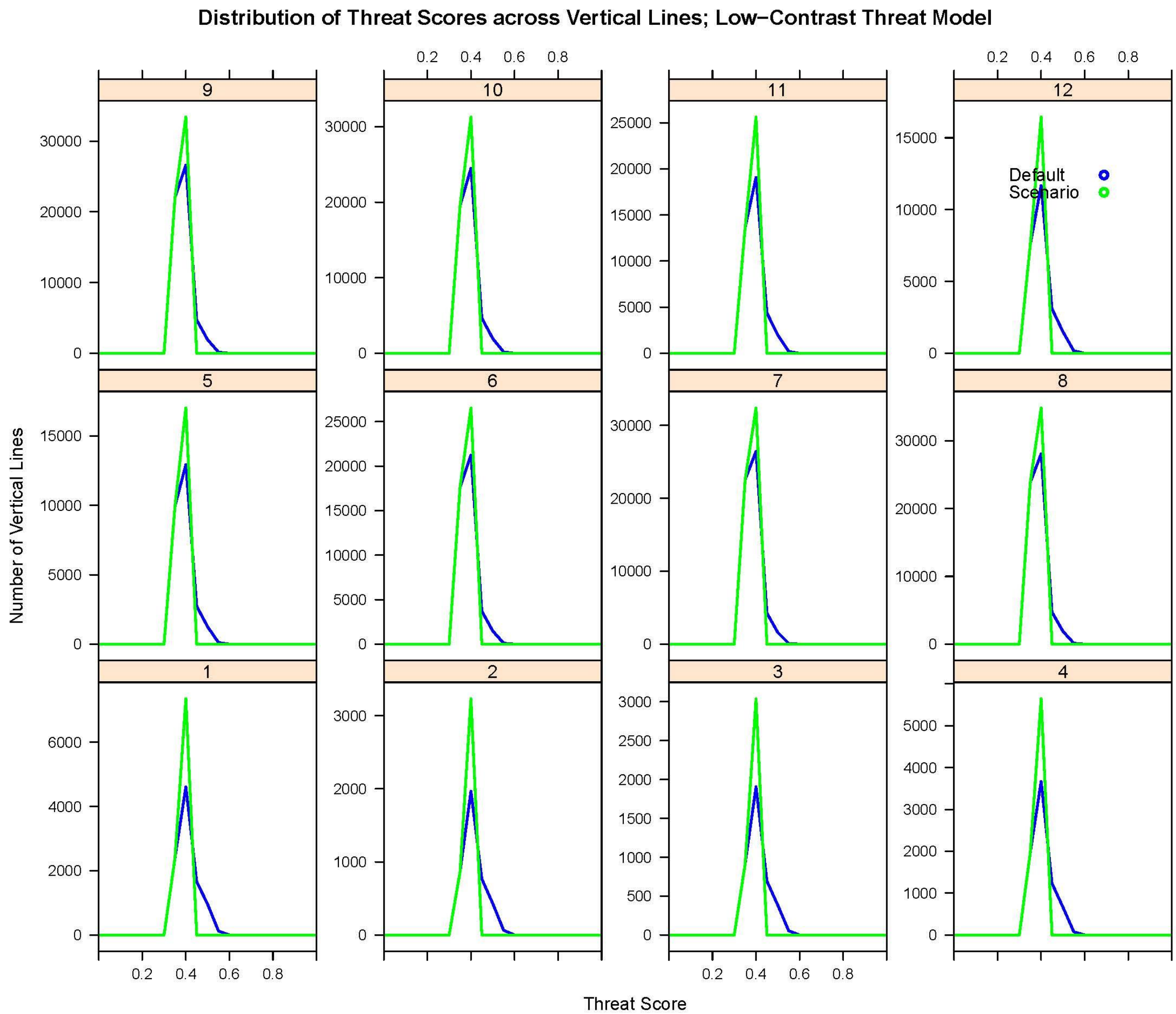

Figure 4.7.2.1.n. Distribution of gear threat scores for scenario vs default conditions for the lower-bound threat curve.

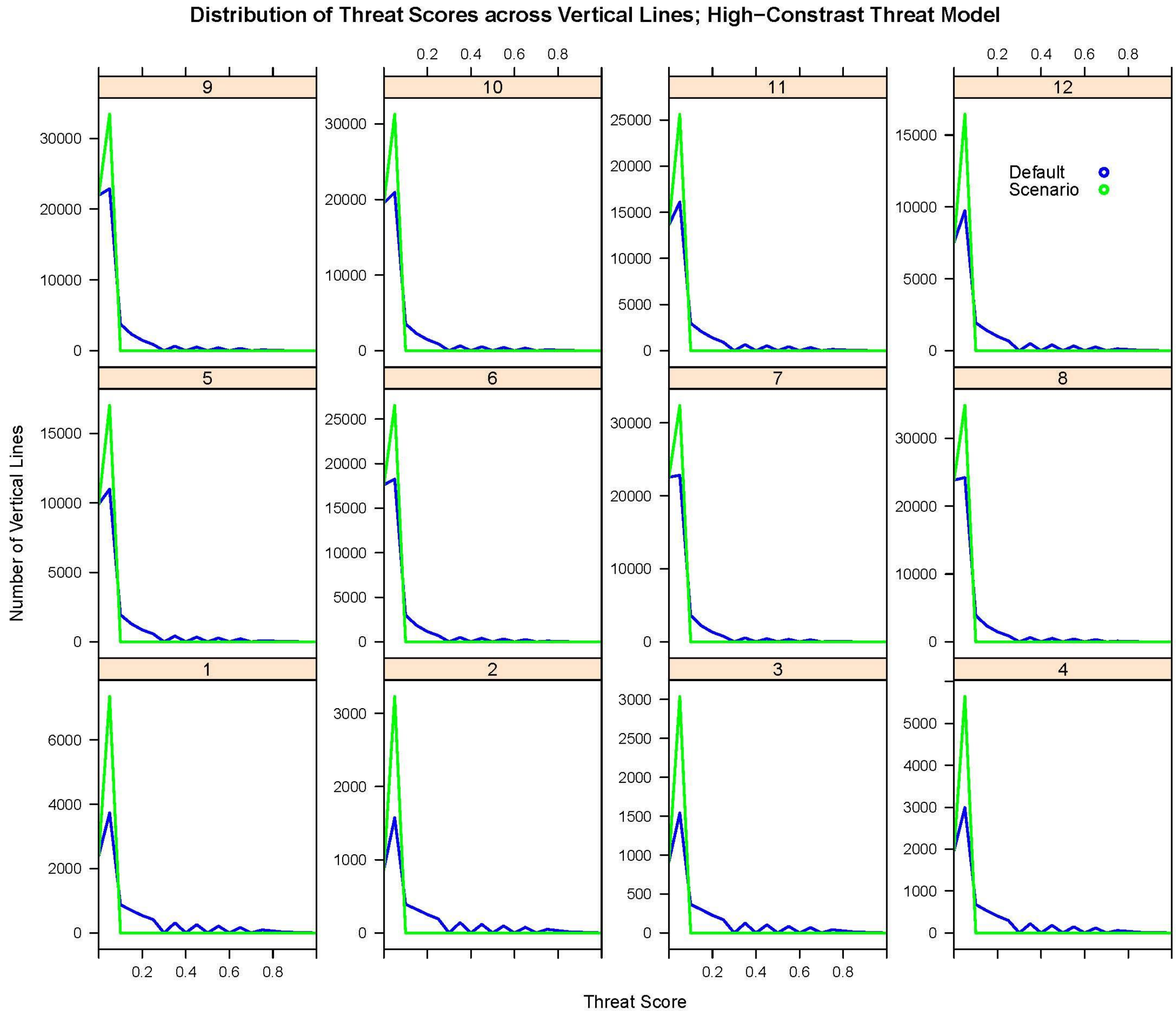

Figure 4.7.2.1.n. Distribution of gear threat scores for scenario vs default conditions for the upper-bound threat curve.

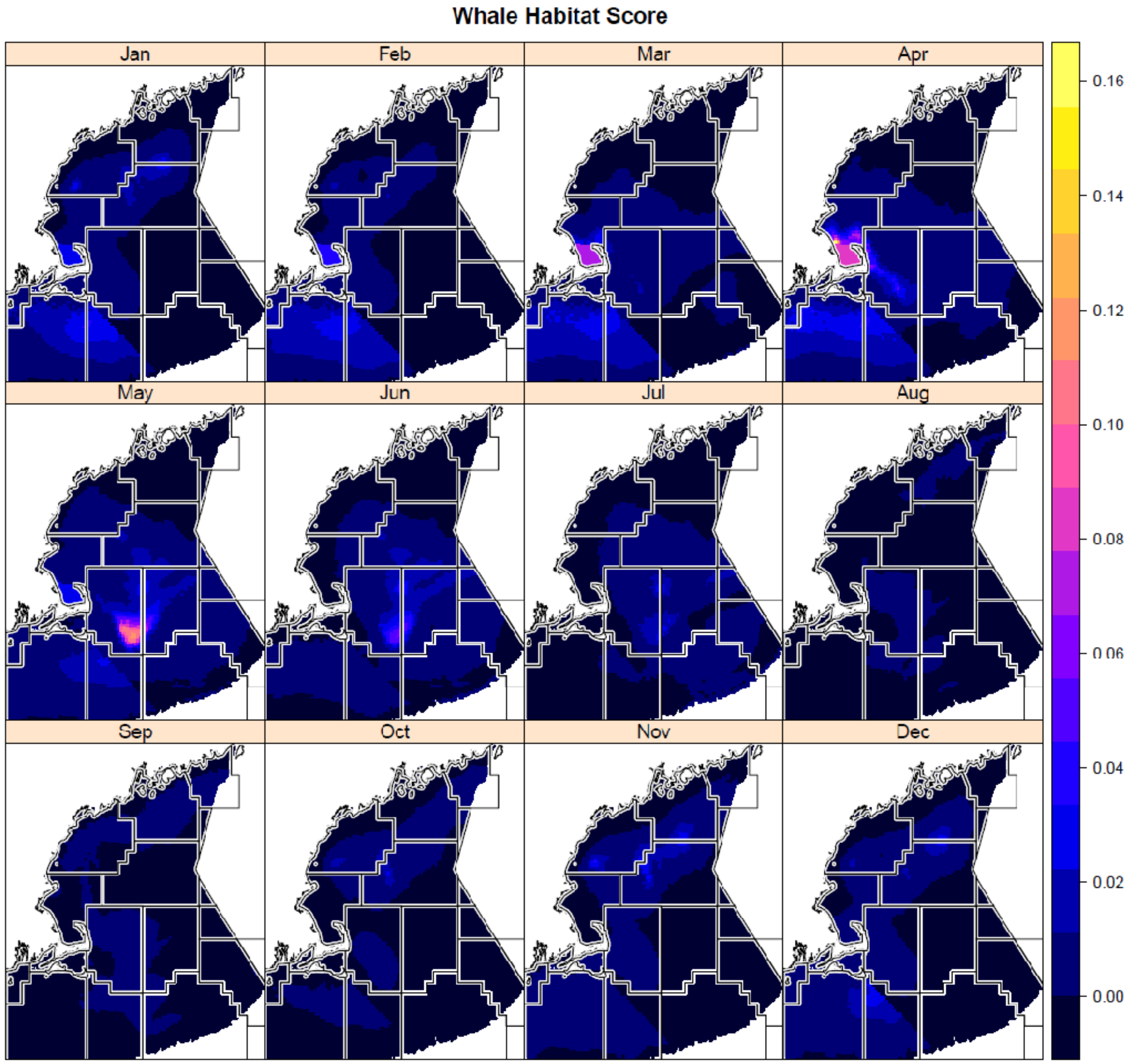

Figure 4.8.a. Monthly Right Whale density as predicted from the Duke whale habitat model v11.

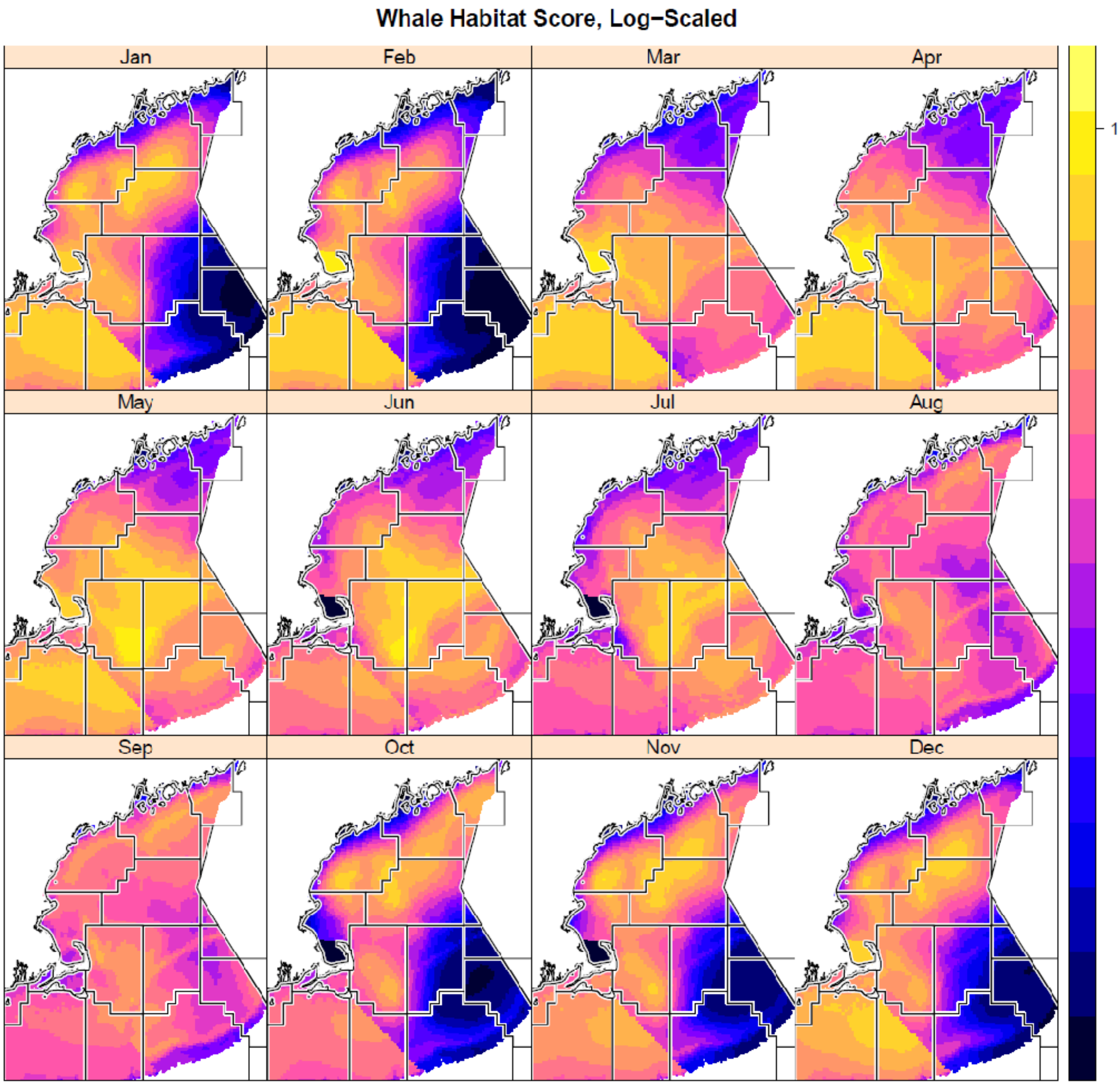

Figure 4.8.b. Monthly Right Whale density, log-scaled as predicted from the Duke whale habitat model v11.

Table 4.1.2.1.a Number of trawls observed by federal observers by year and statistical area. Offshore LMA3 statistical areas are shown in yellow.

Statistical Area	2012	2013	2014	2015	2016	2017	2018	Total
464	111	115	90	284				600
465	31	16	58	49				154
511			2	470				472
512	29	46	165	797	163			1200
513	134	614	290	2155	567	223	188	4171
514	29	3	183	583	145	54	77	1074
515	76	136	161	145				518
521	66			186	15	6		273
522		7	34	155				196
525	39	41	36	196				312
526			174	738				912
537			140	589	52	1	26	808
538			23	48	1	4	32	108
539			65	93		48	7	213
561	14	241	186	293				734
562	108	77	103	739				1027
611			39	58	100	84	18	299
612			163	263	323	241	146	1136
615			50	136	88		2	276
616			149	90				239
621			55	41	17	119	73	305
622			59			42	50	151
Total	637	1296	2225	8108	1471	822	619	

Table 4.1.2.5.a Estimated number of vertical lines in LMA3 for the Jonah crab, lobster, and combined fishery, compared to line estimates from the IEc

Month	Crab_Model	Lobster_Model	NMFS_Total	IEc
1	889	2,077	2,965	3,182
2	954	1,996	2,950	3,375
3	1,036	1,667	2,703	3,357
4	906	1,360	2,266	2,786
5	988	1,957	2,944	3,008
6	967	3,083	4,050	3,428
7	659	3,316	3,975	3,543
8	503	3,309	3,812	3,570
9	861	2,916	3,777	3,414
10	914	2,988	3,902	3,406
11	775	2,448	3,223	3,503
12	**859**	**2,731**	**3,590**	3,408

Table 4.7.2.1.a. Example DST Model run results implementing maximum rope strengths of 2,250 lbs; Changes in mean rope strength.

Mean Rope Strength

	Variable	Month	Default	Scenario	Reduction
1	RopeStrength	1	3,262.102	2,067.242	36.6 %
2	RopeStrength	2	3,396.574	2,097.760	38.2 %
3	RopeStrength	3	3,297.022	2,081.092	36.9 %
4	RopeStrength	4	3,173.710	2,058.107	35.2 %
5	RopeStrength	5	2,692.224	1,964.928	27.0 %
6	RopeStrength	6	2,552.181	1,939.294	24.0 %
7	RopeStrength	7	2,501.185	1,929.836	22.8 %
8	RopeStrength	8	2,528.225	1,932.905	23.5 %
9	RopeStrength	9	2,563.358	1,941.344	24.3 %
10	RopeStrength	10	2,614.564	1,952.064	25.3 %
11	RopeStrength	11	2,766.172	1,983.964	28.3 %
12	RopeStrength	12	2,910.518	2,011.903	30.9 %
13	RopeStrength	Total	2,653.339	1,958.825	26.2 %

Table 4.7.2.1.b. Example DST Model run results implementing maximum rope strengths of 2,250 lbs; Changes in total gear threat scores from the median threat curve.

	Variable	Month	Default	Scenario	Reduction
1	TotalGearThreat_Threat	1	1,779	818	54.0 %
2	TotalGearThreat_Threat	2	789	348	55.9 %
3	TotalGearThreat_Threat	3	729	334	54.3 %
4	TotalGearThreat_Threat	4	1,327	635	52.1 %
5	TotalGearThreat_Threat	5	3,676	2,158	41.3 %
6	TotalGearThreat_Threat	6	5,530	3,495	36.8 %
7	TotalGearThreat_Threat	7	6,654	4,327	35.0 %
8	TotalGearThreat_Threat	8	7,249	4,630	36.1 %
9	TotalGearThreat_Threat	9	6,985	4,386	37.2 %
10	TotalGearThreat_Threat	10	6,608	4,044	38.8 %
11	TotalGearThreat_Threat	11	5,562	3,170	43.0 %
12	TotalGearThreat_Threat	12	3,675	1,962	46.6 %
13	TotalGearThreat_Threat	Total	50,564	30,307	40.1 %

Table 4.7.2.1.c. Example DST Model run results implementing maximum rope strengths of 2,250 lbs; Changes in total gear threat scores from the lower-bound threat curve.

Total Gear Threat Score - Threat Lower Bound

	Variable	Month	Default	Scenario	Reduction
1	TotalGearThreat_Threat_Lower	1	4,014	3,692	8.0 %
2	TotalGearThreat_Threat_Lower	2	1,701	1,555	8.6 %
3	TotalGearThreat_Threat_Lower	3	1,631	1,499	8.1 %
4	TotalGearThreat_Threat_Lower	4	3,114	2,880	7.5 %
5	TotalGearThreat_Threat_Lower	5	10,675	10,136	5.1 %
6	TotalGearThreat_Threat_Lower	6	17,328	16,583	4.3 %
7	TotalGearThreat_Threat_Lower	7	21,474	20,612	4.0 %
8	TotalGearThreat_Threat_Lower	8	22,988	22,027	4.2 %
9	TotalGearThreat_Threat_Lower	9	21,742	20,795	4.4 %
10	TotalGearThreat_Threat_Lower	10	20,018	19,092	4.6 %
11	TotalGearThreat_Threat_Lower	11	15,625	14,780	5.4 %
12	TotalGearThreat_Threat_Lower	12	9,645	9,051	6.2 %
13	TotalGearThreat_Threat_Lower	Total	149,957	142,701	4.8 %

Table 4.7.2.1.d. Example DST Model run results implementing maximum rope strengths of 2,250 lbs; Changes in total gear threat scores from the upper-bound threat curve.

Total Gear Threat Score - Threat Upper Bound

	Variable	Month	Default	Scenario	Reduction
1	TotalGearThreat_Threat_Upper	1	1,121	223	80.1 %
2	TotalGearThreat_Threat_Upper	2	510	95	81.3 %
3	TotalGearThreat_Threat_Upper	3	460	91	80.2 %
4	TotalGearThreat_Threat_Upper	4	810	173	78.7 %
5	TotalGearThreat_Threat_Upper	5	1,899	575	69.7 %
6	TotalGearThreat_Threat_Upper	6	2,638	925	64.9 %
7	TotalGearThreat_Threat_Upper	7	3,068	1,142	62.8 %
8	TotalGearThreat_Threat_Upper	8	3,421	1,223	64.2 %
9	TotalGearThreat_Threat_Upper	9	3,361	1,161	65.4 %
10	TotalGearThreat_Threat_Upper	10	3,268	1,073	67.2 %
11	TotalGearThreat_Threat_Upper	11	2,948	848	71.2 %
12	TotalGearThreat_Threat_Upper	12	2,064	528	74.4 %
13	TotalGearThreat_Threat_Upper	Total	25,570	8,058	68.5 %

Appendix 3.2 Decision Support Tool Model Runs

3.2.1 FEIS Preferred Alternative: Lower Bound

The lower bound of the Preferred Alternative (Alternative 2) with the Massachusetts Restricted Area credit for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−23 23:14:42
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_MassRMA_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength	MaxGearSnglLn
1	Constraint_Spatial			NE_TrapPot_2020FEIS						
2	StringLength			Exempt_to_3_ME_ABFG			Min	2		
3	StringLength			Exempt_to_3_ME_CDE			Min	3		
4	StringLength			MaineZoneA_East			Min	20		
5	StringLength			MaineZoneA_West_3_6			Min	8		
6	StringLength			Three_to_6_ME_B			Exactly	5		
7	MaxGearWSingleLine			Three_to_6_ME_B						5
8	StringLength			Three_to_6_ME_CDEFG			Min	10		
9	StringLength			MaineZoneA_West_6_12			Min	15		
10	StringLength			Six_to_12_ME_B			Min	10		
11	StringLength			Six_to_12_ME_CG			Min	20		
12	StringLength			Six_to_12_ME_DEF			Min	10		
13	StringLength	A1	MA	6to12_A1_poly			Min	15		
14	StringLength	OCC		3nmi_to_12nmi			Min	15		
15	StringLength	A1		12nmi_to_EEZ_Boundary			Min	25		
16	StringLength	A2_3overlap					Min	40		
17	StringLength	A3		LMA3_Canyons_Simple			Min	35		
18	StringLength	A3		LMA3_NorthOfCanyons_Simple			Min	45		
19	StringLength			Georges_Basin_Restricted_Area			Min	50		
20	Closure			LMA1_Restricted_Area	10,11,12,1					
21	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4					
22	GearReduction			Massachusetts_Restricted_Area	2,3,4	1				
23	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1				
24	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1				
25	GearReduction	A3				0.12				
26	GearReduction	A2_3overlap				0.15				
27	GearReduction	A2				0.18				
28	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.3243			1700	
29	MaxRopeStrength			Three_to_12_ME_AwBCDE		0.181			1700	
30	MaxRopeStrength			Three_to_12_ME_AeFG		0.1015			1700	
31	MaxRopeStrength	A1	ME	12nmi_to_EEZ_Boundary		0.0472			1700	
32	MaxRopeStrength	A1	MA	Coast_to_3nmi_DST		0.5			1700	
33	MaxRopeStrength	OCC		Coast_to_3nmi_DST		0.5			1700	
34	MaxRopeStrength	A2		Coast_to_3nmi_DST		0.5			1700	
35	MaxRopeStrength	A1	MA	3nmi_to_12nmi		0.2933			1700	
36	MaxRopeStrength	OCC		3nmi_to_12nmi		0.3907			1700	
37	MaxRopeStrength	A2		3nmi_to_12nmi		0.5			1700	
38	MaxRopeStrength	A1	MA	12nmi_to_EEZ_Boundary		0.0786			1700	
39	MaxRopeStrength	A2		12nmi_to_EEZ_Boundary		0.5			1700	
40	MaxRopeStrength	OCC		12nmi_to_EEZ_Boundary		0.2049			1700	
41	MaxRopeStrength	A2_3overlap				0.4375			1700	
42	MaxRopeStrength	A3				0.375			1700	

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	56.00	37.3 %
2	RelativeRisk_CoOccurrence	2	55.27	24.37	55.9 %
3	RelativeRisk_CoOccurrence	3	57.33	16.92	70.5 %
4	RelativeRisk_CoOccurrence	4	329.67	40.37	87.8 %
5	RelativeRisk_CoOccurrence	5	315.51	24.80	92.1 %
6	RelativeRisk_CoOccurrence	6	19.10	13.36	30 %
7	RelativeRisk_CoOccurrence	7	10.16	6.92	31.9 %
8	RelativeRisk_CoOccurrence	8	24.98	21.24	15 %
9	RelativeRisk_CoOccurrence	9	81.84	68.04	16.9 %
10	RelativeRisk_CoOccurrence	10	60.48	36.82	39.1 %
11	RelativeRisk_CoOccurrence	11	72.50	38.15	47.4 %
12	RelativeRisk_CoOccurrence	12	94.32	72.26	23.4 %
13	RelativeRisk_CoOccurrence	Total	1,210.50	419.26	65.4 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	8.73	46.4 %
2	RelativeRisk_Threat	2	10.85	3.77	65.2 %
3	RelativeRisk_Threat	3	11.60	2.62	77.4 %
4	RelativeRisk_Threat	4	48.95	5.90	87.9 %
5	RelativeRisk_Threat	5	38.50	4.06	89.4 %
6	RelativeRisk_Threat	6	4.66	2.39	48.8 %
7	RelativeRisk_Threat	7	2.63	1.32	50.1 %
8	RelativeRisk_Threat	8	2.52	1.94	22.9 %
9	RelativeRisk_Threat	9	8.20	6.24	23.9 %
10	RelativeRisk_Threat	10	7.66	4.43	42.1 %
11	RelativeRisk_Threat	11	9.96	4.95	50.3 %
12	RelativeRisk_Threat	12	14.02	8.46	39.6 %
13	RelativeRisk_Threat	Total	175.85	54.82	68.8 %

3.2.2 FEIS Preferred Alternative: Upper Bound

The upper bound of the Preferred Alternative (Alternative 2) with the Massachusetts Restricted Area credit for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−23 21:07:48
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative_upper.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_MassRMA_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength	MaxGearSnglLn
1	Constraint_Spatial			NE_TrapPot_2020FEIS						
2	StringLength			Exempt_to_3_ME_ABFG			Min	2		
3	StringLength			Exempt_to_3_ME_CDE			Min	3		
4	StringLength			MaineZoneA_East			Min	20		
5	StringLength			MaineZoneA_West_3_6			Min	8		
6	StringLength			Three_to_6_ME_B			Exactly	5		
7	MaxGearWSingleLine			Three_to_6_ME_B						5
8	StringLength			Three_to_6_ME_CDEFG			Min	10		
9	StringLength			MaineZoneA_West_6_12			Min	15		
10	StringLength			Six_to_12_ME_B			Min	10		
11	StringLength			Six_to_12_ME_CG			Min	20		
12	StringLength			Six_to_12_ME_DEF			Min	10		
13	StringLength	A1	MA	6to12_A1_poly			Min	15		
14	StringLength	OCC		3nmi_to_12nmi			Min	15		
15	StringLength	A1		12nmi_to_EEZ_Boundary			Min	25		
16	StringLength	A2_3overlap					Min	40		
17	StringLength	A3		LMA3_Canyons_Simple			Min	35		
18	StringLength	A3		LMA3_NorthOfCanyons_Simple			Min	45		
19	StringLength			Georges_Basin_Restricted_Area			Min	50		
20	Closure			LMA1_Restricted_Area	10,11,12,1					
21	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4					
22	GearReduction			Massachusetts_Restricted_Area	2,3,4	1				
23	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1				
24	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1				
25	GearReduction	A3				0.12				
26	GearReduction	A2_3overlap				0.15				
27	GearReduction	A2				0.18				
28	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.5			1700	
29	MaxRopeStrength			Three_to_12_ME_AwBCDE		0.5			1700	
30	MaxRopeStrength			Three_to_12_ME_AeFG		0.33			1700	
31	MaxRopeStrength	A1	ME	12nmi_to_EEZ_Boundary		0.33			1700	
32	MaxRopeStrength	A1	MA	Coast_to_3nmi_DST		0.75			1700	
33	MaxRopeStrength	OCC		Coast_to_3nmi_DST		0.75			1700	
34	MaxRopeStrength	A2		Coast_to_3nmi_DST		0.75			1700	
35	MaxRopeStrength	A1	MA	3nmi_to_12nmi		0.5			1700	
36	MaxRopeStrength	OCC		3nmi_to_12nmi		0.5			1700	
37	MaxRopeStrength	A2		3nmi_to_12nmi		0.75			1700	
38	MaxRopeStrength	A1	MA	12nmi_to_EEZ_Boundary		0.33			1700	
39	MaxRopeStrength	A2		12nmi_to_EEZ_Boundary		0.75			1700	
40	MaxRopeStrength	OCC		12nmi_to_EEZ_Boundary		0.33			1700	
41	MaxRopeStrength	A2_3overlap				0.75			1700	
42	MaxRopeStrength	A3				0.375			1700	

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	56.00	37.3 %
2	RelativeRisk_CoOccurrence	2	55.27	24.37	55.9 %
3	RelativeRisk_CoOccurrence	3	57.33	16.92	70.5 %
4	RelativeRisk_CoOccurrence	4	329.67	40.37	87.8 %
5	RelativeRisk_CoOccurrence	5	315.51	24.80	92.1 %
6	RelativeRisk_CoOccurrence	6	19.10	13.36	30 %
7	RelativeRisk_CoOccurrence	7	10.16	6.92	31.9 %
8	RelativeRisk_CoOccurrence	8	24.98	21.24	15 %
9	RelativeRisk_CoOccurrence	9	81.84	68.04	16.9 %
10	RelativeRisk_CoOccurrence	10	60.48	36.82	39.1 %
11	RelativeRisk_CoOccurrence	11	72.50	38.15	47.4 %
12	RelativeRisk_CoOccurrence	12	94.32	72.26	23.4 %
13	RelativeRisk_CoOccurrence	Total	1,210.50	419.26	65.4 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	7.28	55.4 %
2	RelativeRisk_Threat	2	10.85	3.34	69.3 %
3	RelativeRisk_Threat	3	11.60	2.34	79.8 %
4	RelativeRisk_Threat	4	48.95	5.08	89.6 %
5	RelativeRisk_Threat	5	38.50	3.60	90.7 %
6	RelativeRisk_Threat	6	4.66	2.30	50.8 %
7	RelativeRisk_Threat	7	2.63	1.28	51.3 %
8	RelativeRisk_Threat	8	2.52	1.77	29.6 %
9	RelativeRisk_Threat	9	8.20	5.68	30.8 %
10	RelativeRisk_Threat	10	7.66	3.85	49.8 %
11	RelativeRisk_Threat	11	9.96	4.28	57 %
12	RelativeRisk_Threat	12	14.02	7.15	49 %
13	RelativeRisk_Threat	Total	175.85	47.93	72.7 %

3.2.3 FEIS Preferred Alternative: Restricted Areas

The lower bound of the restricted areas in the Preferred Alternative (Alternative 2), including the Massachusetts Restricted Area credit for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−23 19:15:47
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative_RA.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_MassRMA_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage
1	Constraint_Spatial			NE_TrapPot_2020FEIS		
2	Closure			LMA1_Restricted_Area	10,11,12,1	
3	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4	
4	GearReduction			Massachusetts_Restricted_Area	2,3,4	1
5	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1
6	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	68.62	23.2 %
2	RelativeRisk_CoOccurrence	2	55.27	30.88	44.1 %
3	RelativeRisk_CoOccurrence	3	57.33	20.30	64.6 %
4	RelativeRisk_CoOccurrence	4	329.67	46.36	85.9 %
5	RelativeRisk_CoOccurrence	5	315.51	31.36	90.1 %
6	RelativeRisk_CoOccurrence	6	19.10	19.10	0 %
7	RelativeRisk_CoOccurrence	7	10.16	10.16	0 %
8	RelativeRisk_CoOccurrence	8	24.98	24.98	0 %
9	RelativeRisk_CoOccurrence	9	81.84	81.84	0 %
10	RelativeRisk_CoOccurrence	10	60.48	50.58	16.4 %
11	RelativeRisk_CoOccurrence	11	72.50	50.49	30.4 %
12	RelativeRisk_CoOccurrence	12	94.32	80.11	15.1 %
13	RelativeRisk_CoOccurrence	Total	1,210.50	514.78	57.5 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	13.58	16.7 %
2	RelativeRisk_Threat	2	10.85	5.80	46.5 %
3	RelativeRisk_Threat	3	11.60	4.18	63.9 %
4	RelativeRisk_Threat	4	48.95	8.48	82.7 %
5	RelativeRisk_Threat	5	38.50	6.63	82.8 %
6	RelativeRisk_Threat	6	4.66	4.66	0 %
7	RelativeRisk_Threat	7	2.63	2.63	0 %
8	RelativeRisk_Threat	8	2.52	2.52	0 %
9	RelativeRisk_Threat	9	8.20	8.20	0 %
10	RelativeRisk_Threat	10	7.66	6.32	17.5 %
11	RelativeRisk_Threat	11	9.96	7.00	29.7 %
12	RelativeRisk_Threat	12	14.02	12.07	13.9 %
13	RelativeRisk_Threat	Total	175.85	82.09	53.3 %

3.2.4 FEIS Preferred Alternative: Restricted Areas and Trawl Length Measures

The lower bound of the restricted areas and trawl length measures in the Preferred Alternative (Alternative 2), including the Massachusetts Restricted Area credit for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−23 17:21:06
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative_RA_TU.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_MassRMA_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxGearSnglLn
1	Constraint_Spatial			NE_TrapPot_2020FEIS					
2	StringLength			Exempt_to_3_ME_ABFG			Min	2	
3	StringLength			Exempt_to_3_ME_CDE			Min	3	
4	StringLength			MaineZoneA_East			Min	20	
5	StringLength			MaineZoneA_West_3_6			Min	8	
6	StringLength			Three_to_6_ME_B			Exactly	5	
7	MaxGearWSingleLine			Three_to_6_ME_B					5
8	StringLength			Three_to_6_ME_CDEFG			Min	10	
9	StringLength			MaineZoneA_West_6_12			Min	15	
10	StringLength			Six_to_12_ME_B			Min	10	
11	StringLength			Six_to_12_ME_CG			Min	20	
12	StringLength			Six_to_12_ME_DEF			Min	10	
13	StringLength	A1	MA	6to12_A1_poly			Min	15	
14	StringLength	OCC		3nmi_to_12nmi			Min	15	
15	StringLength	A1		12nmi_to_EEZ_Boundary			Min	25	
16	StringLength	A2_3overlap					Min	40	
17	StringLength	A3		LMA3_Canyons_Simple			Min	35	
18	StringLength	A3		LMA3_NorthOfCanyons_Simple			Min	45	
19	StringLength			Georges_Basin_Restricted_Area			Min	50	
20	Closure			LMA1_Restricted_Area	10,11,12,1				
21	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4				
22	GearReduction			Massachusetts_Restricted_Area	2,3,4	1			
23	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1			
24	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1			

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	59.55	33.3 %
2	RelativeRisk_CoOccurrence	2	55.27	26.88	51.4 %
3	RelativeRisk_CoOccurrence	3	57.33	19.53	65.9 %
4	RelativeRisk_CoOccurrence	4	329.67	44.79	86.4 %
5	RelativeRisk_CoOccurrence	5	315.51	27.32	91.3 %
6	RelativeRisk_CoOccurrence	6	19.10	14.73	22.9 %
7	RelativeRisk_CoOccurrence	7	10.16	7.71	24.1 %
8	RelativeRisk_CoOccurrence	8	24.98	21.29	14.8 %
9	RelativeRisk_CoOccurrence	9	81.84	68.11	16.8 %
10	RelativeRisk_CoOccurrence	10	60.48	36.96	38.9 %
11	RelativeRisk_CoOccurrence	11	72.50	38.62	46.7 %
12	RelativeRisk_CoOccurrence	12	94.32	74.23	21.3 %
13	RelativeRisk_CoOccurrence	Total	1,210.50	439.72	63.7 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	12.27	24.8 %
2	RelativeRisk_Threat	2	10.85	5.21	52 %
3	RelativeRisk_Threat	3	11.60	4.03	65.3 %
4	RelativeRisk_Threat	4	48.95	8.23	83.2 %
5	RelativeRisk_Threat	5	38.50	5.83	84.9 %
6	RelativeRisk_Threat	6	4.66	3.59	23.1 %
7	RelativeRisk_Threat	7	2.63	2.00	23.9 %
8	RelativeRisk_Threat	8	2.52	2.14	14.9 %
9	RelativeRisk_Threat	9	8.20	6.84	16.6 %
10	RelativeRisk_Threat	10	7.66	4.77	37.7 %
11	RelativeRisk_Threat	11	9.96	5.52	44.5 %
12	RelativeRisk_Threat	12	14.02	11.26	19.6 %
13	RelativeRisk_Threat	Total	175.85	71.70	59.2 %

3.2.5 FEIS Preferred Alternative: Restricted Areas, Trawl Length Measures, and Planned Line Reduction

The lower bound of the restricted areas, trawl length, and other planned line reduction measures in the Preferred Alternative (Alternative 2), including the Massachusetts Restricted Area credit for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−23 15:27:24
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative_RA_TU_PLR.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_MassRMA_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxGearSnglLn
1	Constraint_Spatial			NE_TrapPot_2020FEIS					
2	StringLength			Exempt_to_3_ME_ABFG			Min	2	
3	StringLength			Exempt_to_3_ME_CDE			Min	3	
4	StringLength			MaineZoneA_East			Min	20	
5	StringLength			MaineZoneA_West_3_6			Min	8	
6	StringLength			Three_to_6_ME_B			Exactly	5	
7	MaxGearWSingleLine			Three_to_6_ME_B					5
8	StringLength			Three_to_6_ME_CDEFG			Min	10	
9	StringLength			MaineZoneA_West_6_12			Min	15	
10	StringLength			Six_to_12_ME_B			Min	10	
11	StringLength			Six_to_12_ME_CG			Min	20	
12	StringLength			Six_to_12_ME_DEF			Min	10	
13	StringLength	A1	MA	6to12_A1_poly			Min	15	
14	StringLength	OCC		3nmi_to_12nmi			Min	15	
15	StringLength	A1		12nmi_to_EEZ_Boundary			Min	25	
16	StringLength	A2_3overlap					Min	40	
17	StringLength	A3		LMA3_Canyons_Simple			Min	35	
18	StringLength	A3		LMA3_NorthOfCanyons_Simple			Min	45	
19	StringLength			Georges_Basin_Restricted_Area			Min	50	
20	Closure			LMA1_Restricted_Area	10,11,12,1				
21	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4				
22	GearReduction			Massachusetts_Restricted_Area	2,3,4	1			
23	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1			
24	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1			
25	GearReduction	A3				0.12			
26	GearReduction	A2_3overlap				0.15			
27	GearReduction	A2				0.18			

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	56.00	37.3 %
2	RelativeRisk_CoOccurrence	2	55.27	24.37	55.9 %
3	RelativeRisk_CoOccurrence	3	57.33	16.92	70.5 %
4	RelativeRisk_CoOccurrence	4	329.67	40.37	87.8 %
5	RelativeRisk_CoOccurrence	5	315.51	24.80	92.1 %
6	RelativeRisk_CoOccurrence	6	19.10	13.36	30 %
7	RelativeRisk_CoOccurrence	7	10.16	6.92	31.9 %
8	RelativeRisk_CoOccurrence	8	24.98	21.24	15 %
9	RelativeRisk_CoOccurrence	9	81.84	68.04	16.9 %
10	RelativeRisk_CoOccurrence	10	60.48	36.82	39.1 %
11	RelativeRisk_CoOccurrence	11	72.50	38.15	47.4 %
12	RelativeRisk_CoOccurrence	12	94.32	72.26	23.4 %
13	RelativeRisk_CoOccurrence	Total	1,210.50	419.26	65.4 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	11.30	30.7 %
2	RelativeRisk_Threat	2	10.85	4.70	56.7 %
3	RelativeRisk_Threat	3	11.60	3.53	69.6 %
4	RelativeRisk_Threat	4	48.95	7.53	84.6 %
5	RelativeRisk_Threat	5	38.50	5.26	86.3 %
6	RelativeRisk_Threat	6	4.66	3.21	31.2 %
7	RelativeRisk_Threat	7	2.63	1.78	32.3 %
8	RelativeRisk_Threat	8	2.52	2.13	15.3 %
9	RelativeRisk_Threat	9	8.20	6.83	16.8 %
10	RelativeRisk_Threat	10	7.66	4.74	38.2 %
11	RelativeRisk_Threat	11	9.96	5.41	45.7 %
12	RelativeRisk_Threat	12	14.02	10.79	23 %
13	RelativeRisk_Threat	Total	175.85	67.21	61.8 %

3.2.6 FEIS Preferred Alternative: No Massachusetts Restricted Area Credit

The lower bound of the Preferred Alternative (Alternative 2) without the Massachusetts Restricted Area credit for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−22 16:39:29
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative_NoMRA.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength	MaxGearSnglLn
1	Constraint_Spatial			NE_TrapPot_2020FEIS						
2	StringLength			Exempt_to_3_ME_ABFG			Min	2		
3	StringLength			Exempt_to_3_ME_CDE			Min	3		
4	StringLength			MaineZoneA_East			Min	20		
5	StringLength			MaineZoneA_West_3_6			Min	8		
6	StringLength			Three_to_6_ME_B			Exactly	5		
7	MaxGearWSingleLine			Three_to_6_ME_B						5
8	StringLength			Three_to_6_ME_CDEFG			Min	10		
9	StringLength			MaineZoneA_West_6_12			Min	15		
10	StringLength			Six_to_12_ME_B			Min	10		
11	StringLength			Six_to_12_ME_CG			Min	20		
12	StringLength			Six_to_12_ME_DEF			Min	10		
13	StringLength	A1	MA	6to12_A1_poly			Min	15		
14	StringLength	OCC		3nmi_to_12nmi			Min	15		
15	StringLength	A1		12nmi_to_EEZ_Boundary			Min	25		
16	StringLength	A2_3overlap					Min	40		
17	StringLength	A3		LMA3_Canyons_Simple			Min	35		
18	StringLength	A3		LMA3_NorthOfCanyons_Simple			Min	45		
19	StringLength			Georges_Basin_Restricted_Area			Min	50		
20	Closure			LMA1_Restricted_Area	10,11,12,1					
21	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4					
22	GearReduction			Massachusetts_Restricted_Area	2,3,4	1				
23	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1				
24	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1				
25	GearReduction	A3				0.12				
26	GearReduction	A2_3overlap				0.15				
27	GearReduction	A2				0.18				
28	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.3243			1700	
29	MaxRopeStrength			Three_to_12_ME_AwBCDE		0.181			1700	
31	MaxRopeStrength	A1	ME	12nmi_to_EEZ_Boundary		0.0472			1700	
32	MaxRopeStrength	A1	MA	Coast_to_3nmi_DST		0.5			1700	
33	MaxRopeStrength	OCC		Coast_to_3nmi_DST		0.5			1700	
34	MaxRopeStrength	A2		Coast_to_3nmi_DST		0.5			1700	
35	MaxRopeStrength	A1	MA	3nmi_to_12nmi		0.2933			1700	
36	MaxRopeStrength	OCC		3nmi_to_12nmi		0.3907			1700	
37	MaxRopeStrength	A2		3nmi_to_12nmi		0.5			1700	
38	MaxRopeStrength	A1	MA	12nmi_to_EEZ_Boundary		0.0786			1700	
39	MaxRopeStrength	A2		12nmi_to_EEZ_Boundary		0.5			1700	
40	MaxRopeStrength	OCC		12nmi_to_EEZ_Boundary		0.2049			1700	
41	MaxRopeStrength	A2_3overlap				0.4375			1700	
42	MaxRopeStrength	A3				0.375			1700	

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	56.00	37.3 %
2	RelativeRisk_CoOccurrence	2	34.77	24.37	29.9 %
3	RelativeRisk_CoOccurrence	3	26.60	16.92	36.4 %
4	RelativeRisk_CoOccurrence	4	89.76	40.37	55 %
5	RelativeRisk_CoOccurrence	5	315.51	24.80	92.1 %
6	RelativeRisk_CoOccurrence	6	19.10	13.36	30 %
7	RelativeRisk_CoOccurrence	7	10.16	6.92	31.9 %
8	RelativeRisk_CoOccurrence	8	24.98	21.24	15 %
9	RelativeRisk_CoOccurrence	9	81.84	68.04	16.9 %
10	RelativeRisk_CoOccurrence	10	60.48	36.82	39.1 %
11	RelativeRisk_CoOccurrence	11	72.50	38.15	47.4 %
12	RelativeRisk_CoOccurrence	12	94.32	72.26	23.4 %
13	RelativeRisk_CoOccurrence	Total	919.35	419.26	54.4 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	8.73	46.4 %
2	RelativeRisk_Threat	2	8.05	3.77	53.1 %
3	RelativeRisk_Threat	3	6.63	2.62	60.5 %
4	RelativeRisk_Threat	4	16.96	5.90	65.2 %
5	RelativeRisk_Threat	5	38.50	4.06	89.4 %
6	RelativeRisk_Threat	6	4.66	2.39	48.8 %
7	RelativeRisk_Threat	7	2.63	1.32	50.1 %
8	RelativeRisk_Threat	8	2.52	1.94	22.9 %
9	RelativeRisk_Threat	9	8.20	6.24	23.9 %
10	RelativeRisk_Threat	10	7.66	4.43	42.1 %
11	RelativeRisk_Threat	11	9.96	4.95	50.3 %
12	RelativeRisk_Threat	12	14.02	8.46	39.6 %
13	RelativeRisk_Threat	Total	136.10	54.82	59.7 %

3.2.7 FEIS Preferred Alternative: Humpback Whales

The lower bound of the Preferred Alternative (Alternative 2) without the Massachusetts Restricted Area credit for humpback whales 1999-2017

	ModelConfiguration
1	2021−04−24 13:20:30
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative_hb.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_HumpbackWhaleModel_v10_DSTv3.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength	MaxGearSnglLn
1	Constraint_Spatial			NE_TrapPot_2020FEIS						
2	StringLength			Exempt_to_3_ME_ABFG			Min	2		
3	StringLength			Exempt_to_3_ME_CDE			Min	3		
4	StringLength			MaineZoneA_East			Min	20		
5	StringLength			MaineZoneA_West_3_6			Min	8		
6	StringLength			Three_to_6_ME_B			Exactly	5		
7	MaxGearWSingleLine			Three_to_6_ME_B						5
8	StringLength			Three_to_6_ME_CDEFG			Min	10		
9	StringLength			MaineZoneA_West_6_12			Min	15		
10	StringLength			Six_to_12_ME_B			Min	10		
11	StringLength			Six_to_12_ME_CG			Min	20		
12	StringLength			Six_to_12_ME_DEF			Min	10		
13	StringLength	A1	MA	6to12_A1_poly			Min	15		
14	StringLength	OCC		3nmi_to_12nmi			Min	15		
15	StringLength	A1		12nmi_to_EEZ_Boundary			Min	25		
16	StringLength	A2_3overlap					Min	40		
17	StringLength	A3		LMA3_Canyons_Simple			Min	35		
18	StringLength	A3		LMA3_NorthOfCanyons_Simple			Min	45		
19	StringLength			Georges_Basin_Restricted_Area			Min	50		
20	Closure			LMA1_Restricted_Area	10,11,12,1					
21	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4					
22	GearReduction			Massachusetts_Restricted_Area	2,3,4	1				
23	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1				
24	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1				
25	GearReduction	A3				0.12				
26	GearReduction	A2_3overlap				0.15				
27	GearReduction	A2				0.18				
28	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.3243			1700	
29	MaxRopeStrength			Three_to_12_ME_AwBCDE		0.181			1700	
30	MaxRopeStrength			Three_to_12_ME_AeFG		0.1015			1700	

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	391.18	348.50	10.9 %
2	RelativeRisk_CoOccurrence	2	112.77	96.65	14.3 %
3	RelativeRisk_CoOccurrence	3	111.16	92.52	16.8 %
4	RelativeRisk_CoOccurrence	4	501.91	410.21	18.3 %
5	RelativeRisk_CoOccurrence	5	3,402.72	2,799.10	17.7 %
6	RelativeRisk_CoOccurrence	6	3,133.56	2,733.33	12.8 %
7	RelativeRisk_CoOccurrence	7	3,255.43	2,822.27	13.3 %
8	RelativeRisk_CoOccurrence	8	3,157.12	2,796.92	11.4 %
9	RelativeRisk_CoOccurrence	9	5,806.53	5,208.54	10.3 %
10	RelativeRisk_CoOccurrence	10	5,392.10	4,876.40	9.6 %
11	RelativeRisk_CoOccurrence	11	2,187.84	1,955.67	10.6 %
12	RelativeRisk_CoOccurrence	12	2,324.40	2,078.76	10.6 %
13	RelativeRisk_CoOccurrence	Total	29,776.73	26,218.87	11.9 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	42.66	34.83	18.4 %
2	RelativeRisk_Threat	2	12.59	9.79	22.3 %
3	RelativeRisk_Threat	3	12.66	9.55	24.5 %
4	RelativeRisk_Threat	4	57.62	42.24	26.7 %
5	RelativeRisk_Threat	5	357.03	268.49	24.8 %
6	RelativeRisk_Threat	6	341.44	267.49	21.7 %
7	RelativeRisk_Threat	7	342.70	266.83	22.1 %
8	RelativeRisk_Threat	8	332.09	262.53	20.9 %
9	RelativeRisk_Threat	9	593.82	481.22	19 %
10	RelativeRisk_Threat	10	558.11	455.47	18.4 %
11	RelativeRisk_Threat	11	245.78	197.37	19.7 %
12	RelativeRisk_Threat	12	236.13	191.52	18.9 %
13	RelativeRisk_Threat	Total	3,132.63	2,487.34	20.6 %

3.2.8 FEIS Preferred Alternative: Finback Whales

The lower bound of the Preferred Alternative (Alternative 2) without the Massachusetts Restricted Area credit for finback whales 1999-2017 (co-occurrence only).

	ModelConfiguration
1	2021−04−24 15:39:14
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_Preferred_Alternative_fb.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_FinWhaleModel_v11.Rdata
11	
12	Comment:
13	CoOccurrence: TRUE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Model inputs

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength	MaxGearSnglLn
1	Constraint_Spatial			NE_TrapPot_2020FEIS						
2	StringLength			Exempt_to_3_ME_ABFG			Min	2		
3	StringLength			Exempt_to_3_ME_CDE			Min	3		
4	StringLength			MaineZoneA_East			Min	20		
5	StringLength			MaineZoneA_West_3_6			Min	8		
6	StringLength			Three_to_6_ME_B			Exactly	5		
7	MaxGearWSingleLine			Three_to_6_ME_B						5
8	StringLength			Three_to_6_ME_CDEFG			Min	10		
9	StringLength			MaineZoneA_West_6_12			Min	15		
10	StringLength			Six_to_12_ME_B			Min	10		
11	StringLength			Six_to_12_ME_CG			Min	20		
12	StringLength			Six_to_12_ME_DEF			Min	10		
13	StringLength	A1	MA	6to12_A1_poly			Min	15		
14	StringLength	OCC		3nmi_to_12nmi			Min	15		
15	StringLength	A1		12nmi_to_EEZ_Boundary			Min	25		
16	StringLength	A2_3overlap					Min	40		
17	StringLength	A3		LMA3_Canyons_Simple			Min	35		
18	StringLength	A3		LMA3_NorthOfCanyons_Simple			Min	45		
19	StringLength			Georges_Basin_Restricted_Area			Min	50		
20	Closure			LMA1_Restricted_Area	10,11,12,1					
21	Closure			South_Island_Restricted_Area_NonPreferred_A	2,3,4					
22	GearReduction			Massachusetts_Restricted_Area	2,3,4	1				
23	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1				
24	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1				
25	GearReduction	A3				0.12				
26	GearReduction	A2_3overlap				0.15				
27	GearReduction	A2				0.18				
28	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.3243			1700	
29	MaxRopeStrength			Three_to_12_ME_AwBCDE		0.181			1700	
30	MaxRopeStrength			Three_to_12_ME_AeFG		0.1015			1700	
31	MaxRopeStrength	A1	ME	12nmi_to_EEZ_Boundary		0.0472			1700	
32	MaxRopeStrength	A1	MA	Coast_to_3nmi_DST		0.5			1700	
33	MaxRopeStrength	OCC		Coast_to_3nmi_DST		0.5			1700	
34	MaxRopeStrength	A2		Coast_to_3nmi_DST		0.5			1700	
35	MaxRopeStrength	A1	MA	3nmi_to_12nmi		0.2933			1700	
36	MaxRopeStrength	OCC		3nmi_to_12nmi		0.3907			1700	
37	MaxRopeStrength	A2		3nmi_to_12nmi		0.5			1700	
38	MaxRopeStrength	A1	MA	12nmi_to_EEZ_Boundary		0.0786			1700	
39	MaxRopeStrength	A2		12nmi_to_EEZ_Boundary		0.5			1700	
40	MaxRopeStrength	OCC		12nmi_to_EEZ_Boundary		0.2049			1700	
41	MaxRopeStrength	A2_3overlap				0.4375			1700	
42	MaxRopeStrength	A3				0.375			1700	

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	964.38	822.13	14.8 %
2	RelativeRisk_CoOccurrence	2	478.85	395.09	17.5 %
3	RelativeRisk_CoOccurrence	3	455.23	370.12	18.7 %
4	RelativeRisk_CoOccurrence	4	1,190.17	948.59	20.3 %
5	RelativeRisk_CoOccurrence	5	3,352.16	2,703.56	19.3 %
6	RelativeRisk_CoOccurrence	6	4,451.95	3,858.23	13.3 %
7	RelativeRisk_CoOccurrence	7	5,306.80	4,633.23	12.7 %
8	RelativeRisk_CoOccurrence	8	5,570.69	4,924.79	11.6 %
9	RelativeRisk_CoOccurrence	9	5,137.67	4,479.81	12.8 %
10	RelativeRisk_CoOccurrence	10	4,726.30	4,128.30	12.7 %
11	RelativeRisk_CoOccurrence	11	3,487.23	3,042.40	12.8 %
12	RelativeRisk_CoOccurrence	12	1,832.10	1,592.88	13.1 %
13	RelativeRisk_CoOccurrence	Total	36,953.53	31,899.14	13.7 %

3.2.9 FEIS Non-Preferred Alternative

The estimate of the Non-preferred Alternative (Alternative 3) for right whales 2010 - 2018

	ModelConfiguration
1	2021−05−05 07:33:09
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_NonPreferred_Alternative.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength
1	Constraint_Spatial			NE_TrapPot_2020FEIS					
2	GearReduction	A3				0.49			
3	GearReduction	A2		3nmi_to_EEZ_Boundary		0.37			
4	GearReduction	A1	ME	3nmi_to_EEZ_Boundary		0.49			
5	GearReduction	OCC		3nmi_to_EEZ_Boundary		0.395			
6	GearReduction	A1	MA	3nmi_to_EEZ_Boundary		0.44			
7	GearReduction	A2_3overlap		3nmi_to_EEZ_Boundary		0.44			
8	GearReduction			Massachusetts_Restricted_Area	5	1			
9	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1			
10	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1			
11	StringLength	A3			5,6,7,8		Min	45	
12	Closure			South_Island_Restricted_Area_NonPreferred_B	2,3,4,5				
13	Closure			Georges_Basin_Restricted_Area	5,6,7,8				
14	MaxRopeStrength	A1	MA	Coast_to_3nmi_DST		0.5			1700
15	MaxRopeStrength	OCC		Coast_to_3nmi_DST		0.5			1700
16	MaxRopeStrength	A2		Coast_to_3nmi_DST		0.5			1700
17	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.75			1700
18	MaxRopeStrength	A1		3nmi_to_EEZ_Boundary		0.75			1700
19	MaxRopeStrength	OCC		3nmi_to_EEZ_Boundary		0.75			1700
20	MaxRopeStrength	A2		3nmi_to_EEZ_Boundary		0.75			1700
21	MaxRopeStrength	A2_3overlap			5,6,7,8	0.6125			1700
22	MaxRopeStrength	A2_3overlap			1,2,3,4,9,10,11,12	0.425			1700
23	MaxRopeStrength	A3			1,2,3,4,9,10,11,12	0.2			1700
24	MaxRopeStrength	A3			5,6,7,8	0.475			1700

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	54.33	39.2 %
2	RelativeRisk_CoOccurrence	2	34.77	19.02	45.3 %
3	RelativeRisk_CoOccurrence	3	26.60	12.95	51.3 %
4	RelativeRisk_CoOccurrence	4	89.76	29.78	66.8 %
5	RelativeRisk_CoOccurrence	5	315.51	14.69	95.3 %
6	RelativeRisk_CoOccurrence	6	19.10	7.17	62.4 %
7	RelativeRisk_CoOccurrence	7	10.16	3.00	70.5 %
8	RelativeRisk_CoOccurrence	8	24.98	19.40	22.3 %
9	RelativeRisk_CoOccurrence	9	81.84	62.83	23.2 %
10	RelativeRisk_CoOccurrence	10	60.48	33.66	44.3 %
11	RelativeRisk_CoOccurrence	11	72.50	39.47	45.6 %
12	RelativeRisk_CoOccurrence	12	94.32	72.68	22.9 %
13	RelativeRisk_CoOccurrence	Total	919.35	368.98	59.9 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	6.32	61.2 %
2	RelativeRisk_Threat	2	8.05	2.73	66.1 %
3	RelativeRisk_Threat	3	6.63	2.04	69.3 %
4	RelativeRisk_Threat	4	16.96	3.55	79.1 %
5	RelativeRisk_Threat	5	38.50	1.72	95.5 %
6	RelativeRisk_Threat	6	4.66	0.96	79.5 %
7	RelativeRisk_Threat	7	2.63	0.44	83.5 %
8	RelativeRisk_Threat	8	2.52	1.44	42.7 %
9	RelativeRisk_Threat	9	8.20	4.70	42.8 %
10	RelativeRisk_Threat	10	7.66	2.79	63.6 %
11	RelativeRisk_Threat	11	9.96	3.48	65.1 %
12	RelativeRisk_Threat	12	14.02	7.32	47.8 %
13	RelativeRisk_Threat	Total	136.10	37.47	72.5 %

3.2.10 FEIS Non-Preferred Alternative: Restricted Areas

The estimate of the restricted areas in the Non-preferred Alternative (Alternative 3) for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−23 01:42:37
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_NonPreferred_Alternative_RA.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage
1	Constraint_Spatial			NE_TrapPot_2020FEIS		
2	GearReduction			Massachusetts_Restricted_Area	5	1
3	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1
4	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1
5	Closure			South_Island_Restricted_Area_NonPreferred_B	2,3,4,5	
6	Closure			Georges_Basin_Restricted_Area	5,6,7,8	

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	89.33	0 %
2	RelativeRisk_CoOccurrence	2	34.77	33.22	4.5 %
3	RelativeRisk_CoOccurrence	3	26.60	21.23	20.2 %
4	RelativeRisk_CoOccurrence	4	89.76	48.05	46.5 %
5	RelativeRisk_CoOccurrence	5	315.51	25.65	91.9 %
6	RelativeRisk_CoOccurrence	6	19.10	14.07	26.4 %
7	RelativeRisk_CoOccurrence	7	10.16	6.38	37.2 %
8	RelativeRisk_CoOccurrence	8	24.98	24.98	0 %
9	RelativeRisk_CoOccurrence	9	81.84	81.84	0 %
10	RelativeRisk_CoOccurrence	10	60.48	60.48	0 %
11	RelativeRisk_CoOccurrence	11	72.50	72.50	0 %
12	RelativeRisk_CoOccurrence	12	94.32	94.32	0 %
13	RelativeRisk_CoOccurrence	Total	919.35	572.04	37.8 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	16.30	0 %
2	RelativeRisk_Threat	2	8.05	7.20	10.5 %
3	RelativeRisk_Threat	3	6.63	5.22	21.2 %
4	RelativeRisk_Threat	4	16.96	9.63	43.2 %
5	RelativeRisk_Threat	5	38.50	4.96	87.1 %
6	RelativeRisk_Threat	6	4.66	3.17	32 %
7	RelativeRisk_Threat	7	2.63	1.54	41.5 %
8	RelativeRisk_Threat	8	2.52	2.52	0.1 %
9	RelativeRisk_Threat	9	8.20	8.20	0 %
10	RelativeRisk_Threat	10	7.66	7.66	0 %
11	RelativeRisk_Threat	11	9.96	9.96	0 %
12	RelativeRisk_Threat	12	14.02	14.02	0 %
13	RelativeRisk_Threat	Total	136.10	90.38	33.6 %

3.2.11 FEIS Non-Preferred Alternative: Restricted Areas and Trawl Length Measures

The estimate of the restricted areas and trawl length measures in the Non-preferred Alternative (Alternative 3) for right whales 2010 - 2018

	ModelConfiguration
1	2021−04−23 00:03:41
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_NonPreferred_Alternative_RA_TU.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen
1	Constraint_Spatial			NE_TrapPot_2020FEIS				
2	GearReduction			Massachusetts_Restricted_Area	5	1		
3	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1		
4	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1		
5	StringLength	A3			5,6,7,8		Min	45
6	Closure			South_Island_Restricted_Area_NonPreferred_B	2,3,4,5			
7	Closure			Georges_Basin_Restricted_Area	5,6,7,8			

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	89.33	0 %
2	RelativeRisk_CoOccurrence	2	34.77	33.22	4.5 %
3	RelativeRisk_CoOccurrence	3	26.60	21.23	20.2 %
4	RelativeRisk_CoOccurrence	4	89.76	48.05	46.5 %
5	RelativeRisk_CoOccurrence	5	315.51	24.08	92.4 %
6	RelativeRisk_CoOccurrence	6	19.10	12.13	36.5 %
7	RelativeRisk_CoOccurrence	7	10.16	5.44	46.4 %
8	RelativeRisk_CoOccurrence	8	24.98	24.95	0.1 %
9	RelativeRisk_CoOccurrence	9	81.84	81.84	0 %
10	RelativeRisk_CoOccurrence	10	60.48	60.48	0 %
11	RelativeRisk_CoOccurrence	11	72.50	72.50	0 %
12	RelativeRisk_CoOccurrence	12	94.32	94.32	0 %
13	RelativeRisk_CoOccurrence	Total	919.35	567.58	38.3 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	16.30	0 %
2	RelativeRisk_Threat	2	8.05	7.20	10.5 %
3	RelativeRisk_Threat	3	6.63	5.22	21.2 %
4	RelativeRisk_Threat	4	16.96	9.63	43.2 %
5	RelativeRisk_Threat	5	38.50	4.55	88.2 %
6	RelativeRisk_Threat	6	4.66	2.67	42.7 %
7	RelativeRisk_Threat	7	2.63	1.29	51.1 %
8	RelativeRisk_Threat	8	2.52	2.51	0.3 %
9	RelativeRisk_Threat	9	8.20	8.20	0 %
10	RelativeRisk_Threat	10	7.66	7.66	0 %
11	RelativeRisk_Threat	11	9.96	9.96	0 %
12	RelativeRisk_Threat	12	14.02	14.02	0 %
13	RelativeRisk_Threat	Total	136.10	89.22	34.4 %

3.2.12 FEIS Non-Preferred Alternative: Restricted Areas, Trawl Length, and Line Cap Measures

The estimate of the restricted areas, trawl length, and line cap measures in the Non-preferred Alternative (Alternative 3) for right whales 2010 - 2018

	ModelConfiguration
1	2021−05−05 05:50:48
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: FEIS_NonPreferred_Alternative_RA_TU_LR.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_RightWhaleModel_v11_1018.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen
1	Constraint_Spatial			NE_TrapPot_2020FEIS				
2	GearReduction	A3				0.49		
3	GearReduction	A2		3nmi_to_EEZ_Boundary		0.37		
4	GearReduction	A1	ME	3nmi_to_EEZ_Boundary		0.49		
5	GearReduction	OCC		3nmi_to_EEZ_Boundary		0.395		
6	GearReduction	A1	MA	3nmi_to_EEZ_Boundary		0.44		
7	GearReduction	A2_3overlap		3nmi_to_EEZ_Boundary		0.44		
8	GearReduction			Massachusetts_Restricted_Area	5	1		
9	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1		
10	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1		
11	StringLength	A3			5,6,7,8		Min	45
12	Closure			South_Island_Restricted_Area_NonPreferred_B	2,3,4,5			
13	Closure			Georges_Basin_Restricted_Area	5,6,7,8			

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	89.33	54.33	39.2 %
2	RelativeRisk_CoOccurrence	2	34.77	19.02	45.3 %
3	RelativeRisk_CoOccurrence	3	26.60	12.95	51.3 %
4	RelativeRisk_CoOccurrence	4	89.76	29.78	66.8 %
5	RelativeRisk_CoOccurrence	5	315.51	14.69	95.3 %
6	RelativeRisk_CoOccurrence	6	19.10	7.17	62.4 %
7	RelativeRisk_CoOccurrence	7	10.16	3.00	70.5 %
8	RelativeRisk_CoOccurrence	8	24.98	19.40	22.3 %
9	RelativeRisk_CoOccurrence	9	81.84	62.83	23.2 %
10	RelativeRisk_CoOccurrence	10	60.48	33.66	44.3 %
11	RelativeRisk_CoOccurrence	11	72.50	39.47	45.6 %
12	RelativeRisk_CoOccurrence	12	94.32	72.68	22.9 %
13	RelativeRisk_CoOccurrence	Total	919.35	368.98	59.9 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	16.30	9.80	39.9 %
2	RelativeRisk_Threat	2	8.05	4.03	49.9 %
3	RelativeRisk_Threat	3	6.63	3.03	54.3 %
4	RelativeRisk_Threat	4	16.96	5.72	66.3 %
5	RelativeRisk_Threat	5	38.50	2.64	93.1 %
6	RelativeRisk_Threat	6	4.66	1.48	68.3 %
7	RelativeRisk_Threat	7	2.63	0.69	74 %
8	RelativeRisk_Threat	8	2.52	1.88	25.3 %
9	RelativeRisk_Threat	9	8.20	6.10	25.7 %
10	RelativeRisk_Threat	10	7.66	4.17	45.6 %
11	RelativeRisk_Threat	11	9.96	5.35	46.3 %
12	RelativeRisk_Threat	12	14.02	10.34	26.2 %
13	RelativeRisk_Threat	Total	136.10	55.22	59.4 %

3.2.13 FEIS Non-Preferred Alternative: Humpback Whales

The estimate of the Non-preferred Alternative (Alternative 3) for humpback whales 1999-2017

	ModelConfiguration
1	2021−05−03 22:19:08
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: MarisasSubfolder/FEIS_NonPreferred_Alternative_hb.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_HumpbackWhaleModel_v10_DSTv3.Rdata
11	
12	Comment:
13	CoOccurrence: FALSE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength
1	Constraint_Spatial			NE_TrapPot_2020FEIS					
2	GearReduction	A3				0.49			
3	GearReduction	A2		3nmi_to_EEZ_Boundary		0.37			
4	GearReduction	A1	ME	3nmi_to_EEZ_Boundary		0.49			
5	GearReduction	A1	MA	3nmi_to_EEZ_Boundary		0.44			
6	GearReduction	A2_3overlap		3nmi_to_EEZ_Boundary		0.44			
7	GearReduction			Massachusetts_Restricted_Area	5	1			
8	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1			
9	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1			
10	StringLength	A3			5,6,7,8		Min	45	
11	Closure			South_Island_Restricted_Area_NonPreferred_B	2,3,4,5				
12	Closure			Georges_Basin_Restricted_Area	5,6,7,8				
13	MaxRopeStrength	A1	MA	Coast_to_3nmi_DST		0.5			1700
14	MaxRopeStrength	OCC		Coast_to_3nmi_DST		0.5			1700
15	MaxRopeStrength	A2		Coast_to_3nmi_DST		0.5			1700
16	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.75			1700
17	MaxRopeStrength	A1		3nmi_to_EEZ_Boundary		0.75			1700
18	MaxRopeStrength	OCC		3nmi_to_EEZ_Boundary		0.75			1700
19	MaxRopeStrength	A2		3nmi_to_EEZ_Boundary		0.75			1700
20	MaxRopeStrength	A2_3overlap			5,6,7,8	0.6125			1700
21	MaxRopeStrength	A2_3overlap			1,2,3,4,9,10,11,12	0.425			1700
22	MaxRopeStrength	A3			1,2,3,4,9,10,11,12	0.2			1700
23	MaxRopeStrength	A3			5,6,7,8	0.475			1700

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	391.18	301.85	22.8 %
2	RelativeRisk_CoOccurrence	2	112.77	84.64	24.9 %
3	RelativeRisk_CoOccurrence	3	111.16	79.01	28.9 %
4	RelativeRisk_CoOccurrence	4	501.91	354.11	29.4 %
5	RelativeRisk_CoOccurrence	5	3,402.72	2,496.34	26.6 %
6	RelativeRisk_CoOccurrence	6	3,133.56	2,474.27	21 %
7	RelativeRisk_CoOccurrence	7	3,255.43	2,624.87	19.4 %
8	RelativeRisk_CoOccurrence	8	3,157.12	2,595.81	17.8 %
9	RelativeRisk_CoOccurrence	9	5,806.53	4,881.93	15.9 %
10	RelativeRisk_CoOccurrence	10	5,392.10	4,587.91	14.9 %
11	RelativeRisk_CoOccurrence	11	2,187.84	1,763.31	19.4 %
12	RelativeRisk_CoOccurrence	12	2,324.40	2,022.78	13 %
13	RelativeRisk_CoOccurrence	Total	29,776.73	24,266.83	18.5 %

Final Relative Risk Scores − Mean Threat

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_Threat	1	42.66	23.27	45.4 %
2	RelativeRisk_Threat	2	12.59	6.61	47.5 %
3	RelativeRisk_Threat	3	12.66	6.26	50.5 %
4	RelativeRisk_Threat	4	57.62	27.80	51.8 %
5	RelativeRisk_Threat	5	357.03	185.89	47.9 %
6	RelativeRisk_Threat	6	341.44	192.04	43.8 %
7	RelativeRisk_Threat	7	342.70	199.91	41.7 %
8	RelativeRisk_Threat	8	332.09	197.16	40.6 %
9	RelativeRisk_Threat	9	593.82	367.76	38.1 %
10	RelativeRisk_Threat	10	558.11	350.23	37.2 %
11	RelativeRisk_Threat	11	245.78	138.83	43.5 %
12	RelativeRisk_Threat	12	236.13	152.23	35.5 %
13	RelativeRisk_Threat	Total	3,132.63	1,847.99	41 %

3.2.14 FEIS Non-Preferred Alternative: Finback Whales

The estimate of the Non-preferred Alternative (Alternative 3) for finback whales 1999-2017 (co-occurrence only)

	ModelConfiguration
1	2021−05−05 11:22:14
2	Home Directory: //net/work4/LobsterGroup/Management/RightWhales/DecisionSupportTool
3	Model Version: DecisionSupportTool_V3.1.0_MT.R
4	Input Spreadsheet: MarisasSubfolder/FEIS_NonPreferred_Alternative_fb.csv
5	MapRefDomain: MapRef_HR_Lobster_V3.0.0.Rdata
6	GearMap: GearMap_Lobster_V3.0.0.Rdata
7	StringLengthModel: IncludedInGearMap
8	Rope Strength Model: LineStrengthModel_V2.1_60TrapThreshold.Rdata
9	Threat Model: ThreatMod_RW_Selectivity_Uncertainty.Rdata
10	Whale Model: Duke_FinWhaleModel_v11.Rdata
11	
12	Comment:
13	CoOccurrence: TRUE
14	Run Test Scenario: TRUE
15	AggregateStrings= TRUE
16	HighResolution= TRUE
17	RelocationCostExp: 1
18	ExpressRedistribution: TRUE
19	Update Endline Strengths: FALSE
20	RopeStrengthResolution: 500
21	
22	PrintTables= TRUE
23	PrintDefaultMaps= TRUE
24	PrintScenarioMaps= TRUE
25	PrintRedistributionMaps= TRUE
26	PrintMapsInHighResolution= TRUE
27	WriteMapSources= TRUE
28	WriteOutputCsv= TRUE
29	WriteDetailedOutput= TRUE
30	PrintSummary= TRUE
31	ArchiveInputSpreadsheet: FALSE

Input Scenario Spreadsheet

	Action	LMA	State	Shapefile	Months	Percentage	StringRegulation	StringLen	MaxRopeStrength
1	Constraint_Spatial			NE_TrapPot_2020FEIS					
2	GearReduction	A3				0.49			
3	GearReduction	A2		3nmi_to_EEZ_Boundary		0.37			
4	GearReduction	A1	ME	3nmi_to_EEZ_Boundary		0.49			
5	GearReduction	OCC		3nmi_to_EEZ_Boundary		0.395			
6	GearReduction	A1	MA	3nmi_to_EEZ_Boundary		0.44			
7	GearReduction	A2_3overlap		3nmi_to_EEZ_Boundary		0.44			
8	GearReduction			Massachusetts_Restricted_Area	5	1			
9	GearReduction	A1	MA	Coast_to_3nmi_DST	2,3,4,5	1			
10	GearReduction	OCC	MA	Coast_to_3nmi_DST	5	1			
11	StringLength	A3			5,6,7,8		Min	45	
12	Closure			South_Island_Restricted_Area_NonPreferred_B	2,3,4,5				
13	Closure			Georges_Basin_Restricted_Area	5,6,7,8				
14	MaxRopeStrength	A1	MA	Coast_to_3nmi_DST		0.5			1700
15	MaxRopeStrength	OCC		Coast_to_3nmi_DST		0.5			1700
16	MaxRopeStrength	A2		Coast_to_3nmi_DST		0.5			1700
17	MaxRopeStrength	A1	ME	Coast_to_3nmi_DST		0.75			1700
18	MaxRopeStrength	A1		3nmi_to_EEZ_Boundary		0.75			1700
19	MaxRopeStrength	OCC		3nmi_to_EEZ_Boundary		0.75			1700
20	MaxRopeStrength	A2		3nmi_to_EEZ_Boundary		0.75			1700
21	MaxRopeStrength	A2_3overlap			5,6,7,8	0.6125			1700
22	MaxRopeStrength	A2_3overlap			1,2,3,4,9,10,11,12	0.425			1700
23	MaxRopeStrength	A3			1,2,3,4,9,10,11,12	0.2			1700
24	MaxRopeStrength	A3			5,6,7,8	0.475			1700

Final Relative Risk Scores − CoOccurrence

	Variable	Month	Default	Scenario	Reduction
1	RelativeRisk_CoOccurrence	1	964.38	673.25	30.2 %
2	RelativeRisk_CoOccurrence	2	478.85	322.74	32.6 %
3	RelativeRisk_CoOccurrence	3	455.23	298.76	34.4 %
4	RelativeRisk_CoOccurrence	4	1,190.17	849.24	28.6 %
5	RelativeRisk_CoOccurrence	5	3,352.16	2,539.56	24.2 %
6	RelativeRisk_CoOccurrence	6	4,451.95	3,727.01	16.3 %
7	RelativeRisk_CoOccurrence	7	5,306.80	4,582.68	13.6 %
8	RelativeRisk_CoOccurrence	8	5,570.69	4,841.32	13.1 %
9	RelativeRisk_CoOccurrence	9	5,137.67	4,410.33	14.2 %
10	RelativeRisk_CoOccurrence	10	4,726.30	4,090.51	13.5 %
11	RelativeRisk_CoOccurrence	11	3,487.23	2,955.24	15.3 %
12	RelativeRisk_CoOccurrence	12	1,832.10	1,454.31	20.6 %
13	RelativeRisk_CoOccurrence	Total	36,953.53	30,744.95	16.8 %

Appendix 3.3 All State Proposals

3.3.1 Maine DMR Proposal

STATE OF MAINE
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December 27, 2019

Michael Pentony Regional Administrator
National Marine Fisheries Service 55 Great Republic Drive Gloucester, Massachusetts 01930

Dear Mr. Pentony

The Maine Department of Marine Resources (ME DMR) submits to NOAA Fisheries its proposal for regulatory changes to the Atlantic Large Whale Take Reduction Plan (ALWTRP). This proposal is in response to the finding that the removal of North Atlantic right whales is above the Potential Biological Removal established in the Marine Mammal Protection Act (MMPA). The document includes proposed regulatory modifications to the Maine lobster fishery.

The attached proposal was developed by ME DMR staff, with input from industry. It focuses regulatory change on areas where right whales are most likely to be present in Maine's coastal waters, with the goal of achieving protective measures where they are needed most and would be the most effective. It also balances this conservation with the safety concerns highlighted by industry and the economic viability of the lobster fishery. As stated at NOAA Fisheries' scoping meetings, the lobster fishery is the economic and social cornerstone of Maine's coastal and island communities. It includes not only license holders but crew, lobster dealers, processors, distributors, and a multitude of associated restaurant and tourism industries. This fishery has been a model of conservation, not only in the management of the lobster resource, but also in its two-decade participation in regulations aimed at protecting large whales. In fact, a right whale entanglement has not been directly linked to the Maine lobster fishery in well over a decade.

ME DMR's proposal is comprised of several components. They include reductions in the number of vertical lines, weakening of remaining vertical lines, increased gear marking, and increased harvester reporting. There is also a discussion regarding the enforcement benefits and potential impacts of tracking on federally permitted vessels. In combination, these measures not only minimize the risk of serious injury and mortality which may result from an entanglement but also reduce the potential of an entanglement occurring. Further, these measures improve the effort and location data collected by the Maine lobster fishery. Our hope is that, if future conversations are needed, an improved data set will enable measures to be targeted to fisheries and regions with high right whale densities and known entanglements. The proposal also includes a provision for conservation equivalency so that regional differences in fishing practices and oceanographic conditions can be considered. This level of flexibility is critical so that safety issues not addressed in the state-wide approach can be ameliorated prior to implementation.

In addition, this proposal outlines several concerns that ME DMR has had with the ALWTRT process, the development of supporting analyses, and the timing of pending management versus needed scientific data. These concerns have prompted the Department to develop its own supporting analyses given a completed model was not available at the time of proposal submission. Given management measures related to the protection of right whales are generally reviewed on a five-year schedule, my hope in raising these issues is to ensure the process can be improved for the future.

I am confident the measures outlined in this proposal provide significantly greater protection to right whales transiting through the Gulf of Maine. As such, we request NOAA Fisheries include these measures as preferred alternatives in the upcoming proposed rule.

ME DMR remains committed to working with NOAA during the upcoming regulatory process. If you have any questions, please do not hesitate to reach out.

Sincerely,

Commissioner

Maine Department of Marine Resources’ Proposal to Amend the Atlantic Large Whale Take Reduction Plan

The following proposal includes a series of measures intended to prevent right whale serious injury and mortality, and to reduce the presumed risk of entanglement posed by the Maine lobster fishery. The proposal was developed after thorough analyses regarding the location of right whales in the Gulf of Maine, the location of Maine lobster gear, the relative threat of different gear configurations, and the risk reduction associated with various management tools. Development of the proposal also considered several important criteria including safety of fishermen, feasibility, enforceability, and economic impacts to the fishery.

ME DMR has been an active participant on the Atlantic Large Whale Take Reduction Team (ALWTRT) and has routinely worked with state and federal partners to better the science and data needed to support this group’s discussions. We are committed to solving issues regarding the endangered status of right whales and recognize that the ALWTRT process allows for input from multiple caucuses, including fishermen, Non-Governmental Organizations, and state agencies. While at the April 2019 meeting ME DMR supported the preliminary recommendations put forth by the ALWTRT, the Department also reserved its right to disagree with this recommendation in the future, pending analysis to determine what a 50% vertical line reduction meant in practice and to consider new, changing, or emerging data. After conducting this analysis, it became clear a 50% vertical line reduction placed the largest portion of the burden on the fishery within Maine’s exemption line – an area NOAA found, based on scientific data, that endangered large whales rarely venture.[1] This large burden in exempted waters resulted because roughly 70% of vertical lines associated with the lobster fishery in Maine state waters are located within Maine’s exemption line. Consequently, an overall 50% vertical line reduction forced drastic measures primarily in areas where whales do not frequent. This would have resulted in large economic hardship for inshore fishermen, a reduction in the diversity of the Maine lobster fleet, and minimal benefits to right whales.

Given this information, ME DMR completed its own analysis, using many of the same data inputs as NOAA Fisheries, to understand Maine’s ‘risk’ resulting from the overlap between the Maine lobster fishery and the transiting of right whales through the Gulf of Maine. The results showed the risk in Maine waters increases with distance from shore, with the majority of Maine’s risk occurring outside the 12-mile line. Thus, this proposal focuses measures in federal waters.

This proposal includes management measures and data collection tools. Many of the measures are differentiated by distance from shore given Maine’s expansive coast and vast regional differences. Detailed explanations of these measures are provided in the sections that follow. A cornerstone of ME DMR’s proposal is the request for conservation equivalency and an individual safety program. This flexibility is needed to address significant regional differences such as traditional fishing practices, tides, and vessel traffic.

[1] 72 Fed. Reg. 57104, 57162 (Response to comment 337)

Without this management flexibility, future rules will fail to take into account the diversity of Maine's lobster fleet and differing oceanographic conditions within the Gulf of Maine.

This proposal does not include any trap reductions or area closures. As outlined in ME DMR's September 2019 scoping comments (Appendix IV), both trap reductions and area closures present several concerns in Maine. Because there are often multiple traps fished on a single endline or trawl, a practice known as trawling up, trap reductions do not decrease vertical lines on a one-to-one basis. This means substantial trap reductions are needed to see a modest reduction in the number of vertical lines, prompting serious economic consequences. For area closures, their efficacy is based on the assumption that gear is brought to shore. However, the year-round nature of the offshore lobster fishery makes it unlikely this assumption would be met. Instead, it is more likely gear would be moved to adjacent fishing grounds yielding denser aggregations of gear around areas intended to protect whales. Or, risk associated with the gear could simply be shifted to another location.

ME DMR identified several challenges with the decision support tool presented to the ALWTRT. These challenges included incomplete analysis, particularly in regard to the gear threat score, and frequently changing risk reduction percentages as methodologies and data inputs changed. As a result, the Department developed its own tool (Appendix I) to calculate the risk reduction gained using certain management measures. Section B in this document describes the challenges that prompted ME DMR to develop its own tool, as well as concerns with the overall process, in greater detail.

A. Background on the Maine Lobster Fishery and Regulations To-Date

American lobster is the most valuable single species landed in the U.S. The Maine lobster fishery is a critical component of the State's economy and culture. Since the early 2000's, landings in the lobster fishery have exponentially increased from roughly 57.2 million pounds in 2000 to a high of 132.6 million pounds in 2016.[2] In 2018, 121.3 million pounds of lobster were landed in Maine, representing an ex-vessel value of $491 million dollars.[3] These 2018 landings represented 82% of the total lobster landings in the U.S.[4]

The fishery encompasses roughly 4,800 lobster license holders and 1,100 student license holders. Underscoring the importance of commercial fishing to Maine is the most recent data from the Atlantic Coastal Cooperative Statistics Program which reveals that Maine commercial harvesters took more than twice the number of commercial fishing trips than any other state on the east coast. In 2017, Maine harvesters reported 447,523 trips while harvesters from Virginia, the next highest state, reported just 217,940.[5] Importantly, participation in the lobster fishery is much greater, as is its value to Maine's coastal economy. Many individuals who do not have a lobster license are an integral part of the fishery's operations, including dealers, processors, sternmen, bait dealers, trap builders, and boat mechanics. Many more participate in the logistics and tourism businesses associated

[2] ME DMR landings data: https://www.maine.gov/dmr/commercial-fishing/landings/documents/lobster.table.pdf
[3] ACCSP Data Warehouse. Data pull on 12/23/19. [4] ACCSP Data Warehouse. Data pull on 12/23/19. [5] ACCSP Data Warehouse. Data pull on 12/11/19.

with the lobster industry. In fact, a recent economic study concluded the Maine lobster supply chain has an economic impact to the state of $1 billion annually.[6] Maine's coastal communities are particularly dependent on lobster fishing and related business due to low alternate wages and limited career options in those communities.[7]

ME DMR has actively contributed to the development and implementation of protective measures for right whales and has a history of expanding federal measures beyond the minimum federal requirements. Since the establishment of the ALWTRP, ME DMR has implemented 600 lbs weak links on buoy lines to ensure low breaking strengths, gear markings to identify trap/pot gear, sinking groundline to reduce entanglements, and trawling-up requirements to reduce the number of vertical lines in the fishery. ME DMR has also expanded many of these requirements to areas exempted from the federal ALWTRP. For example, ME DMR prohibits float rope on the surface for all lobster pot gear, including gear fished inside the exemption line. ME DMR has also been at the forefront of efforts to improve the spatial resolution of gear marking; the State has already adopted rules to implement new gear marking requirements which prescribe a Maine- specific purple gear mark, increase the frequency of markings on a rope, and expand gear marking requirements into exempted waters. These new regulations will be implemented in 2020, ahead of the federal regulatory process. Finally, Maine Marine Patrol and the Bureau of Marine Science collaborate with NOAA Fisheries, serving as primary regional responders to address whale entanglements on the Maine Coast. There are approximately 46 uniformed field personnel trained to a minimum of Level I that are capable of responding to entanglements for initial assessment and stand-by purposes. Nine officers and one Bureau of Marine Science staff have undergone apprentice training and hold their Level III authorizations under the Marine Mammal Health and Stranding Response Program's permit. This authorization designates the holder as a primary responder for disentanglement activities. As a part of the Atlantic Large Whale Disentanglement Network, ME DMR's primary responders work with NOAA Fisheries and other network members to engage in assessment, reporting, and response when reports of entanglements are received.

Many of the above regulations and activities have been adopted with minimal data linking the Maine lobster fishery to cases of right whale entanglement, particularly in the last decade. Since 2017, there have been thirty documented cases of right whale serious injury and mortality. None of these cases have been attributed to the Maine lobster fishery. In fact, entanglement records indicate the most recent known right whale entanglement in Maine lobster gear occurred fifteen years ago in 2004. Thus, the data from known entanglements suggest the Maine lobster fishery is not the primary source of right whale serious injury and mortality. The data also suggest previous regulations, particularly the implementation of sinking groundline which occurred in 2009, have been effective. In fact, since the sinking groundline rule went into place, there have been no right whale entanglements linked to groundlines from the US lobster fishery.

[6] Lobsters to Dollars: The Economic Impact of the Lobster Distribution Supply Chain in Maine by Michael Donihue, Colby College. June 2018.

[7] Gulf of Maine Research Institute. Understanding Opportunities and Barrier to Profitability in the New England Lobster Industry 13 (2014), https://www.gmri.org/sites/default/files/resource/gmri_ 2014_lobster_survey.pdf.

In contrast, there is a mounting level of evidence which indicates that other fisheries, particularly the Canadian snow crab fishery, and vessel strikes are contributing to an increasing portion of right whale serious injuries and mortalities. Of the thirty documented cases of right whale serious injury and mortality since 2017, twenty-one have occurred in Canada.[8] This includes nine cases of serious injury and mortality which occurred in 2019. Further, an additional two mortalities, which were first sighted in US waters, have been attributed to Canadian snow crab gear entanglements. Looking further back to 2012- 2016, the years used by NOAA to calculate a recommended risk reduction, one of the cases of serious injury and mortality attributed to a US fishery was the result of an entanglement with netting. Additionally, evidence suggests that vessel strikes are a significant contributor to right whale serious injury and mortality. Out of the thirty cases of serious injury and mortality since 2017, eight have been attributed to vessel strikes, including a case in US waters.

Information collected from right whale entanglements also indicates the vast majority of rope taken off of right whales is not indicative of the Maine lobster fishery. Based on a 2018 industry survey, ME DMR found the most prominent rope diameters used in the Maine lobster fishery are 3/8" rope followed by 7/16" rope (Appendix V). Results of the survey also showed that over 79% of rope used in the Maine lobster fishery is less than ½" in diameter. In contrast, entanglement records indicate that, between 2010 and 2018, 81% of all recovered rope taken off right whales was greater than ½" diameter.[9] This data further suggests that the Maine lobster fishery is not a primary contributor to right whale entanglements.

Right whale habitat use and residency times in historically known feeding habitats are also changing. Since 2010, right whale occurrence in the Gulf of Maine has declined.[10] A similar decrease of habitat use has also been documented across the same time frame in what had been critical late summer feeding habitat in the Bay of Fundy.[11] Hypotheses explaining this shift include large-scale changes in food supply, namely the copepod *Calanus finmarchicus*. A recent study supports this hypothesis by documenting an increase in the bottom temperature experienced in the basins within the eastern Gulf of Maine.[12] This ecosystem change is acting to drive down the availability of the calanus copepod in the Bay of Fundy and can potentially predict whether right whales will be seen there year to year. Other

[8] NOAA Fisheries. 2017-2019 North Atlantic Right Whale Unusual Mortality Event. https://www.fisheries.noaa.gov/national/marine-life-distress/2017-2019-north-atlantic-right-whale-unusual-mortality-event

[9] ALWTRT October 2018 Meeting. Presentation by GARFO Staff re: Line Diameter. https://archive.fisheries.noaa.gov/garfo/protected/whaletrp/trt/meetings/October%202018/eg_line_diameter.pdf

[10] Davis, G. E., Baumgartner, M. F., Bonnell, J. M., Bell, J., Berchok, C., Thorton, J. B., Brault, S., Buchanan, G., Charif, R. A., Cholewiak, D., Clark, C. W., Cockeron, P., Delarue, J., Dudzinski, K., Hatch, L., Hildebrand, J., Hodge, L., Klinck, H., Kraus, S., Martin, B., Mellinger, D. K., Moors-Murhpy, H., Nieukirk, S., Nowacek, D. P., Parks, S., Read, A. J., Rice, A. N., Risch, D., Sirovic, A., Soldevilla, M., Stafford, K., Stanistreet, J. E., Summers, E., Todd, S., Warde, A., and S. M. Van Parijs. 2017. Long-term passive acoustic recordings track the changing distribution of North Atlantic right whales (Eubalaena glacialis) from 2004 to 2014. Scientific Reports. 7:13460 (1-12).

[11] Davies K.T.A., Brown M.W., Hamilton P.K., Knowlton A.R., Taggart C.T., and A.S.M. Vanderlaan. 2019. Variation in North Atlantic right whale *Eubalaena glacialis* occurrence in the Bay of Fundy, Canada, over three decades. Endangered Species Research. 39:159-171.

[12] Record, N., Runge, J. A., Pendleton, D. E., Balch, W. M., Davies, K. T. A., Pershing, A. J., Johnson, C. L., Stamieszkin, K., Ji, R., Feng, Z., Kraus, S. D., Kenney, R. D., Hudak, C. A., Mayo, C. A., Chen, C., Salisbury, J. E., and C. R. S. Thompson. 2019. Rapid Climate-Driven Circulation Changes Threaten Conservation of Endangered North Atlantic Right Whales. *Oceanography,* 32, 2: 162-169.

feeding habitats, outside of the Gulf of Maine, have seen increases in use by right whales over the last decade. Cape Cod Bay and the surrounding waters in Massachusetts have seen an increase in individuals sighted or detected in this important early season feeding habitat.[13]

As the use of the Gulf of Maine as a summer feeding ground has decreased, sighting and acoustic surveys have documented a shift towards summertime use of the Gulf of St. Lawrence by right whales.[14] The shifts in habitat use documented above show a decreasing reliance on the Gulf of Maine as a feeding habitat for right whales. This is likely particularly true for waters very near to shore where most of the lobster fishery is executed. ME DMR again notes that the majority of Maine state waters, where most lobster permits are held, are exempted from the ALWTRP and outside designated right whale critical habitat. This spatial designation (e.g. the exemption line and critical habitat boundary) was based on the low number of right whale sightings as well as studies which show low concentrations of calanus which do not support the aggregation of right whales.[15]

B. Review of September 2018 – Present; Challenges and Concerns

ME DMR has been an engaged partner in the ALWTRT process since the group's inception. However, over the last few years, ME DMR has expressed concerns about the thoroughness of analyses being conducted, the availability of preparatory work prior to meetings, and the existence of new, changing, or emerging data. This has impacted ME DMR's ability to fully engage in the process and make informed decisions when developing this plan.

In September 2018, the Northeast Fisheries Science Center (NEFSC) released a technical memo entitled "*North Atlantic Right Whales – Evaluating Their Recovery Challenges in 2018*". While the title of the memo suggested the document would be a comprehensive review of many challenges facing right whales, the memo focused on a single fishery in a single region: the American lobster fishery in the Gulf of Maine. Throughout the memo, hypotheses were stated as fact, with inappropriate or no data to support the assumptions and conclusions. For example, the memo incorrectly suggested the 2015 vertical line regulations increased the strength of rope used, and therefore the severity of entanglements; however, the data provided to support this assumption included a paper which looked at data from 1994-2010, well before the regulatory change. Many of the datasets cited in the memo were inappropriate for the context, including the citation of an industry newsletter which approximated the number of traps fished. This figure was then used to inform an absolute

[13] Mayo C., Ganley L., Hudak C.A., Brault S., Marx M.K., Burke E., and M.W. Brown. 2018. Distribution, demography and behavior of North Atlantic right whales (*Eubalaena glacialis*) in Cape Cod Bay, Massachusetts 1998-2013. Marine Mammal Science. 34(4): 979-996; Charif R.A., Shiu Y., Muirhead C.A., Clark C.W., Parks S.E., and A.N. Rice. 2019. Phenological changes in North Atlantic right whale habitat use in Massachusetts Bay. Global Change Biology, 00:1-12. [14] Simard Y., Roy N., Giard S., Aulanier F. 2019. North Atlantic right whale shift to the Gulf of St. Lawrence in 2015, revealed by long-term passive acoustics. Endangered Species Research. 40: 271-284; DFO. 2019. Review of North Atlantic right whale occurrence and risk of entanglements in fishing gear and vessel strikes in Canadian waters. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2019/028.

[15] Taking of Marine Mammals Incidental to Commercial Fishing Operations; Atlantic Large Whale Take Reduction Plan Regulations, 72 Fed. Reg. 57103 (October 5, 2007); Endangered and Threatened Species; Critical Habitat for Endangered North Atlantic Right Whale, 81 Fed. Reg. 4837 (January 27, 2016).

number of traps in the memo. Many more statements were not cited. ME DMR communicated its serious concerns about the merit of this technical memo and its basis for the upcoming ALWTRT meeting in an October 2018 letter to the Director of the NEFSC (Appendix II). Unfortunately, despite ME DMR's concerns regarding the inaccuracies in the document, the Technical Memo remains published without substantial edits by the NEFSC and continues to be cited on NOAA's own website[16]. In fact, the only change made to the memo was the addition of the word "may" to a statement to indicate it is a hypothesis.

On April 5, 2019, less than three weeks before the ALWTRT meeting, NOAA released a statement indicating the agency would be seeking a risk reduction target of 60-80%. This announcement included minimal data to support its conclusions and, because it was distributed via email, did not provide an opportunity for questions and discussion. In response to numerous questions from the Maine Lobstermen's Association, a follow-up email from NOAA Fisheries staff was sent on April 18, 2019 which indicated other approaches were considered to calculate the risk reduction target; however, yet again, minimal rationale was provided for the method ultimately chosen. Of greatest concern to ME DMR was the assumption that 50% of unattributed cases of serious injury and mortality (SI&M) were the result of U.S. entanglements and 50% were the result of Canadian entanglements. This assumption did not match recent trends which show Canadian fisheries are responsible for an increasing portion of SI&M. Unfortunately, no time was set aside ahead of the April 2019 ALWTRT meeting to discuss these assumptions or the risk reduction target. At the April 2019 ALWTRT meeting, members were discouraged from discussing the risk reduction target given time constraints.

At the same time, NOAA announced weeks before the April 2019 ALWTRT meeting that it was developing a model, called the "decision support tool", to calculate risk reduction percentages achieved through various management tools. While ME DMR had no objection to this goal and fully supported additional modeling efforts to help inform the recommendations of the ALWTRT, ME DMR was concerned about the short timeframe for a model to be thoughtfully developed, tested, and reviewed. These concerns were realized on an April 16th webinar in which NEFSC staff walked through preliminary results of the model. First, ME DMR expressed concern about the components of the model. The severity score was based off a poll given to the ALWTRT members which was neither developed nor reviewed by a social scientist or someone with direct expertise in survey methodology. In addition, there was a clear incentive for ALWTRT members to inflate or deflate gear severity scores given the data would directly impact management recommendations.
Unsurprisingly, ALWTRT members voted along caucus lines resulting in a wide range of scores for most gear configurations. Sensitivity analyses run by ALWTRT members during the April 2019 meeting confirmed the results from the tool were highly dependent on the gear severity scores derived from the poll. Additionally, the whale habitat component of the model raised concerns as it lacked key data components including the most recent standardized whale surveys, and available information from alternative sighting sources and acoustic deployments. It also had low effort in inshore Gulf of Maine where the bulk of the lobster fishery is promulgated. As a result, recent changes in right whale distribution were

[16] https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/right-whales-and-entanglements- more-how-noaa

not reflected in the data outputs, whale distribution data were 'stretched' within the exemption line, and there was a high level of uncertainty where the majority of vertical lines are deployed.

The compilation of these concerns resulted in puzzling risk reduction model results. While areas south of Nantucket, where right whales are known to visit but fishing effort is low, were given low risk scores, areas of inshore Gulf of Maine, where fishing effort is high but right whales are extremely infrequent, were given high risk scores. This result did not match NOAA's stated intention of identifying overlapping areas of high gear density and frequent whale presence. In the end, the risk reduction model used at the ALWTRT meeting was not a finished product; data inputs were not finalized, the code was not perfected, and the model was not peer-reviewed. In fact, the model crashed during a Maine break-out session at the meeting when the Maine delegation tried to look at measures differentiated by distance from shore. The suite of ME DMR's concerns regarding the risk reduction target and the decision support tool were outlined in a letter to the Regional Administrator dated April 19, 2019 (Appendix III).

Since the April 2019 ALWTRT meeting, ME DMR has struggled to develop a proposal due to instability in the risk reduction percentages achieved by various management measures. In April 2019, calculations from the decision support tool showed vertical line reductions received, by far, the highest percent risk reduction of the measures considered. This output was used to derive Maine's preliminary plan. However, since the April 2019 ALWTRT meeting, changes have been made, and continue to be made, to the model in response to the concern expressed by many ALWTRT members, and to changing and emerging data. While ME DMR is appreciative that NEFSC staff continue to develop and improve the decision support tool, the modifications have resulted in frequent changes to the risk reduction percentages associated with various management options. These percentages continue to change as of the writing of this proposal. Most notably, the risk reduction percentage associated with the implementation of rope which breaks at 1,700 lbs has significantly increased relative to percentages given at the ALWTRT meeting. These changes in the risk reduction percentages have not been communicated to the broader ALWTRT.

Further, the November 2019 Peer Review of the decision support tool highlighted that many of the concerns raised in ME DMR's April 2019 letter to NOAA have not been addressed. ME DMR staff attended the Peer Review in hopes of learning more about the model since no documentation has been shared with the ALWTRT. Unfortunately, it became clear from the meeting that several components of the model were not finalized. Specifically, the updated whale habitat data, which is critical to understanding the new migration patterns of right whales, is delayed and was not available for the peer review.

Further, a substitute for the gear severity poll had not yet been developed or tested. In fact, a potential new gear severity score presented on the last day of the Peer Review showed confounding results in which the highest gear severity in Maine was calculated to be in a lobster zone with the fewest participants and the lowest trap allocation. As a result, it was clear that significant work was still needed on the decision support tool. Further, ME DMR was concerned to hear that, for some portions of the offshore lobster fishery, catch was being used as a proxy to estimate the number of vertical lines. While ME DMR recognizes data on effort in the offshore lobster fishery is limited, we have repeatedly commented that it is inaccurate to assume an increase in landings is correlated to an equal increase in fishing effort (this proposal provides data regarding landings and effort on pages 14-16). This is particularly true given the exponential increase in the abundance of lobster within the Gulf of Maine/Georges Bank stock. As a result, the model is likely overestimating the number of vertical lines in the offshore lobster fishery given the increase in abundance, catch per trap, and landings.

As the decision support tool continues to be developed, it is unclear how the model results will be used in the upcoming proposed rule. While advancements are still needed on the decision support tool, the management process required to implement new ALWTRP regulations continues to move forward. As a result, there is a clear disconnect between the timeline for the science intended to support management and the implementation of new regulations. NOAA has previously acknowledged this discrepancy. During a meeting with NOAA on July 11, 2019, NOAA staff indicated the co-occurrence model, not the risk reduction model, would be used in the proposed rule. This was a significant departure from what ME DMR anticipated, particularly given the co-occurrence model was not discussed at the April 2019 ALWTRT meeting. Further, without a gear threat score, it is unclear how differences between gear configurations will be considered or how rope which breaks at 1700 lbs, a key component of the discussions at the April 2019 ALWTRT, will be evaluated. Most importantly, this change has not been communicated to the full ALWTRT.

Given uncertainty about ongoing and future changes to the decision support tool, the constantly changing percentages produced by a model which is being updated, the lack of clarity of how the decision support tool will be used in the proposed rule, and uncertainty about how the co-occurrence model will evaluate rope which breaks at 1700 lbs, ME DMR endeavored to produce its own analysis to determine the risk reduction associated with this proposal. This in-state analysis was conducted because a clear and stable alternative from NOAA was not available before this proposal was due. If ME DMR had not conducted its own analysis, it is unclear how the state would have calculated a risk reduction for various management options and engaged the industry when weighing the options. A description of ME DMR's analysis is included in Appendix I.

C. Elements of Maine's Proposal

I. Vertical Line Reductions

ME DMR proposes a vertical line reduction in the Maine lobster fishery, to be achieved through changes to the trawling up requirements. As noted in ME DMR's scoping comments to NOAA fisheries on September 16, 2019 (Appendix IV), the Department has pursued measures associated with trawling up because it appears to provide some of the strongest conservation benefits; it reduces the risk of SI&M under the MMPA and the risk of entanglement under the Endangered Species Act (ESA). The proposed trawling up requirements are separated by distance from shore in recognition of differing fishing practices between inshore and offshore fishermen, as well as the likelihood of right whale occurrence along Maine's coast the farther one gets from shore.

a. Shoreline to Exempted Waters Line (<1% of Maine's whale-days, see Appendix I)

Proposal: Status quo; maintain exempt status for all such waters.

Rationale: The addition of trawling-up regulations within Maine's exempted waters would result in significant safety concerns, reduce diversity in the fleet, and have negative economic impacts for the lobster fishery, while providing minimal, if any, protections for right whales. Established in 2007, the Maine exemption line designates inshore waters, including bays and rivers, where right whale sightings are extremely rare. It was created in recognition that additional regulations in these areas would not have a significant benefit to large whales.[17] As a result, past modifications to the ALWTRP have not included regulations in exempted waters.
The exemption line was subsequently used when denoting critical habitat as it concluded "late stage copepods in quantities sufficient to trigger right whale foraging are not present inshore of the Maine exemption line".[18] Sightings data corroborate the finding that right whales are extremely rare shoreward of the
exemption line. Recent data on changing and decreasing copepod abundance in the eastern Gulf of Maine further corroborates these findings.[19]

Establishing trawl minimums in exempted waters would also unnecessarily result in large economic impacts by increasing operating costs and lowering the efficiency of inshore fishermen. The majority of the Maine lobster fishery's catch and effort occurs in state waters (shoreline to 3-mile limit). In 2016, 68% of landings and 81% of trips occurred inside state waters.[20] With over 70% of state waters existing within the exemption line, a significant portion of the fishery is executed close to shore.
Much of the fishery in this area uses small boats and skiffs which have limited capacity to haul and store multiple traps. Thus, consideration of trawl limits in exempted waters precipitates large safety concerns as it could force fishermen to operate beyond their boat's means, resulting in fishermen being caught in additional rope on deck, fishermen going overboard or losing limbs, and vessels sinking.
Further, trawling up requirements would have significant economic consequences on the fleet. Longer trawls would almost certainly increase gear loss as trawls are set over one another, increasing marine debris. It is also likely small boat captains would have to hire an additional crew member or purchase a larger boat to safely fish under the new requirements. Finally, longer trawls would result in lower trap efficiency due to a decreased ability to maneuver traps on to specific ledges and cracks where lobsters are frequently found.

[17] Taking of Marine Mammals Incidental to Commercial Fishing Operations; Atlantic Large Whale Take Reduction Plan Regulations, 72 Fed. Reg. 57103 (October 5, 2007).
[18] Endangered and Threatened Species; Critical Habitat for Endangered North Atlantic Right Whale, 81 Fed. Reg. 4837 (January 27, 2016).
[19] Record et al., 2019.
[20] Based on harvester reporting collected in the Maine lobster fishery.

b. Exempted Waters Line to Three Miles from Shore (0.8% of Maine's whale-days and 4% Maine's of overall risk, see Appendix I)

Proposal: Require a minimum trawl length of three traps per single endline.

Rationale: A three-trap trawl considers safety concerns of small boat, state-waters fishermen with the goal of reducing the number of endlines and the associated risk to right whales. Unique safety concerns for small boat fishermen include lack of deck space and frequently operating a vessel without a crew. Particularly in mid- coast Maine, moving to a three-trap trawl minimum will be a substantial change from current fishing practices where, due to bottom type, many people presently fish doubles.

c. Three Miles to Six Miles from Shore (Three to twelve miles from shore represents 11% of Maine's whale-days and 30% of Maine's overall risk, see Appendix I)

Proposal: Require a minimum trawl length of eight traps per two endlines, or four traps per single endline.

Rationale: An eight (four) trap trawl minimum recognizes the historical sighting of right whales in the Gulf of Maine is higher in federal waters than state waters and that higher trawl length minimums are needed to reduce the risk of entanglement. Various fishing practices along the coast make the unilateral transition to an eight- trap trawl with two endlines difficult; this region includes small boat fishermen who fish just over the three-mile line, as well as larger vessels which traditionally fish offshore. The ability to fish a four-trap trawl with a single endline provides needed flexibility to the fleet and achieves the same conservation value.

d. Six Miles to Twelve Miles from Shore (Three to twelve miles from shore represents 11% of Maine's whale-days and 30% of Maine's overall risk, see Appendix I)

Proposal: Require a minimum trawl length of fifteen traps per two endlines, or eight traps per single endline.

Rationale: A fifteen-trap trawl configuration is expected to result in substantial endline reductions in this area. The flexibility to use either a fifteen-trap trawl with two endlines or an eight-trap trawl with a single endline, near equivalent configurations from a conservation standpoint, allows for greater compliance with the regulations and recognizes that fishing practices differ along the coast. This flexibility in trawl configuration also considers fishermen safety and boat capacity, as some fishing operations in the region may not be able to safely haul and stow fifteen traps on a boat. Load cell data collected by ME DMR also informed the proposal for a fifteen-trap trawl length (see Section C-II). In particular, some of the load cell data collected to evaluate the placement of weak points measured loads on the vertical line of fifteen-trap trawls. This provided a level of data to inform both the trawling-up and weak point components of ME DMR's proposal.

e. Twelve Miles from Shore to the Lobster Management Area 1/3 Boundary (88% of Maine's whale-days and 66% of Maine's overall risk, see Appendix I)

Proposal: Require a minimum trawl length of twenty-five traps per two endlines.

Rationale: This trawl length provides the lowest ratio of vertical lines to traps in Maine's proposal. It also pushes the bounds of fishermen's safety. At ME DMR's June 2019 industry meetings, fishermen from many parts of the coast expressed significant concern that few vessels are equipped to handle thirty- or forty-trap trawls in addition to the mile of rope needed to fish at these trawl lengths. Requiring fishermen to operate beyond their boat's capacity would result in dangerous fishing practices and the potential loss of human life. A twenty-five-trap trawl length recognizes that vertical lines in the offshore areas of the Gulf of Maine pose a greater risk to right whales given whales are more frequently sighted in this area; however, it also acknowledges the limits on the capacity of fishing vessels in the area. Finally, this trawl length is enforceable, but longer trawls likely would not be. With current vessel platforms, it would be nearly impossible for Maine's Marine Patrol to safely haul long trawls (i.e. greater than 30 traps per trawl) to check compliance with ALWTRP measures.

Modifications to Maine's Approach on Vertical Line Reductions

At the April 2019 ALWTRT, there was a consensus statement that each state and/or Lobster Management Area (LMA) would meet a 60% risk reduction in their respective region. At the time, one way for Maine to achieve this target was to take a 50% vertical line reduction (equivalent to a 50% risk reduction) and implement 1700 lbs breaking strength rope in the top 75% of all vertical lines in federal waters (equivalent to a 10% risk reduction).

Since that time, outputs of the decision support tool have substantially changed based on modifications to the model as well as emerging and changing data. As a result, the information available to ME DMR is different than what was available at the time of the ALWTRT meeting. Specifically, the risk reduction attributed to weak rope has steadily increased. This is corroborated by peer reviewed literature which suggests a full weak rope would significantly reduce the risk of serious injury and mortality for multiple large whale species by 72%.[21] It also matches results of the analysis conducted by ME DMR (Appendix I). Given these changes, ME DMR has relied more heavily on weak points in the line (see Section C-II) as a method to achieve risk reduction.

Furthermore, analysis by ME DMR following the ALWTRT April 2019 meeting showed that, to achieve a 50% vertical line reduction, a substantial portion of this reduction would have to be taken within exempted waters. This is because roughly 70% of state waters, where the majority of the Maine lobster fishery is licensed, are within the exempt area.[22]

[21] Knowlton, A. R., Robbins, J., Landry, S., McKenna, H. A., Kraus, S. D., and T. B. Werner. 2015. Effects of fishing rope strength on the severity of large whale entanglements. *Conservation Biology,* 30, 2:318-328.

[22] Currently, reporting requirements do not allow for effort to be discerned between exempt and non-exempt waters. It is therefore assumed that 70% of vertical lines in the Maine state waters lobster fishery are shoreward of the exemption line because this is the percentage of area that is included shoreward of that line. This is also the assumption made in the

Implementing strict vertical line reduction measures in this area does not align with right whale sightings data and the associated risk of entanglement. Right whales are rarely sighted in Maine's exempted waters and copepod abundance does not support right whale feeding aggregations[23], hence why they were designated as areas where additional regulations would not provide meaningful conservation benefits to right whales. As a result, a 50% vertical line reduction would have forced the greatest regulatory change on areas where whales do not frequent, having minimal effectiveness. In contrast, the vertical line reductions put forward in this proposal focus on areas outside of exempted waters and provide more meaningful protections to right whales. We believe this is a stronger and more defensible plan which balances right whale conservation with maintaining a viable lobster fishery.

Trends Regarding Latent Effort in the Maine Lobster Fishery
A potential concern with vertical line reductions via trawling up is that latent licenses will become active and negate the intended conservation benefits. ME DMR reviewed trends in latent lobster licenses in Maine and found them to be extremely stable (Figure 1). In particular, over the last ten years, there has been little perturbation in the number of latent licenses in the Maine lobster fishery. This corresponds to a time of record high landings when we may have expected latent fishermen to re-engage in the fishery. Furthermore, this stability persisted through previous changes to the ALWTRP, including the 2014 vertical line rule which established the previous trawling-up minimums. Given these trends, ME DMR is confident the activation of latent licenses will not negate the conservation benefit gained by the proposed trawling-up scenarios and will result in meaningful reductions in vertical lines.

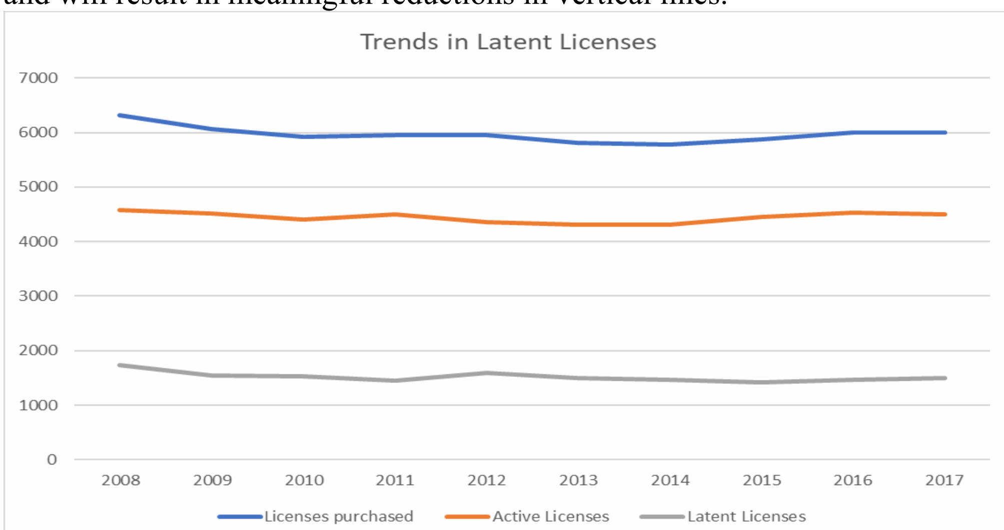

Figure 1: Trends in Maine lobster licenses, including number purchased, active licenses, and latent licenses. Data come from Maine DMR's license and 100% dealer reporting databases. Dealers are required to report purchases from all harvesters. Any harvesters without any reported purchased landings are considered latent.

Industrial Economics model of the fishery, which is used in the Decision Support Tool and accepted by both NOAA Fisheries and the ALWTRT as best available information.

[23] Endangered and Threatened Species; Critical Habitat for Endangered North Atlantic Right Whale, 81 Fed. Reg. 4837 (January 27, 2016).

Misconceptions about Changes in the Maine Offshore Lobster Fishery

It has been repeatedly alleged that effort in the offshore lobster fishery is expanding and thereby increasing the risk of entanglement posed by the fishery. In fact, this allegation is a basis for the conclusions made in the NEFSC's September 2018 technical memo. ME DMR sought to investigate this claim by looking at landings, number of trips, and catch per unit effort by distance from shore. Outside of 3 miles from shore, pounds landed (Figure 2) in the Maine lobster fishery has increased over time. However, a similar trend is not reflected in the number of trips; the number of trips in the federal Maine lobster fishery has been relatively stable (Figure 3). This suggests that there has been an increase in the landings per trip, rather than an increase in effort, which has contributed to the increased harvest offshore. This conclusion is supported in Figure 4; regardless of distance from shore, all areas have seen an increase in average catch per trap in the Maine lobster fishery. The slope of this increase is greater in federal waters than state waters. Thus, while it is accurate to say landings have increased in the federal Maine lobster fishery, there has also been a significant increase in average catch per trip.

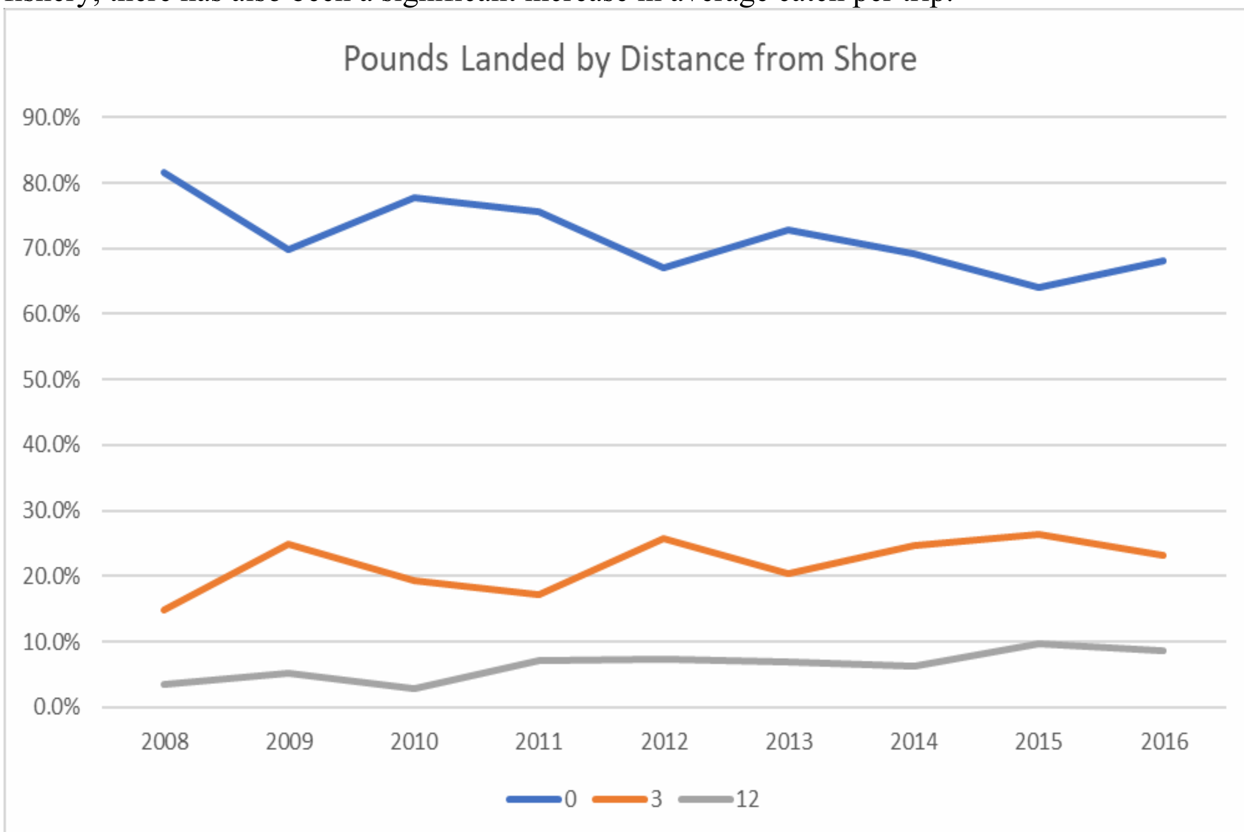

Figure 2: Proportion of pounds of American lobster landed by distance from shore in Maine. The blue line represents 0-3 miles from shore. The orange line represents 3-12 miles from shore. The grey line represents 12 miles to the LMA 1/3 boundary. Data come from Maine DMR's harvester reporting database.

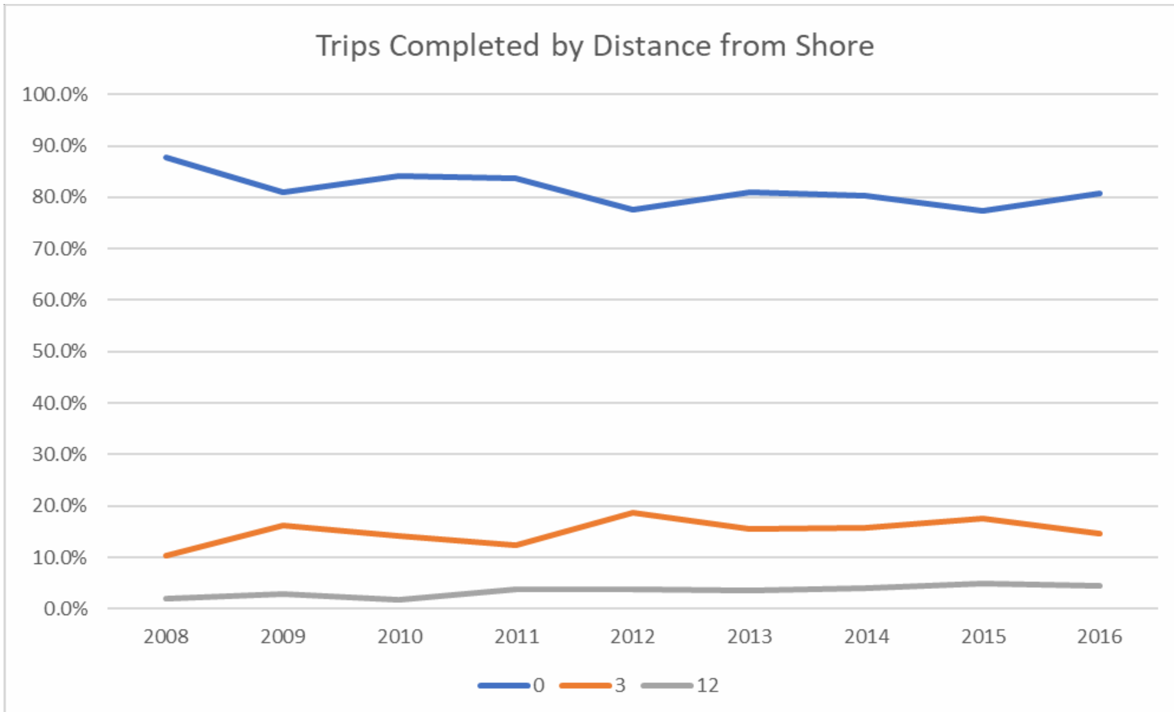

Figure 3: Proportion of directed American lobster trips in Maine since 2008. The blue line represents 0-3 miles from shore. The orange line represents 3-12 miles from shore. The grey line represents 12 miles to the LMA 1/3 boundary. Data come Maine DMR's harvester reporting database.

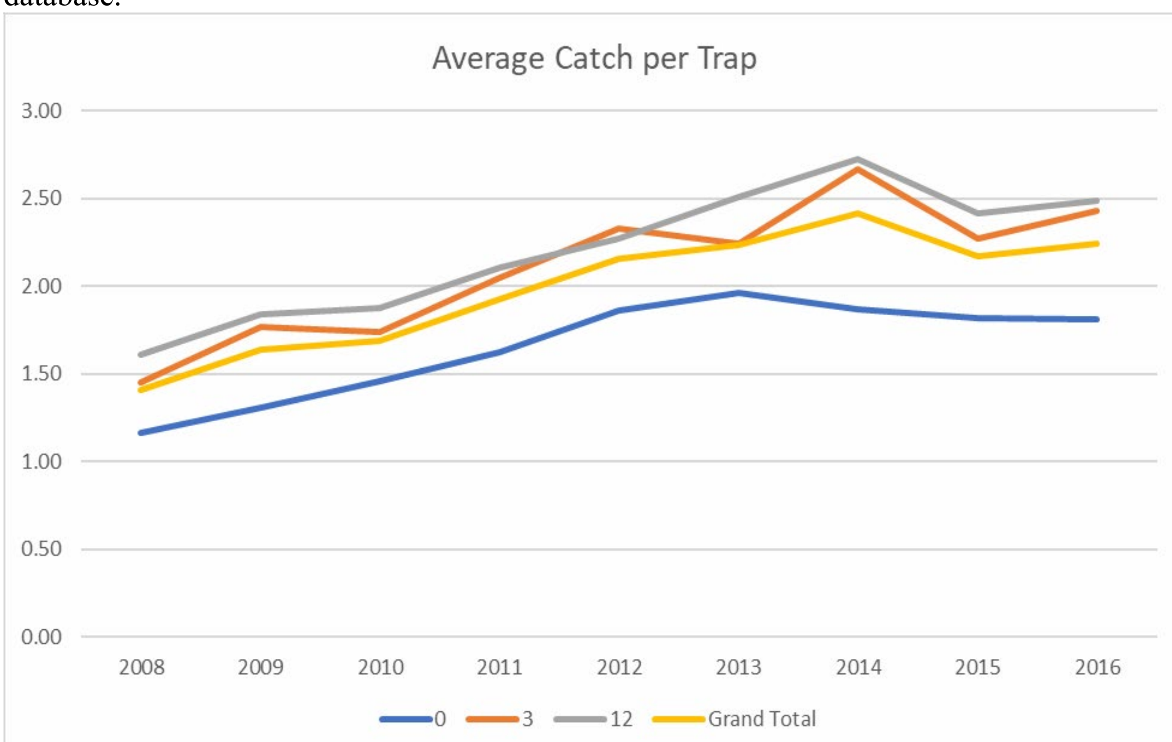

Figure 4: Average catch per trap (in pounds) in the Maine lobster fishery. The blue line represents 0-3 miles from shore. The orange line represents 3-12 miles from shore. The grey line represents 12 miles to the LMA 1/3 boundary. Data come from Maine DMR's harvester reporting database.

II. 1700-Pound Weak Points

This proposal includes the addition of weak points to remaining vertical lines in the Maine lobster fishery. This measure will result in rope breaking at 1700 lbs, a value determined in the literature to be weak enough to allow a right whale to break free.[24] Moreover, Knowlton *et al.*, concluded from their research that a 1700 lbs breaking strength will significantly reduce the rate of serious injury and mortality to right whales as a result of entanglements. Thus, it offers a level of protection for all lines left in the water.

Appendix V describes results of ME DMR's research initiative to determine the breaking strength of vertical lines already being used by the fishery, as well as various rope and weak point configurations. This analysis is provided to NOAA Fisheries to begin the development of a list of 1700 lbs weak points options approved for use in the fishery. ME DMR has specifically focused on weak points which result from alterations to existing rope. This aligns with ME DMR's goal of reducing economic impacts on the fishery. As such, ME DMR plans to continue this work with the industry and requests the ability to continue to refine and add to the list of options approved for use as 1700 lbs weak points.

ME DMR highlights that weak points, in combination with the minimum trawling-up levels proposed, must be in conjunction with conservation equivalency. Due to the varying fishing conditions along the coast, a 'one size fits all' approach does not work in Maine. As a result, a method for flexibility must be included in the proposed rule so that, in consideration of local practices and challenges, fishermen can suggest modifications to the regulations to achieve the same level of protection for right whales. Conservation equivalency is particularly important for safety; without a method to modify the state-wide proposal to fit regional oceanographic conditions, fishermen will be required to partake in unsafe fishing practices. ME DMR is committed to ensuring the safety of fishermen throughout this regulatory process and feels conservation equivalency is a key to this endeavor. Sections VI and VII provide greater detail on this management flexibility.

a. State Waters (shoreward of the 3-mile line)

Proposal: Through state regulations enacted by ME DMR, a single 1700 lbs weak point will be required half way down vertical lines in the Maine lobster fishery.

Rationale: The inclusion of weak points in all vertical lines means rope will part at the 1700 lbs breaking strength recommended in literature and by the ALWTRT. In particular, including a weak point in exempted waters provides protection such that, in the rare event a right whale enters exempted waters and gets entangled, the encounter will not result in a SI&M. It is important to note that the risk reduction associated with the weak point in exempted waters is not included in ME DMR's analysis as shown in Appendix I. As a result, the risk reduction achieved from the implementation of a weak point in exempted waters is in addition to the risk reduction percentage calculated in Appendix I.

[24] Knowlton et al., 2015.

ME DMR intends for this measure to be implemented in state regulations and not in the federal ALWTRP. It is recommended NOAA Fisheries cite the state regulation when federal regulations are published. If necessary, ME DMR would support a clause that, if Maine removes this state regulatory requirement, NOAA Fisheries would take emergency action to implement the same regulatory measure in the ALWTRP.

b. Federal Waters (3-mile line out to 12 miles)

Proposal: Two 1700 lbs weak points will be required in the top half of all vertical lines in the Maine lobster fishery from the 3 -mile line out to 12 miles. One weak point should be roughly 25% down the vertical line and the other roughly 50% down the vertical line.

Rationale: The inclusion of weak points in all vertical lines means rope will part at the 1700 lbs breaking strength recommended in literature and by the ALWTRT. As a result, this substantially reduces the risk of serious injury and mortality in Maine's waters.

Based on industry comments, ME DMR is concerned that, in some areas, a weak point 50% down the vertical line may compromise fishermen safety when hauling, particularly as the minimum trap-per-trawl requirement increases. Maine's Commercial Fishing Safety Council, a body established in state statute charged with providing information and advice concerning fishing safety issues, also expressed concerns particularly when fishing in large tides. Given it is likely that a weak point 50% down the vertical line may work for some fishermen and not for others, ME DMR highlights the importance of having a method for conservation equivalency and individual safety exemptions in the federal proposed rule (see Sections VI and VII). This flexibility would allow some lobster management zones and/or individuals in Maine to achieve the same level of conservation by adopting a different measure (e.g. greater level of trawling-up, trap reduction) in order to move the weak points further up the vertical line.

c. Federal Waters (outside 12 miles)

Proposal: One 1700 lbs weak point one-third of the way down the vertical line in the Maine lobster fishery outside 12 miles from shore.

Rationale: The inclusion of weak points in all vertical lines means rope will part at the 1700 lbs breaking strength recommended in literature and by the ALWTRT. As a result, this substantially reduces the risk of serious injury and mortality in Maine's waters.
Proposing one weak point further up the vertical line outside 12 miles is in response to safety concerns heard from the fishing industry and Maine's Commercial Fishing Safety Council. Trawl minimums of 25-trap trawls fished in deeper waters at this distance from shore put higher hauling loads on the vertical lines and could result in safety issues.
Putting a weak point one-third of the way down the vertical line, as per the recommendation of the Maine Commercial Fishing Safety Council, puts a protection measure in place for right whales encountering the top of the vertical line, while ensuring the safety of fishermen utilizing these waters. A greater description of these safety concerns and associated data are included on pages 22-25.

Maine's proposal for weak points was developed by focusing on three factors: feasibility, enforceability, and protections to right whales. ME DMR originally began to consider the inclusion of weak points in vertical lines because a 1700 lbs manufactured rope is currently not available at marine supply stores. Further, ME DMR's testing of various functional breaking strengths (Appendix V) indicated a 5/16th diameter rope would be needed to meet the threshold of breaking at 1700 lbs. At industry meetings, fishermen consistently commented that 5/16th diameter rope would be too small for their haulers. Given these constraints, ME DMR began to consider weak points as a way to reduce the breaking strength of vertical lines.

Enforceability of Proposed Weak Point Measures

In its development of a weak point proposal, ME DMR had several conversations with law enforcement personnel to determine what types of weak point measures can be enforced on the water. Maine Marine Patrol agreed that implementing regulations requiring a specific number of weak points in broad fishing areas is enforceable; but requiring weak points based on a prescribed depth interval is not. More specifically, if a regulation were to require weak points at a specified depth spacing, each fisherman would have a different weak point requirement for each of his or her lines depending on the depth at which his or her traps were submerged. As a result, enforcement personnel would have to know the depth of water when the traps were set and then count the associated number of weak points to determine compliance. Not only is this time consuming but it is impractical given depths change throughout the day due to tides. Further, traps can be moved in large storms, meaning a trap legally set at one depth may be moved to a different depth and be in violation of the ALWTRP.

Trying to create uniformity in weak point regulations by lobster zone also poses enforcement challenges. Depths vary between and within Maine lobster zones. For example, offshore regions of Zone G (adjacent to the New Hampshire border) have much shallower sections than its neighboring Zone F. As a result, regulations based on depth would result in different weak point requirements for the two zones. This disparity between zones creates complications given fishermen can, and often do, move between adjacent areas. Under Maine's regulations, fishermen can fish up to 49% of their traps in an adjacent zone. This means, for example, a Zone G fisherman can fish 49% of his or her traps in Zone F. If fishermen setting traps side by side are subject to different regulations, enforcement of these regulations becomes extremely difficult.

Operational Feasibility for Industry

Another key consideration for ME DMR when discussing weak points was their feasibility for industry. Staff at the NEFSC compiled information showing the number of points which would result if weak points were required every 40 ft in the top half of a vertical line (Figure 5). While this analysis was intended for discussion, it highlighted the impracticality of weak points at this spacing. Specifically, fishermen in three to six miles would be required to have roughly 3 to 8 weak points in the top half of their line as water depths increased; fishermen in six to twelve miles would be required to have roughly 5 to 13 weak points in the top half of their line; and fishermen outside of twelve miles would be required to have anywhere from 5 to 20 weak points in the top half of their line. These numbers of weak points would likely incentivize the use of more rope, increasing the risk of whales getting entangled in the water column and fishermen getting entangled in additional rope on deck. At ME DMR's industry meetings, fishermen commented that, in response to an initial proposal that 75% of their vertical line break at 1700 lbs, they would likely lengthen their vertical line to ensure a safe rope strength when hauling traps. ME DMR believes a similar response would occur if numerous weak points are required; fishermen will likely lengthen line, even at the cost of adding more weak points, to ensure 'strong' rope when hauling. This outcome is counter to the efforts of the ALWTRT as it would result in the presence of additional slack rope in the water, thereby increasing the risk of entanglement.

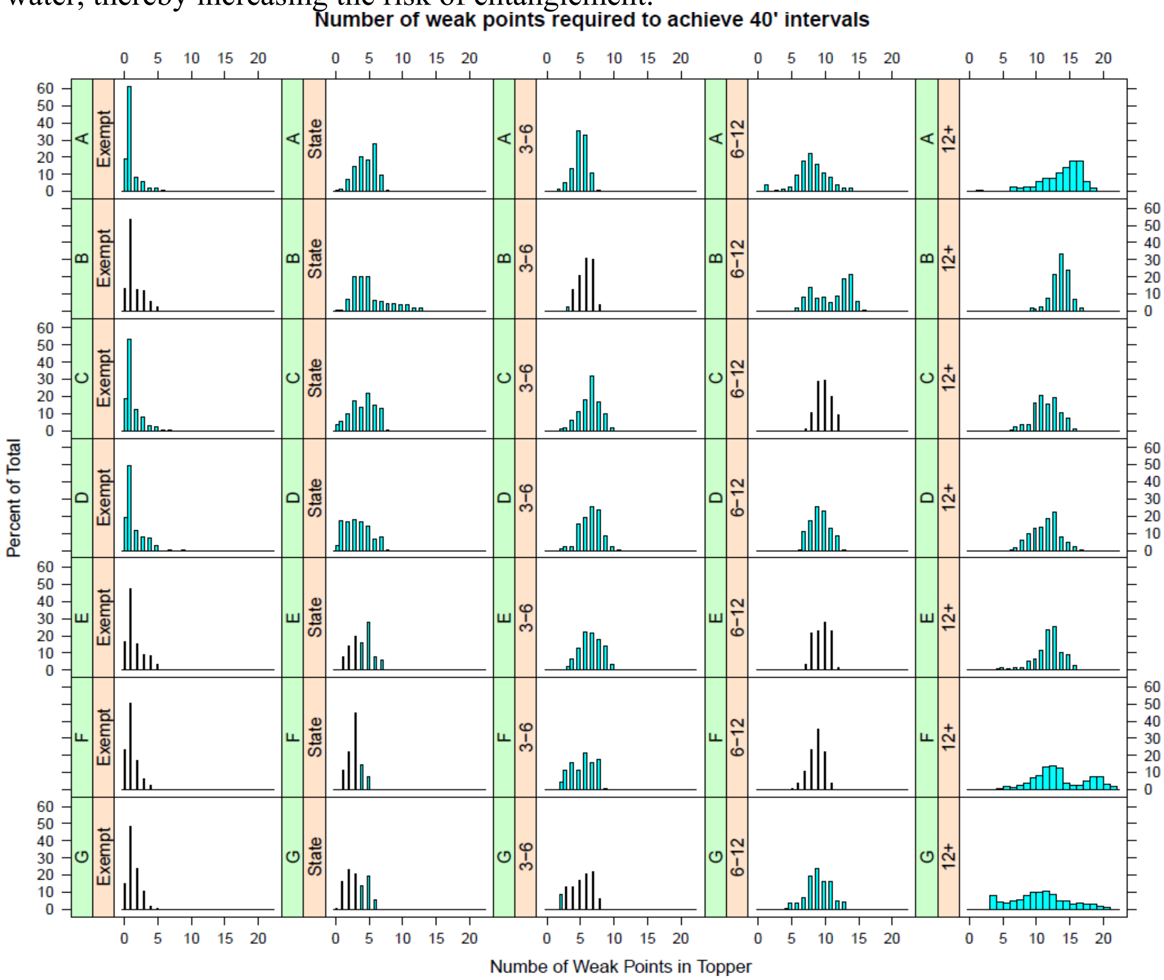

Figure 5: Number of weak points in the top half of a vertical line if required every 40 ft, by Maine lobster zone and distance from shore. Data and figure provided by the NEFSC.

ME DMR is confident that its proposal for 1700 lbs weak points is enforceable, feasible, effective and, most importantly, will not create perverse incentives which jeopardize right whale conservation. A specific number of weak points is enforceable because it is simple and uniform based on distance from shore. This proposal is also feasible for fishermen, helping to ensure compliance with the regulations. ME DMR does not anticipate it will drastically alter current vertical line lengths given rope strength is preserved in the bottom half of the vertical line where load cell data shows the strain is highest.

Development of Weak Point Measures: Data and Previous Discussion

In ME DMR's analysis for this proposal, we found a lack of data or peer-reviewed literature regarding the ideal distance between weak points. Further, the definition of weak rope, how weak points may be integrated into vertical lines, or how much risk reduction should result from these measures were not agreed upon at the April 2019 ALWTRT meeting. Review of the meeting summary for the April 2019 ALWTRT meeting showed neither a discussion regarding the appropriate spacing of weak points nor a definition of what might constitute weak rope was ever made or included in the vote.

In the history of the ALWTRT, there have been discussions and proposals which have included measures which occur every 40 ft; however, it has never been formally agreed that this is the correct spacing for any measure. ME DMR reviewed the origin of the 40 ft spacing and found it was initially a recommendation developed for potential gear marking requirements. The first mention of using 40 ft spacing for gear marking occurred in a 2009 report on experimental wire tags from the International Fund for Animal Welfare. This report was included as a part of the November 2010 ALWTRT meeting. The report suggests that because 90% of the gear recovered from whales is at least 40 ft in length, marking gear every 40 ft would result in 90% of recovered gear having a mark which can be used to discern fishery and/or set location. The data referred to in the report are from a study conducted by John Kenney, a former NMFS gear specialist. Kenney looked at gear taken off of whales from 1997-2003 which ranged in length from 5-1200 ft. He found in the 61 samples analyzed, the average length of line was 181 ft, the median length was 102 ft, and the lower and upper quartiles were 60 and 222 ft, respectively. From this analysis it was concluded that 12 ft spacing would result in 95% recovery of a mark, 40 ft would result in 90% recovery, 60 ft would result in 75% recovery, and 102 ft would result in 50% recovery.

The first place that the 40 ft spacing was used in conjunction with a weak point was in the April 2017 ALWTRP exemption request from the Massachusetts South Shore Lobstermen's Association. In this proposal, the fishermen proposed to implement a weak sleeve (breaks at 1700 lbs) every 40 ft in their vertical lines as a way to be able to fish inside the Massachusetts Restricted Area closure. The 40 ft spacing was used, not because it was determined to be the ideal spacing for weak points, but because they were proposing the sleeves double as their gear marking requirement as well. This proposal was not ultimately accepted by the ALWTRT.

There have also been comments that the 40 ft spacing is consistent with the girth or length of a right whale. ME DMR maintains this has not been discussed by the ALWTRT nor has it been published in peer-reviewed literature. Therefore, 40 ft spacing has no basis as the standard by which the addition of weak points for the conservation benefit of right whales should be held.

Modifications to Maine's Weak Rope Measures

At the April 2019 ALWTRT meeting, the implementation of 1700 lbs breaking strength rope in the top 75% of vertical lines was discussed for the federal Maine lobster fishery. This idea was presented to fishermen at ME DMR's industry meetings in June 2019 and concerns were expressed regarding the ability to safely haul gear. Specifically, fishermen were concerned that weakening the top 75% of the vertical line in combination with the proposed increases in trawl lengths would reduce safety at sea. Many fishermen commented that, to accommodate the proposed weakening of the majority of their endline, they intended to increase the length of their vertical line to lengthen the bottom 25% of their endline and ensure enough rope strength when hauling traps. Increasing overall amounts of rope in the water is counter to the efforts of the ALWTRT, particularly when such additional line will likely be slack. Industry members that fish in federal waters inshore of the 12 mile line did express that, with existing vertical line lengths, modifications to the top 50% of the rope would be more feasible and preferable, in that it would not likely lead to fishermen's use of increased rope amounts. As a result, ME DMR moved towards examining changes to the top 50% of the rope to ensure industry feasibility and safety in addition to the protection of right whales.

ME DMR has heard from fishermen fishing outside of 12 miles that a weak point 50% of the way down the vertical line would present safety concerns given the 25-trap minimum being proposed in this area. These concerns are supported by the load cell data gathered by ME DMR and presented in Figure 8 (discussed in depth below). Loads recorded on vertical lines for gear being fished in more than 100 fathoms of water and more than 20-traps on a trawl exceeded 2,000 lbs of load. Hauling loads at a weak point 50% of the way down the line would likely result in loads routinely over 1,000 lbs of force. To accommodate weather conditions, hang downs, and set over events, ME DMR worked with industry to propose a weak point one-third of the way down the vertical line.

Using Load Cell Data to Inform Protections for Whales and Safety for Fishermen

The strategy to achieve a conservation benefit for right whales in the top portion of the line, while maintaining safe hauling practices for fishermen, is supported by data collected through ME DMR's vertical line research initiative. Beginning in 2018 and extending through 2019, ME DMR worked with fishermen throughout the Gulf of Maine region to deploy load cells on lobster vessels and document the hauling loads experienced by vertical lines during common fishing conditions. Of the 14 fishermen who fished with load cells on their boats, six of those were from Maine, documenting over 140 hauls in five of the seven Maine Lobster Management Zones (Figure 6). The Maine portion of the dataset occurs in federal waters and includes trawl lengths ranging from 15 to 20 trap trawls in depths of 55- 125 fathoms.

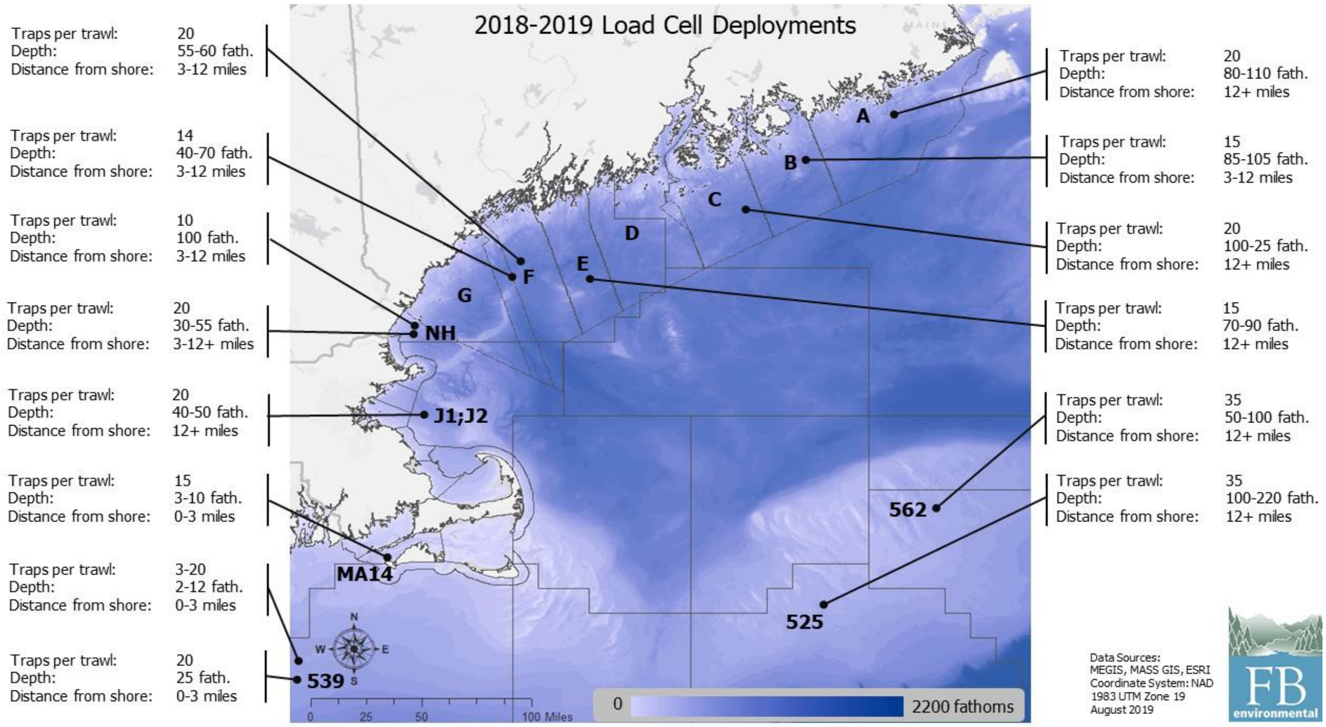

Figure 6. Summary of load cell deployments throughout the Gulf of Maine and New England with associated information on the trawl lengths, depth, and distance from shore.

Results of the load cell deployments show peaks in the load asserted on the line as the trawl is being hauled (Figure 7). Often, the highest peaks in the loads are in the first section of the haul, including the vertical line, because this corresponds to when the maximum number of traps are suspended in the water column. Most of the hauls recorded were in calmer weather and, while some gear set overs (where a trawl is laid over another) were recorded, these results shouldn't be expected to show the highest possible loads that would be experienced by fishermen in more extreme hauling events.

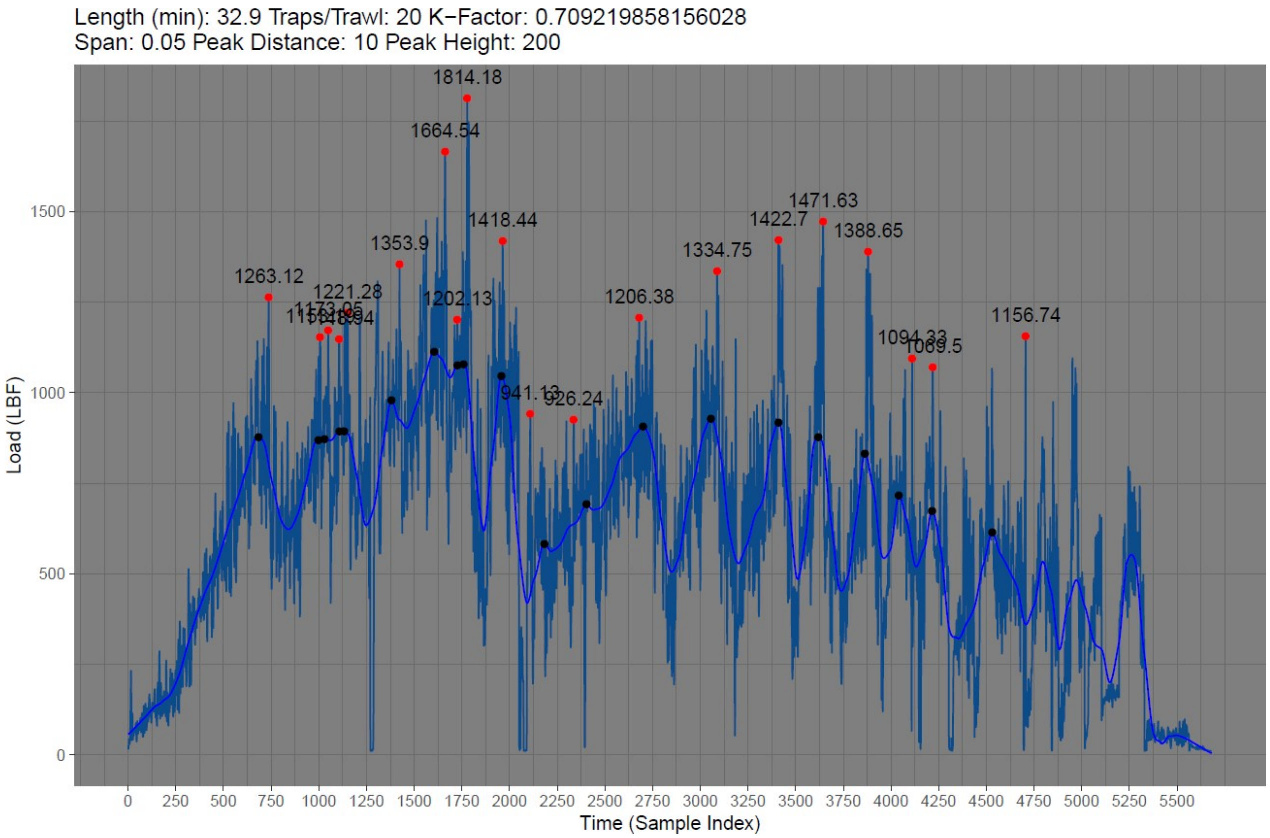

Figure 7. An example of a load cell output from a 20-trap trawl. The portion of the haul that is the load on the vertical line occurs between 0-750 on the time axis and increases steadily as traps are picked up off of the bottom. The first trap coming onboard the vessel is denoted by the red circle and was validated by observers on the vessel. The peak load on the vertical line occurred at the first trap with a load of 1,263 lbs. Loads after this point were hauled on the groundline.

The results from the load cell deployments in Maine federal waters support the concerns expressed by fishermen, namely that the combination of increased trawl lengths and weak points half way down the line could compromise safety. Figure 8 shows the average and range of hauling loads on the vertical lines for a variety of trawl lengths and how those loads are affected by the depth of the trawl. Trawl lengths of 20 traps in more than 100 fathom depths have average vertical line loads greater than 1700 lbs and range over 2000 lbs. As a result, it is essential that this portion of the fishery be allowed a sufficient length of vertical line at the bottom to be able to haul these common working loads safely.

The average hauling loads documented for trawls between 5-20 traps in 50-100 fathoms are below the 1700 lbs threshold for loads. However, this does not allow a safety buffer for more extreme hauling events that include weather, gear set-overs, and getting hung-down (or caught) on rocky bottom. There were 60 hauls of 15-trap trawls in this depth range with the load cells. The maximum load recorded on a vertical line was 2,152 lbs, which is over the weak point 1700 lbs threshold. The average vertical line hauling load of these trawls was 1365 lbs, just 335 lbs below the 1700 lbs target. 25% of these hauls recorded vertical line loads over 1500 lbs and 97% of hauls were over 1000 lbs. Additionally, 100% of hauling loads for the 5-trap trawls in this depth bin were also over 1000 lbs of load.

ME DMR supports the industry's request for safe buffers in working line loads to allow for variables that impact both the load put on lines during hauling and the likelihood that a line may break. These variables include the natural degradation of line strength over time, extreme hauling events, weather, and tides.

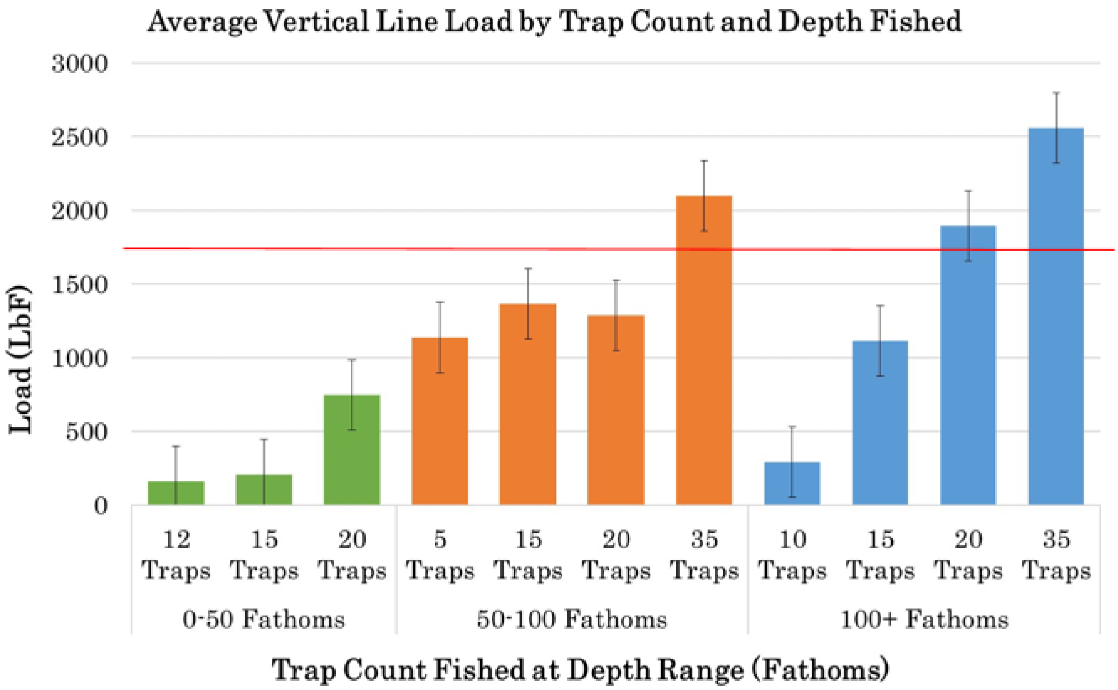

Figure 8. All recorded vertical line loads binned by trawl length and depth fished. Average vertical line loads for more than 20-trap trawls in 100 fathoms of water are above the 1,700 lbs weak point threshold. Trawl lengths from 5-20 in the 50-100 fathom depth bin average below the 1700 lbs threshold, but almost reach over 1000 lbs almost 100% of the time.

Implications for Drag Should Entanglement Occur

In this proposal, varying lengths of vertical line have the potential to be left on a right whale in the event it becomes entangled and the rope breaks at a weak point. The length of the trailing line depends on the initial length of the vertical line and the number of weak points required in the area. Figures 9-11 were developed by the NEFSC for discussion around this topic and show the spectrum of line lengths which could be left on right whales under this weak point proposal. Figure 9 should be used for the state waters (all exempt and non- exempt state waters) proposal of one weak point half way down the vertical line. In general, less than 100 ft of line would be remaining after a break inside the exemption area. Only slightly more, up to 150 ft, could be left on a right whale in Maine's non-exempt state waters.

Figure 10 shows the lengths of line that could result from three to twelve miles in federal waters where two weak points in the upper 50% of the vertical line are required. The results vary by distance from shore, which is mainly attributable to the differences in depth and therefore the scope of the vertical line in each area. From 3-6 miles from shore the length of line left on a whale could range from about 50-125 ft. The more offshore section from 6-12 miles increases to a range of 100-200 ft.

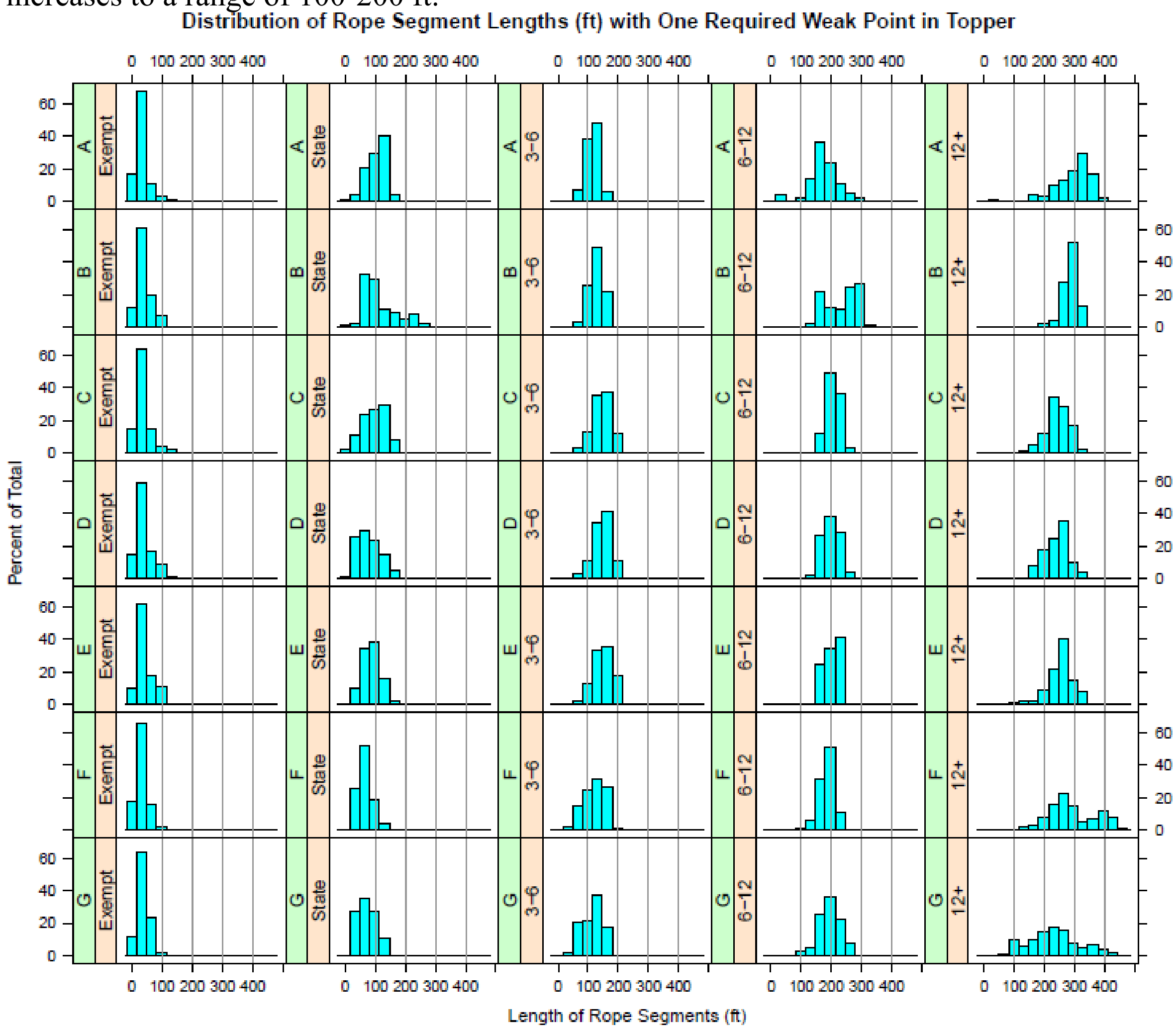

Figure 9. This figure was prepared by the NEFSC for discussion purposes. The first two columns, "exempt" and "state", show the range in lengths of lines that could be left on a right whale after a weak point breaks. This is assuming one weak point 50% down the vertical line in state waters and is categorized by the amount of gear in a given depth. Most gear inside the exemption line would result in less than 100 ft of line remaining on a right whale after a break. Gear in non-exempt or "state" waters would result in slightly longer lengths of line, generally ranging from 100-150 ft.

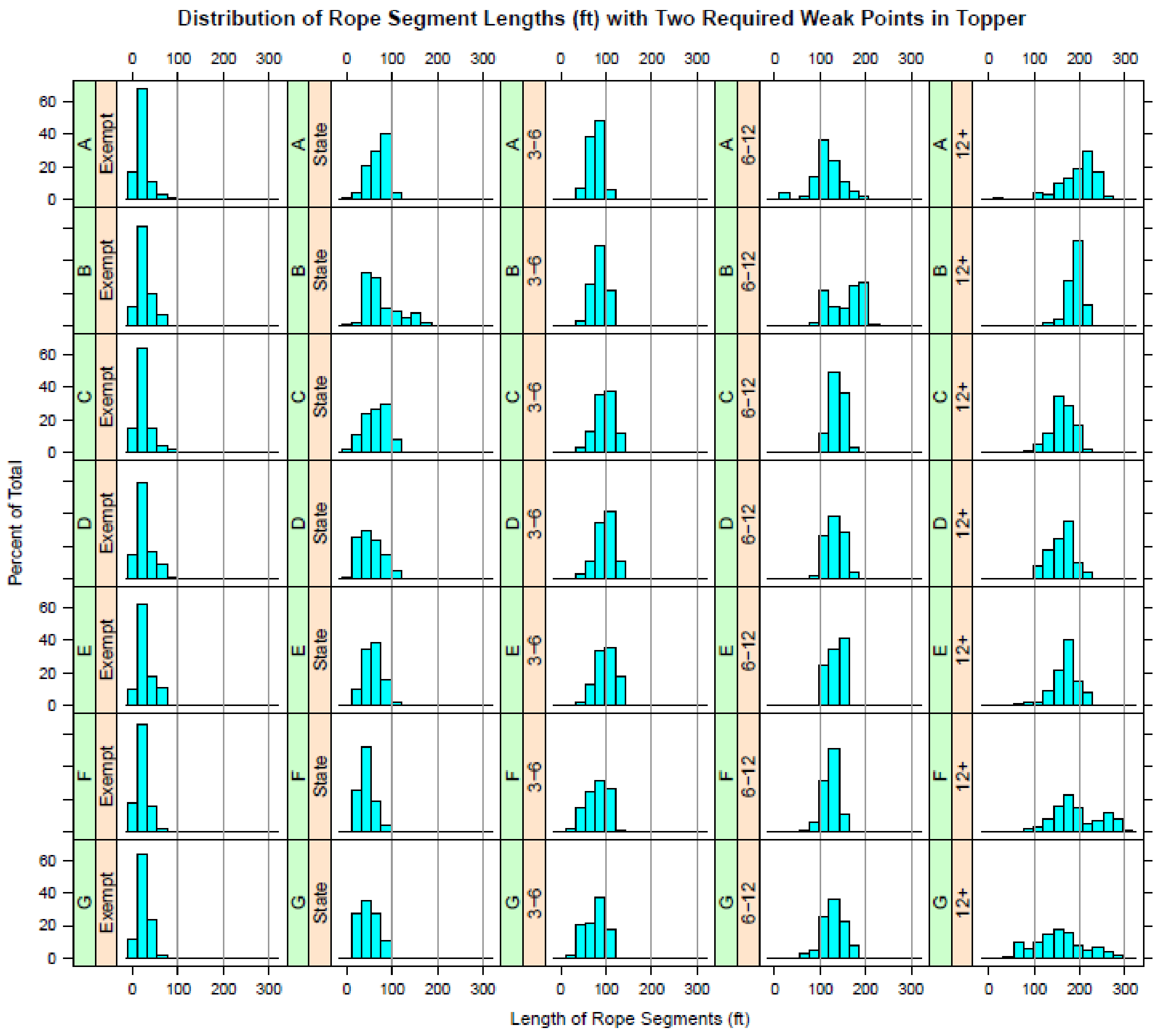

Figure 10. This figure was prepared by the NEFSC for discussion purposes. The columns labeled "3-6" and "6-12" show the range in lengths of lines that could be left on a right whale after a weak point breaks from three to twelve miles in federal waters by distance from shore. This is assuming two weak points in the top 50% of the vertical line in this area and is categorized by the amount of gear in a given depth. Most gear in the 3-6 mile band would range in remaining line length from 50- 125 ft. A break in the distance range 6-12+ could result in lines left from 100-200 ft.

Under this proposal the area outside of 12 miles from shore will have one weak point 1/3 of the way down the vertical line from the buoy to accommodate the safety needs of the fleet operating in deeper depths with longer trawls. Figure 11 shows the distribution of vertical lines occurring at different water depths by distance from shore in Maine waters. The fishing area outside of 12 miles can generally range from 50-125 fathoms depth, but most of the vertical lines occupy the depths around 100 fathom. Assuming a 1.5 scope of vertical line length to depth, a common practice in the fishery, the vertical line lengths would range to 188 fathom. A weak point breaking 1/3 of the way down this vertical line could result in a line 62 fathom in length on a right whale.

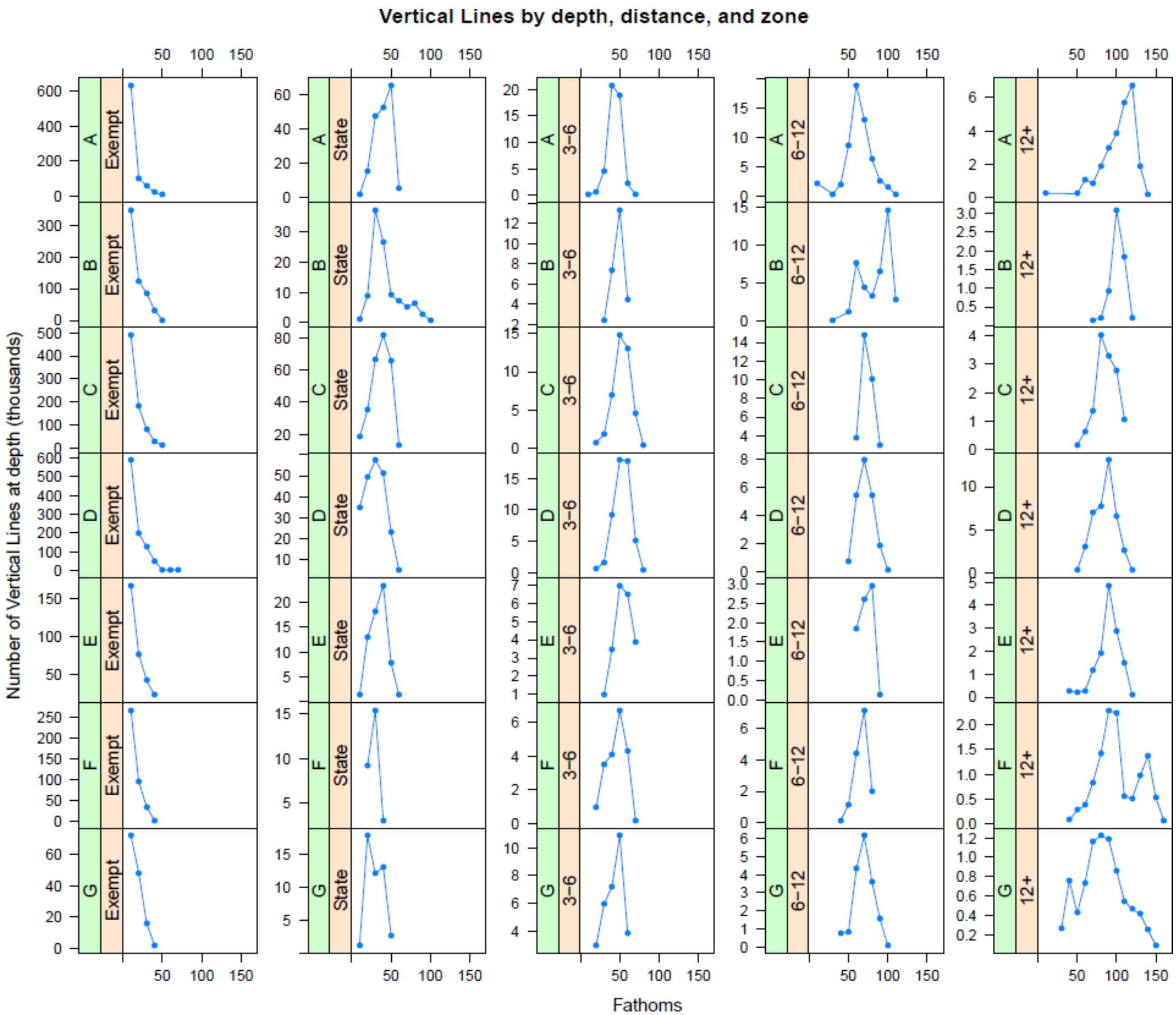

Figure 11. This figure was prepared by the NEFSC for discussion purposes. The last column label "12+" by Maine Lobster Management Zones A-G, shows the number of vertical lines distributed in that area by depth in fathoms. Most of the gear set in the 12+ distance from shore is set in a range around the 100fa depth strata.

Van der Hoop *et al.* (2015)[25] shows some results of the drag resulting from different lengths of 5/16" line and concludes shorter lengths of line are better for whales due to less drag forces being applied to the swimming whale. ME DMR attempted to duplicate these results using two different diameters of rope most common in the fishery: 3/8" and 7/16" sink rope. Van der Hoop used a range of line lengths including 82-480 ft. DMR used a set of three lengths which included 60, 120, and 240 ft. In the ME DMR study (Figure 12), the different diameters and lengths of line were tested using a load cell to measure the pounds of drag force exerted on the lines at varying vessel speeds. The slow speed, around 2.5

[25] Van der Hoop, J. M., Corkeron, P., Kenney, J., Landry, S., Morin, D., Smith, J., and M. J. Moore. 2015. Drag from fishing gear entangling North Atlantic right whales. *Marine Mammal Science,* 32, 2:619-642.

knots, simulates the swimming right whale. The higher speeds may be confounded by the wake created by the vessel exerting more drag force on the lines.

The results show that, at the 2.5 knot speed, drag forces are at or below 10 lbs of force for any of the line lengths in both studies. DMR's results show that at the line lengths of 60 and 120 ft, line drag is less than 5 lbs of force. Lengthening the line out to 240 ft only increased the drag a couple of pounds, up to 7 lbs of drag force. DMR believes that increasing the number of weak points and, therefore, shortening the distance between them will have minimal effect on the potential drag for right whales, but would come at a much greater cost to the fishing industry.

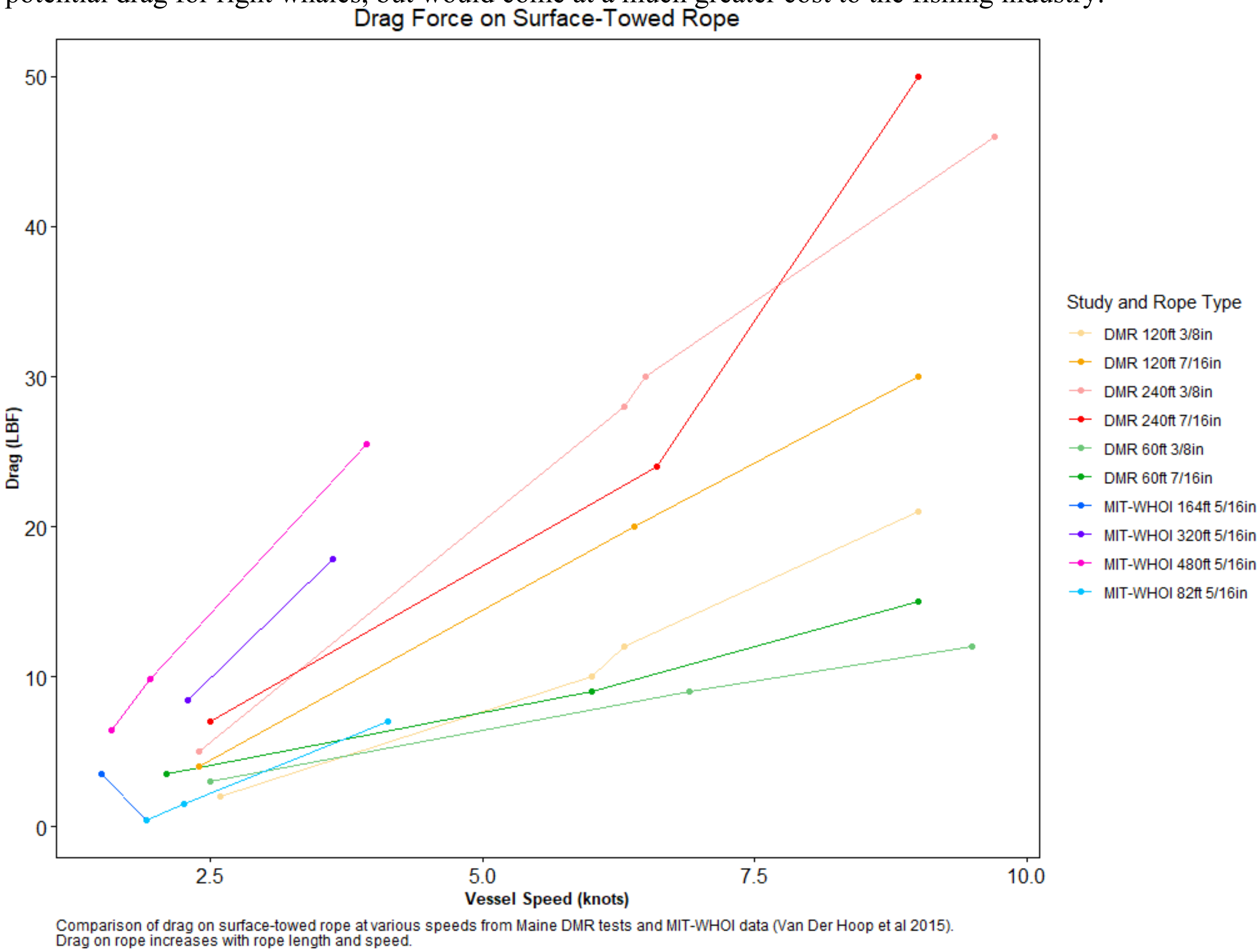

Figure 12. Data from ME DMR field trials assessing the drag force exerted by different diameters and lengths of line are plotting here next to the results from Van Der Hoop *et al.* 2015. At the speed of 2.5 knots, all lengths of line exert less than 10 lbs of drag force, with the 60 and 120 ft lengths exerting less than 5 lbs.

III. Gear Marking

a. Exempt Waters (shoreward of the exemption line)

Proposal: A purple Maine-only gear mark is required at the top, middle, and bottom of the vertical line. The top mark is 36" in length and must be in the top two fathoms of the line. The middle and bottom marks are 12" in length. Gear mark requirements within exempt waters have been finalized by the adoption of state regulations.

Note: ME DMR finalized gear marking requirements for exempt waters at its October 2019 DMR Advisory Council meeting. The regulations set an implementation date of September 2020, ahead of the federal regulatory process, and will allow for individuals to switch to purple gear-marking ahead of the implementation deadline. A copy of the regulations can be found here: https://www.maine.gov/dmr/laws-regulations/regulations/documents/dmrchapter75_11132019.pdf

It is recommended NOAA Fisheries cite ME DMR's regulation when the federal rule is published and include a clause that, if the State removes this requirement, NOAA Fisheries would take emergency action to implement the same regulatory requirement in the ALWTRP.

Rationale: (see rationale included for non-exempted waters below)

b. Non-Exempt Waters

Proposal: A purple Maine-only gear mark replaces the existing 12-inch red marks at the top, middle, and bottom of the vertical line. In addition, a 6" green mark and a 36" purple mark, in the top two fathoms of the line will be required.

Note: ME DMR finalized gear marking requirements for non-exempt waters at its October 2019 DMR Advisory Council meeting. The regulations set an implementation date of September 2020, ahead of the federal regulatory process, and will allow for individuals to switch to purple gear-marking ahead of the implementation deadline. A copy of the regulations can be found here: https://www.maine.gov/dmr/laws-regulations/regulations/documents/dmrchapter75_11132019.pdf

Rationale: It has been clear throughout the ALWTRT discussions that a primary impediment to the development of regulations is the lack of conclusive data on what gear is involved in entanglements. This includes cases in which no gear is present and cases in which gear is retrieved but does not have markings which can be traced to a specific fishery. Maine's gear markings address both of these challenges by increasing the amount of gear that is marked and increasing the frequency of markings on those lines. Maine has adopted these additional gear markings ahead of the federal regulatory process given the importance of spatially-specific data.

The core of Maine's gear marking proposal is the implementation of a state-specific purple mark for Maine's lobster fishery. At present, all Northeast trap/pot gear is identified by a red mark. This lack of spatial specificity means that, if red-marked gear is retrieved during an entanglement, the gear cannot be attributed to a specific state. As a result, it is nearly impossible to develop protections for right whales which are specific to fisheries or regions with confirmed entanglements, and broad-brush management measures must be used as a default. Maine's adoption of a state-specific mark will help provide the basis for spatially specific data and support better management advice in the future. Furthermore, a lack of purple marks in future entanglement records will help Maine justify the success of its right whale protection measures in place at that time.

Another major component of Maine's gear marking plan is the requirement that all commercial lobster gear within Maine's exempted waters be marked. Currently, gear fished shoreward of the exemption line is not subject to the gear marking requirements in the ALWTRP. While scientific evidence does not show that right whales frequent exempted waters or that gear within the exemption area has contributed to a right whale entanglement, the State does recognize that this lack of marking creates holes in the data. Requiring this gear to be marked will address these data gaps and greatly increase the number of marked vertical lines. Further, it will reduce uncertainty surrounding the retrieval of gear that is unmarked since all Maine commercial lobster gear will be subject to marking requirements and, therefore, identifiable.

Gear in both the exempt and non-exempt waters will be required to have a 36" purple mark in the top two fathoms of the line. This requirement stemmed from a Coast Guard and New England Fishery Management Council recommendation intended to increase the visibility and frequency of markings. Specifically, the Coast Guard suggested a 36" mark at the top of the line could enable the identification of fishery-specific gear from various platforms such as boats and planes. This would mean data in the entanglement record could be significantly improved without gear being retrieved. Further, the additional mark increases the number of marks per line by 25%, making it more likely that a piece of retrieved gear from an entangled whale will have a mark.

Finally, Maine is proposing a green mark, in combination with the Maine-only purple mark, be required on vertical lines outside of exempted waters. A cornerstone of Maine's right whale regulations is the exemption line, which identifies inshore waters and bays where right whales are rarely, if ever, present. This exemption line creates a balance between establishing protections for right whales and ensuring a viable lobster fishery in Maine. As all Maine lobster gear becomes marked, it is critical to differentiate between gear in exempted versus unexempted waters given the two regions are subject to different regulations. Requiring an additional green mark, in combination with the purple mark, allows Maine to achieve this objective.

IV. Harvester Reporting

a. <u>All Maine Commercial Lobster License Holders</u>

Proposal: Move the Maine lobster fishery to 100% harvester reporting.

Rationale: Currently 10% of Maine lobster license holders are randomly selected each year to complete harvester reporting. While analysis by the ASMFC's Lobster Technical Committee[26] suggests this level of reporting is enough to get precise estimates of catch, it does not provide the level of information on fishing effort or location needed for current right whale discussions. Increased harvester reporting will close this data gap and provide a complete picture of activity in the Maine lobster fishery. Addendum 26 to Amendment 3 to the Atlantic States Marine Fisheries Commission American Lobster Fishery Management Plan, which was approved in February 2018, requires all states to implement 100% active commercial harvester trip-level reporting by January 1, 2024. Given, the importance of improved fishery effort data to ongoing discussions, ME DMR is considering adopting 100% reporting ahead of the ASMFC requirement.

Moving to 100% harvester reporting in the Maine lobster fishery is a large financial endeavor. The Maine lobster fishery comprises roughly 40% of all commercial fishing trips taken each year by all fisheries along the Atlantic coast. As a result, the anticipated volume of reports requires additional ME DMR staff for QA/QC, technical support, and licensing. Further, options for electronic reporting will need to be developed and offered to defray costs associated with paper reporting. Currently, DMR is under contract with a third-party firm to develop a harvester reporting application (expected to go live in Fall 2020) for iOS and Android devices that will make harvester reporting more efficient and user-friendly.

ME DMR has also submitted a proposal for funding to the Atlantic Coast Cooperative Statistics Program (ACCSP). While the exact amount of funding is yet to be determined, it is likely there will be a substantial difference between the level of funding needed and the level of funding received. This deficit means other levels of funding will need to be identified and secured. ME DMR highlights the feasibility of 100% reporting, and the date associated with its implementation, are highly dependent on the level of funding received.

V. Electronic Tracking on Federal Vessels

At the April 2019 meeting, ALWTRT members had a cursory discussion regarding electronic tracking on federally permitted vessels. Given this discussion, ME DMR had conversations with law enforcement and industry to gather feedback.

From an enforcement perspective, vessel tracking in federal waters would be a critical tool to ensure new and existing regulations are properly enforced. Offshore fishing areas pose unique challenges to enforcing regulations because the areas are vast. As a result, many hours can be spent searching for gear. Further, Maine Marine Patrol currently has eight patrol vessels with the capability to haul lobster gear in state waters. Of those eight, only

[26] Addendum 26 to Amendment 3 to the American Lobster Fishery Management Plan. http://www.asmfc.org/uploads/file/5a9438ccAmLobsterAddXXVI_JonahCrabAddIII_Feb2018.pdf

four boats have the capability to effectively and safely inspect lobster gear in areas where larger trawls are fished outside of Maine state waters. As a result, Marine Patrol's capability to enforce lobster regulations drops as one moves further offshore.

Industry has expressed many reservations about adopting tracking on federally permitted vessels. These concerns include the cost of the unit, ongoing expenses associated with data plans, whether technical failures of a tracking device would cause boats to be tied to the dock, and whether vessels which already have VMS onboard will be required to have two different tracking units. Given a webinar on vessel tracking, as discussed at the April 2019 ALWTRT meeting, was never held, many questions remain regarding the parameters and potential impacts of this program.

Given industry's concerns and the lack of clarity around a federal tracking program, ME DMR recommends NOAA work with industry to understand the various tracking technologies which are available and to determine the associated costs. As a starting point, ME DMR notes that during the development of Addendum 26 to Amendment 3 to the American Lobster Fishery Management Plan, the ASMFC's Law Enforcement Committee (LEC) spent significant time discussing vessel tracking in the federal lobster fishery. This group produced several recommendations, including the need for a fast ping rate to discern between steaming and hauling. The LEC concluded the ability to distinguish these actions through a tracking device is important because it can indicate where traps are set and for how long. The LEC also noted that real-time data is not necessary in the lobster fishery given traps are set for multiple days; knowing the location of the traps is more important than getting hourly, real-time data. Given these criteria, it may be that a cellular-based tracking device is a better fit for the federal lobster fishery, and it is available at a substantially lower cost. At present, ASMFC is conducting a pilot program with cellular- based tracking devices in the lobster fishery to better understand their performance. This information may be crucial as NOAA begins to engage with the industry on this issue.

VI. Request for Conservation Equivalency

A unique feature of the Maine lobster fishery is that it is based on a system of co- management. The coast of Maine is divided into seven lobster zones in recognition that areas along the coast differ in habitat and traditional fishing practices. Each zone is represented through a Zone Council, which is comprised of fishermen in the region. These Zone Councils are an integral part of the lobster management process within the State.

Under ME DMR's regulations, Zone Councils have the authority to set some measures within their Zone, including exit ratios (number of licenses issued vs. the number of licenses that are not renewed), number of traps fished (as long as this is more conservative than the statewide limit), number of traps on a trawl (as long as it is more conservative than state regulations), and time of day when fishing may occur. Several Zones have used this authority to fit regulations to their region. For example, fishermen in Zone E have adopted a 600-trap limit based on local fishing practices. All fishermen who fish in Zone E, regardless of whether it is their primary zone, are held to the 600-trap limit.

At present, ME DMR's proposal is for all state-licensed fishermen and is not differentiated by Maine's lobster management zones. However, this statewide approach does not acknowledge the acute regional differences in the Maine lobster fishery. Further, it does not consider that Zone Councils may prefer a different combination of measures to achieve the same level of risk reduction. Allowing for future flexibility in the regulations to meet the same level of risk reduction will be crucial to the success of this rule. As a result, ME DMR recommends NOAA Fisheries include an alternative for conservation equivalency within the proposed rule. This will prevent the need for lengthy rule-making process if regional measures need to be adjusted to achieve the same level of risk reduction. Conservation equivalency is a management tool frequently used by the Atlantic States Marine Fisheries Commission and specific guidance has been developed on its implementation and use.[27]

VII. Individual Safety Program

For a small number of fishermen, the measures included in this proposal exceed the physical limitations of their boat and would require the purchase of a new boat to come into compliance. While ME DMR believes these individual cases are few and far between, we do believe they exist. Given the purchase of a new vessel can be cost prohibitive, ME DMR is asking for the flexibility to address these safety concerns on an individual basis. To be clear, ME DMR is not asking that these individuals be exempt from the risk reduction included in this proposal. Instead, ME DMR is asking for the flexibility to address these individual cases in which a fisherman physically cannot comply with the requirements.

For example, it may be that a fisherman does not have the boat capacity to comply with the new trawling-up requirements. ME DMR is requesting the flexibility to develop an individual plan to achieve the same risk reduction at a lower trawling-up scenario. This could include an individual trap reduction and/or the use of full weak rope to compensate for the lower trawl limit.

Maine Marine Patrol would be notified of these individual cases to ensure enforcement and all analysis showing the individual conservation equivalency would be sent to GARFO staff for review.

[27] Atlantic States Marine Fisheries Commission. Conservation Equivalency: Policy and Technical Guidance Document. Approved May 2004; Edited October 2016.
http://www.asmfc.org/files/pub/ConservationEquivalencyGuidance_2016.pdf

3.3.1.1 Appendix I: Maine DMR Risk Assessment Tool

In the absence of a way to quantitatively assess the risk reduction gained by incorporating weak points into vertical lines in Maine, ME DMR developed its own risk assessment tool utilizing many of the same principals and data inputs as NMFS' Decision Support Tool. However, the ME DMR risk assessment tool does not incorporate the results of the gear severity poll. Instead, the DMR calculation relies on data collected by its own vertical line research initiative and peer reviewed literature stating that gear which breaks under 1700lbs of force should significantly reduce the risk of serious injury and mortality in right whales (Knowlton 2015). The primary definition of risk that was presented and discussed at the October 2018 and April 2019 ALWTRT meetings remain the same:

Risk = Whales X Vertical Lines X Threat

ME DMR is proposing measures for vertical line reductions, as well as the insertion of weak points in vertical lines in a manner that differentiates measures by distance from shore. Therefore, the areas calculated in this risk assessment are broken up and presented as follows:

- Exemption line – 3 miles (Ex-3) or non-exempt state waters
- 3 miles – 12 miles (3-12); this combines measures from 3-6 and 6-12 miles
- 12 miles to the Area 1/3 line (12+)

<u>*Whales*</u>

To populate the whale portion of the above risk equation, ME DMR used the annual summed number of right whales per area above from the expanded Duke whale model in the NMFS Decision Support Tool. This is the latest version of the Duke right whale habitat model available. The expanded version of the model pushes right whales inshore past the original extent of the model, which may be inflating numbers in the nearshore areas. This component can easily be updated as changes are made to that input. Up-to-date numbers were received from the Northeast Fishery Science Center at the time of submission of this Plan. Using this method, less than 1% of annual right whale presence in Maine non- exempt waters occurs in state waters between the exemption line and the 3-mile line. Maine federal waters from the 3-mile line out to 12 miles constitutes 11% of Maine's annual right whale occurrence and 88% of Maine's right whale presence is contained beyond 12 miles. This is consistent with ME DMR's strategy to tailor the measures to more offshore areas where there the risk is higher.

It is important to note that ME DMR is evaluating the risk reduction gained by proposed measures for the portion of risk that Maine represents. The annual total of whale days presented above only includes those whales showing up in Maine's portion of the LMA1 in the expanded Duke model. For context, the total number of annual whale days in the domain within the Decision Support Tool is 222,129. As such, Maine represents less than 10% of this total.

<u>*Vertical Lines*</u>

The number of vertical lines in this risk assessment is taken from the Industrial Economics gear model, which is also used for Maine's portion of LMA1 in the NMFS Decision Support Tool. The total used in the calculation is the annual sum of vertical lines present by distance from shore and, therefore, does not represent the number of vertical lines in the water at any one time (the Industrial Economics model is often presented as a monthly average). Using this dataset, 63% of the vertical lines in the non-exempt portion of the Maine lobster fishery are within state waters where most of the fleet is permitted. 29% of non-exempt gear occurs between 3 and 12 miles, while just 8% are fished outside 12 miles.

<u>*Threat*</u>

The calculation of the threat score is where this methodology departs from the NMFS Decision Support Tool. In this analysis the threat of a vertical line to a right whale is assessed as a binary value. The vertical line either poses a risk (breaks higher than 1700lbs) and is assigned a value of 1, or it does not pose a risk (breaks lower than 1700lbs) and is assigned a zero. Vertical lines that break at 1700lbs or less are considered to be zero risk of serious injury or mortality to right whales to maintain consistency with Knowlton (2015). ME DMR's science staff worked collaboratively with the fishing industry in Maine to collect and break more than 200 samples of vertical lines in 2018 and 2019 to determine the functional breaking strength of the gear as it is tied or spliced together in the fishery. The results of that study show that rope of a diameter of 5/16" or less can be considered weak, or reliably breaking below 1700lbs in a variety of vertical line configurations and rope material types (Figure 1).

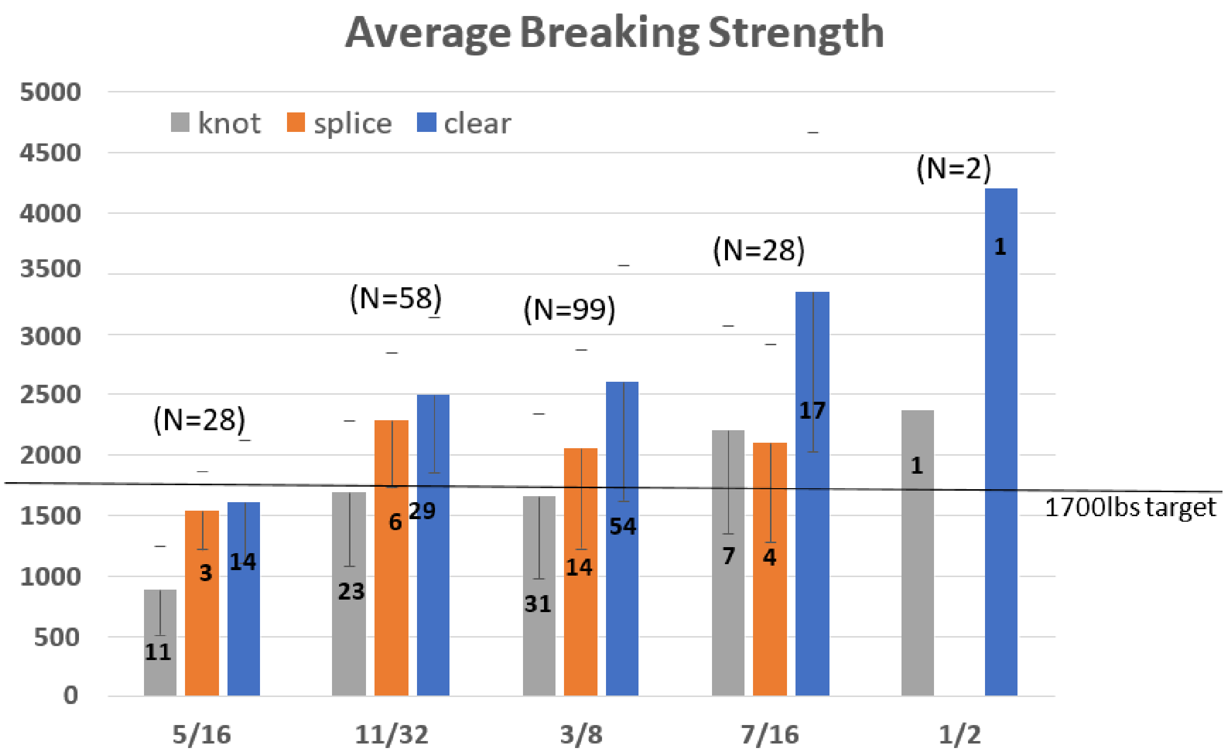

Figure 1. *Breaking strength results of over 200 sample breaks from vertical lines donated by fishermen throughout the Gulf of Maine region. Results are presented in the pounds of force needed to break the line. Results are organized by rope diameter ranging from 5/16" to ½". The varying sample sizes for each diameter and sample type are denoted in the figure. Sample breaks included the knots (grey) or splices (orange) used to attach pieces of rope together to make up the vertical line. Unaltered (no knots or splices) lengths of lines were also broken to show how much a knot or splice reduces the breaking strength. Those breaks are labeled as "clear" in blue.*

Therefore, ropes already known to the be used the fishery that are 5/16" diameter or smaller were considered to already be weak and were removed from the baseline threat score. The use of 5/16" or smaller diameter line was documented by DMR science staff in a survey done collaboratively with the lobster fishery in 2018 on how vertical lines are rigged and fished by area. With more than 800 responses received, DMR was able to document that 14%, 9%, and 6%

of respondents reported using 5/16” or smaller diameter line in non-exempt state waters, 3-12 miles, and 12+ miles respectively (Figure 2).

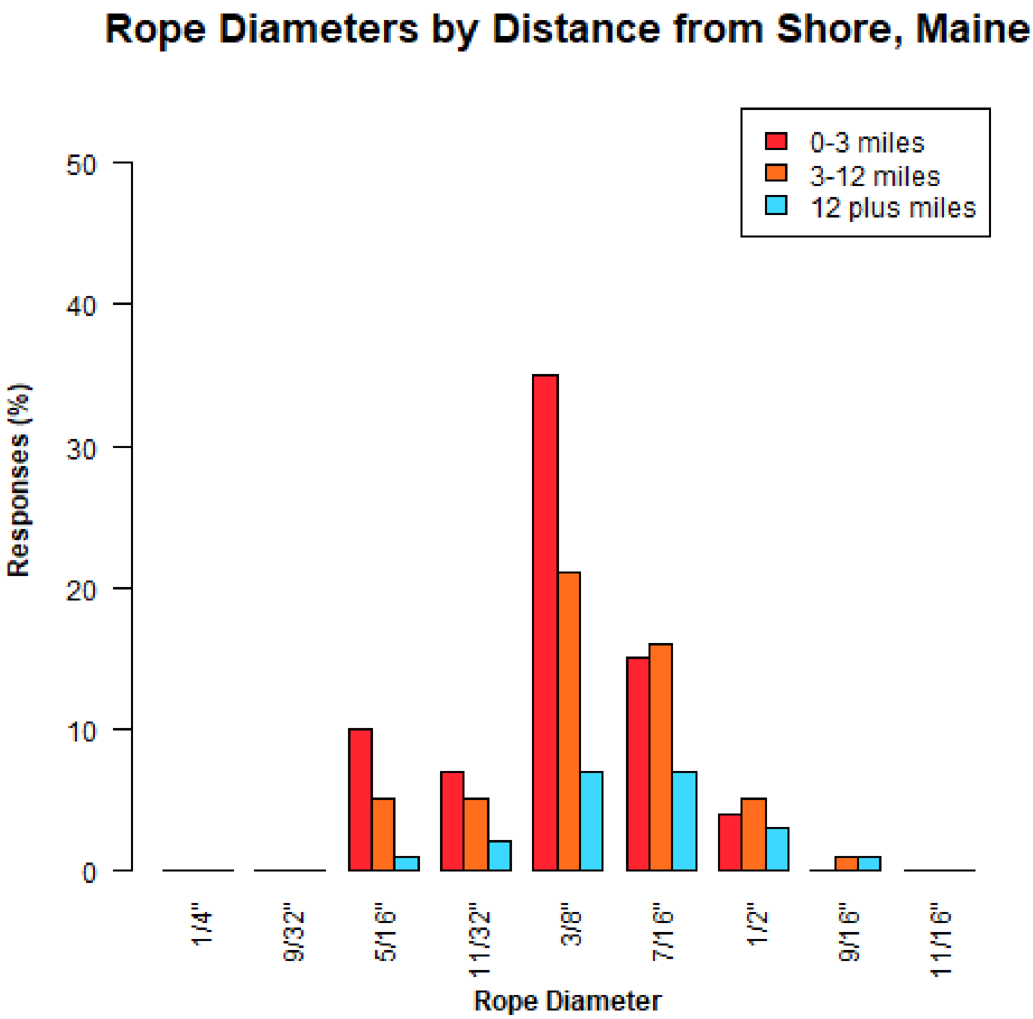

Figure 2. *The percentage of responses to the ME DMR vertical line gear survey in 2018 that reported fishing with specific diameters of rope arranged by distance from shore.*

The baseline use of weak (5/16” or smaller diameter rope) vertical lines was taken into account in the risk analysis, which acts to lower the amount of risk reduction that is received for adding weak points to lines in different areas. For example, 14% of vertical lines are already assumed to break below 1700lbs in non-exempt state waters. Therefore, no risk reduction credit is given to 14% of the vertical lines in that area when calculating the risk benefit gained from adding weak points to vertical lines. The remaining 86% of lines in that area that are currently fished using ropes that break over 1700lbs can be used to calculate a risk reduction by adding weak points. All vertical lines using rope diameters larger than 5/16” were given a risk score of 1.

The Baseline

The baseline amount of risk associated with non-exempt waters in Maine’s portion of LMA1 is calculated by area using the above definition of risk and multiplying the annual sum of whales, the annual sum of vertical lines, and the % of vertical lines breaking above 1700lbs and therefore posing a threat.

This was done by distance from shore so that different measures in those areas could be assessed against the amount of relative risk posed by that area. As seen in Table 1, non-exempt state waters accounts for 4% of Maine's relative risk of entanglement, while federal waters from 3-12 and 12+ account for 30% and 66% respectively.

Table 1. *The baseline annual sum of whales, vertical lines, and lines breaking above or below the 1700lb threshold by distance from shore in Maine non-exempt waters. Trends show that while the majority of the vertical lines are closer to shore, 88% of the annual total of whales occurs outside of 12 miles in Maine. Additionally, more of the vertical lines closer to shore utilize rope diameters 5/16" or smaller and, therefore, pose no risk to right whales. These two factors contribute to 66% of Maine's relative risk of entanglement to right whales being concentrated offshore beyond 12 miles.*

	Baseline							
	Whales		**Vertical lines**		**Threat of Vertical lines**		**`Risk**	
	AnnualSum	Percent	AnnualSum	Percent	Percent<= 1700	Percent> 1700	W*VL*T = R	Percent
Ex-3	166	0.8%	934,924	63%	14%	86%	133,376,203	**4%**
3 to 12	2,369	11%	430,414	29%	9%	91%	932,309,353	**30%**
12+	18,474	88%	118,370	8%	6%	94%	2,048,096,772	**66%**
Totals	**21,009**		**1,483,708**				**3,113,782,327**	

Risk Analysis

To calculate the change in risk associated with measures in the ME DMR proposal, the same calculation can be done with a few changes to represent the impact of the proposed measures. The whale annual sum by area remains the same between the two calculations. In this scenario, the vertical line totals are reduced in each area by the percentage reduction gained by the relative trawl minimums being proposed. In the proposal this results in vertical line reductions of 25%, 21%, and 28% in non-exempt state waters, 3-12miles and outside 12miles, respectively. Lastly, the threat score is altered to account for the vertical lines that will have weak points built in to break the line at 1700lbs or less. The ME DMR proposal would implement a weak point into all vertical lines in state waters 50% of the way down the line. In federal waters from 3-12 miles, fishermen would be required to add two weak points into each vertical line, with none being required more than 50% of the way down the line. Outside of 12 miles from shore, one weak point would be required 1/3 of the way down the vertical line. To include this measure in the calculation, all vertical lines were considered weak by the proportion of the way down the vertical line that the lowest weak point is required. The analysis assumes that any right whale entanglement in the top half of the vertical line will break the line at a designated weak point and free the whale, avoiding serious injury and mortality.

Table 2 summarizes how the risk calculation changes when proposed measures are implemented.

Table 2. *The resulting risk calculation with changes made for proposed risk reduction measures. Changes include a drop in vertical lines by area resulting from trawling-up regulations, and a gear threat in each area proportional to the location of the lowest weak point required.*

	Whales Annual Sum	Vertical Lines Annual Sum – % reduction	Threat % not Weak	Risk W*VL*T
Ex-3	166	701,193	50%	58,199,007
3 to 12	2,369	340,027	50%	402,761,703
12+	18,474	85,227	66%	1,039,153,100
	21,009	**1,126,446**		**1,500,113,809**

Relative risk reduction achieved by the proposed plan:
Risk reduction = 1 – (Proposal Risk/Baseline Risk)
Risk Reduction = 1 – (1,500,113,809/3,113,782,327) = 52%

3.3.1.2 Appendix II: Letter to NOAA re Technical Memo

STATE OF MAINE
D EPARTMENT OF M ARINE R ESOURCES 21 STATE
HOUSE STATION
AUGUSTA, MAINE 04333 - 0 0 2 1

PAUL R. LEPAGE
GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

October 3, 2018

Dear Dr. Hare,

I am writing in response to the recently released NOAA Technical Memorandum NMFS-NE-247, *North Atlantic Right Whales—Evaluating Their Recovery Challenges in 2018* ("Technical Memo" or "Memo"). Regrettably, I have significant concerns about the scientific merit of this document, which I have documented below in detail.

As I am sure you'll agree, any measures developed to protect right whales must be based on sound science in order to be effective. For this reason, it is imperative that the Technical Memo provide a comprehensive picture of the best available science to inform the critical decisions that the TRT is being asked to make. The title of the Memo implies a comprehensive look at all stressors across the right whale's range. While many category I and category II fisheries from Maine to Florida are regulated under the Atlantic Large Whale Take Reduction Plan, the content of the Memo is almost exclusively limited to the lobster fishery in the Gulf of Maine. There is little context offered for how right whales are utilizing expanded habitats in Canadian and Mid-Atlantic waters, and how that changing range and interactions with other fisheries affects risk of entanglement. Absent this information, any discussion on new regulations will be based on an incomplete picture, and provide uncertain benefit to whales. It is my sincere hope that you will endeavor to update and correct this document expeditiously, as we anticipate its use to inform the work of the Atlantic Large Whale Take Reduction Team (ALWTRT) at its upcoming meeting in Providence.

Overall, the Memo is inconsistent in its application and interpretation of various data sets and publications. In some cases, conclusions directly contradict statements and information previously presented by NOAA. In several instances, the paper lacks citations or cites inappropriate sources (i.e. industry documents instead of raw data; unpublished articles) and appears to be stating conclusions or opinions without any supporting data (i.e. that the 2015 vertical line regulations are making entanglements worse). Our most substantive concerns are addressed below but please note that this list does not represent an exhaustive list of the issues we identified, which range from minor technical points to omissions of core data sources.

First and most significantly, the Memo suggests that the 2015 vertical line regulations increased the strength of rope and therefore the severity of entanglements by altering fishing practices and encouraging the use of larger diameter ropes as vertical lines. There are no current data sets or analyses used to support this theory. The paper instead cites Knowlton et al. 2016. While the Knowlton paper accurately characterizes the change in rope strength through manufacturing processes over time, the data used encompass the years 1994-2010. This time period was largely before any of the substantial changes in gear due to regulations, such as the sinking groundline regulation in 2009 and the vertical line rule in 2015, and overlapped with a time period in which right whales actually saw population increases. There has been no recent assessment that states that fishermen have been using larger diameter rope in response to the vertical line regulations in 2015.

Additionally, to our knowledge, there is no published analysis of ropes taken from right whales that includes the time period since the vertical line regulations went into effect in 2015, nor any assessment of the efficacy of those regulations. The most recent publication that details current instances of entanglements that resulted in serious injuries or mortalities, NOAA's "Serious Injury and Mortality Determinations for Baleen Whale Stocks Along the Gulf of Mexico, United States East Coast, and Atlantic Canadian provinces, 2011—2015" (Ref Doc. 17-19) was published in 2017 and relies on data from 2011-2015 (prior to the implementation of the vertical line rule). Instead of using this most recent agency source, the Memo repeatedly cites Knowlton et al. 2012 to point out the increasing rate of entanglements and that 83% of the population has been entangled at least once. Knowlton et al. 2012 is a comprehensive 30-year retrospective of the right whale catalogue but does not provide an assessment of entanglements in the right whale population beyond 2009. While it is indisputable that entanglements are increasing, a more recent assessment would provide a more accurate picture of the current threats facing right whales, which are changing rapidly. In fact, due to the lack of data on this critical question, NOAA recently funded DMR's current research project to improve understanding of gear usage, hauling load and vertical line breaking strength. In sum, the Memo fails to take a comprehensive look at how entanglement rates and severity have changed since the implementation of the sinking groundline and vertical line regulations went into effect in 2009 and 2015, respectively, nor does it assess changes or trends in entangling gear during that time period. It is therefore an unreliable assessment of current regulations.

Second, the Memo cites increased Maine landings to indicate increased effort. Most importantly, landings are not a proxy for effort, and have never been used as an accepted metrc for increased risk of entanglement. The Memo cites Maine state landings data to demonstrate increased effort offshore without describing where the data apply in terms of fishing areas. It uses these landings to assert that
there is an increased overlap and therefore level of risk "offshore." The data provided by DMR staff represents landings generated from logbooks from 10% of randomly selected harvesters licensed by the state. Contrary to the assertion made in Figure 2c, Maine logbook reported landings have increased both inshore (which we define from 0-12 miles) and offshore (from 12 miles to the Area 1 boundary), but, when comparing the two areas, the inshore portion has increased at five times the rate of the offshore area. It appeared, from the webinar held at the time of publication, that NOAA interpreted "offshore" as being out to the Hague Line (based on the webinar presenter's interpretation of heat map slides, which are not included in the Memo).

These heat maps interpolate VTR data for lobster. While Area 3 has 50- 100% of Federal licenses reporting through VTRs (ASMFC TC Memo July 2015), most Area 1 Federal lobster permit holders are exempt from VTR requirements and those with permits required to report represent less than 10% of Maine Federal permit holders and 3% of the total license holders in Maine (ASMFC TC Memo January 2017). Maine has only a handful of Area 3 license holders (permitted by NOAA), and the majority of effort that we categorize as being beyond 12 miles would end at the Area 1/3 boundary, approximately 40 miles from the coastline. Area 3 VTR data could characterize "offshore" effort but was not used in the Memo. It is unclear why NOAA would choose to use state landings records for only one state that is dominated by inshore effort if seeking to accurately characterize offshore effort, as the majority of the truly "offshore" effort (in Area 3) is from permitholders in other states.

While the State of Maine recognizes that the size of our fishery is the reason for the focus on our impact to right whales, effective management measures will require a clear picture of changing population distribution and abundance in recent years. The Memo repeatedly points to an expanding range and increasing overlap with fisheries as sources of increased risk. It notes decreased observations of right whales in the Gulf of Maine and Bay of Fundy during the summer months and southeast coast in the winter, and increased presence in the Gulf of St. Lawrence in the summer and off the mid-Atlantic in the winter. Despite the changes in distribution, the only fishery considered for "increased" overlap is the Gulf of Maine lobster fishery, despite the parallel assertion that the Gulf of Maine is an area of decreased presence and the fact that NOAA's own observation resources have been diverted to Canada because of this shift. There is also little assessment of the unregulated fisheries they encounter in the Bay of Fundy, on the Scotian Shelf and into the Gulf of St. Lawrence, or the devastating interactions that resulted when right whales overlapped with changes in the snow crab fishery in 2017.

Additionally, there is no discussion of the role of other US regions or fisheries despite the fact that the Memo states that right whales are increasingly using other areas, such as the mid-Atlantic. Furthermore, the Memo includes little discussion of the impact of other U.S. or Canadian fisheries on right whales. All vertical lines do not present the same level of risk; the location, the season, the type of gear, and whether it incorporates conservation regulations (e.g. the use of weak links and sinking line in surface systems) all factor into the level of risk posed by a given line. Additionally, lines that overlap with right whale feeding aggregations inherently pose more risk of entanglement. A shift in habitat use out of the Gulf of Maine and into Canadian waters does not double risk, but rather it shifts the spatial intensity of the risk that exists. The Memo does not cite evidence for the assertion that closures are regionally effective, nor does it cite any basis for Figure 4's assertion that vertical lines have increased in the Northeast since 2011. In fact, this claim directly contradicts a presentation made by Mark Murray- Brown to the New England Fishery Management Council in December 2017, pointing to the reduction of 2740 miles of vertical line achieved through implementation of the 2015 regulations.

There are additional instances where a more comprehensive data set is available but inexplicably not used. For example, Figure 5 seems to be trying to show the relevance of the lobster fishery in entanglements, but most of the entanglements shown are from years prior to when the sinking groundline and vertical line rules were implemented. This Figure shows only those entanglements where the set locations are known, and it is unclear whether it shows all entanglements or only those resulting in serious injury or mortality. Notably absent from the Memo is any reference to the much more robust dataset curated by NMFS that documents entanglements to confirmed fisheries, which would provide a much more comprehensive look at the causes of entanglements across the right whale's range. Use of this dataset would also allow a look at how entanglements have changed, either by the confirmed fishery to which the entanglements are attributed, or by characteristics of the rope (i.e. diameter) over time. Two of the entanglements in Maine shown on this map also fail to note that Maine lobster gear was the secondary cause of entanglement. The use of range-wide, recent fishery confirmed instances of entanglement would inform consideration of what measures would most effectively curtail the current entanglement problem. Focusing on only entanglements where the set location is known drastically limits an already small dataset and could result in the misalignment of new regulations with the current entanglement risk.

I strongly believe the Maine lobster industry takes the threats to right whales seriously and will work to identify a meaningful solution appropriate to the risk posed by their fishery under current biological and environmental conditions and considering past regulatory actions. However, conclusions based on conjecture, without sound scientific basis, will alienate their critical participation in this process. The net result of the oversimplified picture painted by this Memo is likely to be regulations imposed on a fishery or in an area that will result in very little conservation benefit for the right whale but will come at a great cost to the fishermen in terms of money, time, and safety.

I look forward to working with you and your staff to improve the accuracy of the information which will inform the ALWTRT's work going forward. If you have any questions or would like to discuss this further, please contact Erin Summers, email: erin.l.summers@maine.gov; telephone: (207) 633-9556.

Sincerely,

Patrick C. Keliher Commissioner

Cc: Mike Pentony, Regional Administrator, Greater Atlantic Regional Office Mike Asaro, Protected Resource Division, Greater Atlantic Regional Office

3.3.1.3 Appendix III: Letter to NOAA re Decision Support Tool

MAINE DEPARTMENT OF MARINE RESOURCES
NEW HAMPSHIRE DEPARTMENT OF FISH AND GAME

April 19, 2019

Michael Pentony Regional Administrator
National Marine Fisheries Service 55 Great Republic Drive Gloucester, Massachusetts 01930

Dear Mr. Pentony,
Next week, the Atlantic Large Whale Take Reduction Team (ALWTRT) will be meeting with the goal of recommending a suite of measures to reduce the rate of serious injury and mortality (SI&M) of North Atlantic right whales to below Potential Biological Removal (PBR). The measures developed at this meeting have the potential to substantially impact several important fisheries, including the American lobster fishery which is an economic cornerstone of many New England communities. As a result, the states of Maine and New Hampshire have been actively engaged on the ALWTRT, its sub-groups, and in conversation with NOAA Fisheries. Our primary objective has been to provide the most relevant data possible so resulting measures can target areas of high risk and yield the greatest conservation benefit possible for right whales. Unfortunately, the weeks leading up to this meeting have raised serious concerns about the ability to thoughtfully make these recommendations. Specifically, NOAA Fisheries has been inconsistent in its message on the analysis that will be provided to the ALWTRT, executed poor time management in holding sub-group meetings and developing tools, provided insufficient time for stakeholders to review newly developed models, and compromised the thoughtfulness and thoroughness of the analysis needed to support important decisions. This has hindered the states' ability to prepare for the ALWTRT meeting, and solicit the participation and engagement of the fishing industry.

A key component of the upcoming ALWTRT meeting appears to be a new decision support tool, or Risk Reduction Model. While the two states agree the development of this type of tool is needed and applaud NOAA Fisheries for engaging a modeler familiar with the lobster fishery, the states have concerns about the components of this model, its documentation, and its lack of external review. As of the writing of this letter, no documentation on the model has been provided to the ALWTRT. Consequently, states are being asked to attend the ALWTRT meeting without an in-depth understanding of how the model works or how it translates management measures into a reduction of risk. In addition, conversations with NOAA Fisheries staff indicate this model has not been peer-reviewed. Given the model appears to have been developed a few weeks prior to the ALWTRT meeting, stakeholders are being asked to develop consensus management measures based on a model which was developed under unreasonably tight deadlines, has no documentation, and has not been peer reviewed.

Known components of the Risk Reduction Model further raise concerns about the outputs of this product. On April 7th just two weeks before the upcoming meeting, ALWTRT members were asked to complete a survey ranking the relative risk of different gear configurations and modifications. Communications with NOAA Fisheries indicate results of this survey are an important component of the model in determining "Severity" when evaluating the risk to whales (Risk = Whales * Gear Density * Severity). While the New England states are not opposed to the use of polling as a tool to capture the ALWTRT's expertise, the states are opposed to the use of a survey which has not been developed or reviewed by a social scientist. As a result, the states believe the risk value for various gear configurations should also be informed by gear taken off entangled whales. We acknowledge only a subset of entanglements have gear that can be analyzed; however, there are relevant trends which can inform the risk that different gears pose, such as the decline in the prevalence of 3/8" rope in SI&M cases. In contrast, cases with rope diameter greater th.an 3/8" account for 88% of the total Sl&M since 2010[1].

In addition, the states review of Jason Robert's habitat model (Duke Habitat Model), another component of the new Risk Reduction Model, raises concerns about the utility of this data source in New England. While documentation provided on the Duke Habitat Model notes the model was updated with data through 2016, an in-depth look at the data elements shows much of the recent infonnation is from the mid-Atlantic region. Specifically, data on the distribution of whales in New England (minus Cape Cod Bay, which is being updated for the ALWTRT) has only been updated through aerial surveys completed through 2013. ln addition, standardized shipboard surveys are largely absent from the Gulf of Maine. This leaves much of the Gulf of Maine relying on the modeled distribution of right whales, which uses climatological data when there is little effort and low sightings. There are plans to update the Duke Habitat Model with more recent surveys, possibly find ways to incorporate opportunistic sightings, and split the time period to pre- and post-2010. However, none of these enhancements will be completed on a timeframe that is relevant for the upcoming ALWTRT meeting. Thus, due to the changing distribution of right whales since 2010 (Davis *et al.* 2017[2]), the current data elements in the Duke Habitat Model are no longer relevant in New England as they do not reflect current right whale habitat use.

The compilation of these concerns has resulted in the states questioning the Risk Reduction Model's outputs. Our understanding of the model is that areas of high risk are determined by the presence of both right whales and fishing gear. NOAA Fisheries staff noted that the region south ofNantucket, which has recently been under much scrutiny due to the high number of whales in the region, is characterized as low risk in the model because of minimal fishing gear. Interestingly, the reverse

[1] NMFS Large Whale Entanglement Reports; NMFS Mortality and Serious Injury Reports.

[2] Davis, G.E., Baumgartner, M.F. and S.M. Van Parljs. 2017. Long-tenn passive acoustic recordings track the changing distribution of North Atlantic right whales *(Eubalaena glacialis)* from 2004 to 2014. *Scientific Repots, 1,* Article number: 13460.

does not seem to hold true; areas of high gear density but low whale presence, such as mid-coast Maine, are characterized as having a high level of risk in the model. Unfortunately, with less than a week to the ALWTRT meeting, there is no space in the current timeline to raise these anomalies and brainstorm ways to fix them prior to having to use the model for decision making purposes. As a result, team members are being asked to develop proposed measures based on a model that was not complete prior to the ALWTRT meeting and whose outputs prompt substantial questions. As a result, the states request the Risk Reduction Model be fully documented for members of the ALWTRT and an external peer review be conducted before final decisions based on the model are made.

In addition to questions about the development of the Risk Reduction Model, the states are also troubled by the risk reduction target outlined by NOAA Fisheries in an April 5th email to the ALWTRT. A description of the calculations for the risk reduction target indicate 50% of the unattributed cases of SI&M are assumed to be a result of US fisheries; however, recent entanglement data suggests Canadian fisheries are responsible for an increasing portion of SI&M. For example, 2013-2017 data suggests US fisheries were responsible for 0.2 of the SI&M to right whales while Canada was responsible for 1.4[3]. This trend continues in 2014-2018, where data suggests US fisheries were again responsible for 0.2 of the SI&M while Canada was responsible for 1.64. Given this information, the states assert the current risk reduction target is inappropriate and should be reconsidered. An email sent to the ALWTRT on April 18th indicates other approaches to calculate the target risk reduction were considered; however, minimal rational is provided in the email for the method ultimately chosen. If, as data suggests, Canada is now the primary source of SI&M for right whales, draconian measures in US fisheries will not ensure a successful reduction of SI&M below PBR for the range of North Atlantic right whales.

Inconsistency in NOAA Fisheries' communication regarding the upcoming ALWTRT meeting has also severely hampered the states' ability to interact with the fishing industry. On March 18th, the Regional Administrator announced NOAA Fisheries would be developing a strawman proposal ahead of the ALWTRT meeting to provide stakeholders with the scope of potential management changes. On April 4th, this course of action abruptly changed as, on an Atlantic States Marine Fisheries Commission Lobster Plan Development Team call, NOAA Fisheries stated they would not be providing a strawman proposal and would instead be relying solely on the new Risk Reduction Model. This unexpected change of direction was not only confusing to the state agencies but also disrupted planned preparations for the ALWTRT meeting. Due to inconsistent messaging from NOAA Fisheries, the state of Maine cancelled three industry meetings that had been planned to provide clear direction to, and solicit input from, the lobster fishing industry. Given the Risk Reduction Model is not available for review, these meetings will not be re-scheduled prior to the ALWTRT meeting because states do not have the tools needed to assess various management measures and hold productive industry conversations.

[3] NMFS Large Whale Entanglement Reports; NMFS Mortality and Serious Injury Reports.
[4] NMFS Large Whale Entanglement Reports; NMFS Mortality and Serious Injury Reports.

Finally, the two New England states raise serious concerns about NOAA Fisheries timeliness regarding preparations for the April ALWTRT meeting. The ALWTRT previously met in October 2018 and, at that meeting, developed a work plan for NOAA Fisheries to complete prior to the next meeting. The states recognize an extended federal government shut-down delayed progress on necessary analysis; however, the spring ALWTRT meeting was also postponed by over a month due to this shut-down. The states note the first sub-group meeting of the ALWTRT was not held until March 25th a reduction target was not announced until April 5th, a presentation of the Risk Reduction Model was not given until April 16 th, and a :final working model was not available to the ALWTRT prior to the meeting. As a result, the states are concerned about the thoroughness and thoughtfulness of the analysis being conducted given the time constraints. In addition, NOAA Fisheries has commented that they intend to move straight into rulemaking following the ALWTRT meeting. This timeline perpetuates the states' concerns given if further truncates the time for appropriate review and ensures rushed and unreviewed analysis will be immediately used to promulgate regulations.

The states of Maine and New Hampshire recognize difficult decisions need to be made to ensure the conservation of North Atlantic right whales; however, the states have concerns about the analysis directing the conversations and consensus recommendations, and the timeliness of rulemaking. While the states have sought to be thoughtful contributors to this important discussion, the actions of NOAA Fisheries have undermined the state's ability to engage on this issue and severely dampened the voice of the fishing industry.

The two states request the Risk Reduction Model be completely documented for review by the state' s fisheries managers, and the full ALWTRT, and an external peer review be conducted before :final decisions based on results of the Risk Reduction Model are made.

Sincerely,

Pat Keliher
Commissioner, Maine Department of Marine Resources

Doug Grout
Chief of Marine Fisheries, New Hampshire Department of Fish and Game

3.3.1.4 Appendix IV: Letter to NOAA re Scoping

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GOVERNOR

PATRICK C. KELIHER
COMMISSIONER

Michael Pentony Regional
Administrator
National Marine Fisheries
Service 55 Great Republic
Drive Gloucester,
Massachusetts 01930

September 16, 201

Dear Mr. Pentony,

The Maine Department of Marine Resources (ME DMR) appreciates the opportunity to comment on the upcoming rule-making to amend the Atlantic Large Whale Take Reduction Plan (ALWTRP).

Proposed changes to the ALWTRP are likely to have large impacts on Maine's lobster fishery, the social and economic backbone of Maine's coastal and island communities. In 2018, landings from the Maine lobster fishery were valued at over $486 million and a recent economic study determined the fishery has an economic impact of an addition $1 billion annually[1]. This fishery not only encompasses the roughly 4,800 lobster license holders and 1,100 student license holders but also sternmen, dealers and distributors, bait dealers, and trap builders who contribute to this fishery and their communities. Understanding the full impact of these pending regulations on the Maine lobster fishery, and to the North Atlantic right whale population, will be critical to ensure the appropriate suite of measures is implemented.

A. Characteristics of the Maine Lobster Fishery

The Maine lobster fishery is comprised of a diverse set of vessels, fishermen, and fishing practices. According to data collected in 2018, roughly 20% of vessels registered to Maine lobster license holders are less than 18 feet in length while 10% of vessels are greater than 39 feet in length. Thus, most fishermen who participate in the lobster fishery use smaller boats and typically fish close to shore. In addition to length, vessels in the Maine lobster fleet vary in their construction and layout. Smaller vessels, less than 25 feet in length, tend to be outboards and have extremely limited deck space for the temporary storage of gear. Some boats have open sterns which allow individual traps, or trawls, to be easily set off the back of the vessel.

[1] Lobsters to Dollars: The Economic Impact of the Lobster Distribution Supply Chain in Maine by Michael Donihue, Colby College. June 2018.

However, other boats have closed sterns, requiring traps to be set over the side of the boat. As a result, safe and fishable trawl lengths are not only dictated by the size of the vessel but also its construction.

Fishing practices within the Maine lobster fishery vary between the eastern and western ends of the State, and between inshore and offshore fishermen. In most state waters, the average trawl length can be characterized by singles, doubles, and triples; however, this masks important regional differences.

For example, as a long-standing convention, fishermen in Casco Bay often fish trawls with two endlines. In this area, recreational and commercial boat traffic is very high and, as a result, fishermen can experience significant buoy loss. Longer trawls allow these fishermen to reduce their number of buoy lines and minimize their potential loss. In contrast, fishermen in mid-coast Maine tend to fish smaller trawl lengths which allow for a higher degree of precision to set traps on specific ledges and cracks, the preferable habitat of lobsters. This increases a fisherman's trap efficiency. An added benefit of fishing singles, pairs, and triples is that it reduces potential gear conflicts between other fishermen if, and when, traps are set over one another. In federal waters, trawl lengths increase, in part due to existing regulations in the ALWTRP. In some of Maine's furthest fishing grounds (outside of 12 miles from shore), trawl lengths average around 15 traps per trawl.

Fishing operations also differ by the number of crew onboard. 29% of license holders have a Class I license, which allows only the individual named on the license to participate in lobster fishing.
Therefore, at a minimum, a quarter of the fleet operates without an unlicensed crew. 39% of Maine lobster fishermen have a license which allows for one unlicensed crew member onboard while the remaining 32% have a license which allows 2 unlicensed crew onboard.

Landings in the Maine lobster fishery have spatial and regional patterns. While the pounds of lobster landed vary across the State, most landings occur within state waters. In 2008, 81% of pounds landed were harvested within three miles of shore. Federal waters, broken up by 3 to 12 miles and outside 12 miles from shore, landed 15% and 4% of the pounds in that year, respectively. Recently, the pattern of catch based on distance from shore has slightly shifted, with an uptick in federal waters landings. In 2016, state waters accounted for 68% of the pounds landed, while 3 to 12 and beyond 12 miles accounted for 23% and 9%, respectively. This pattern of landings does not, however, equate to an identical shift in effort offshore. Between 2008 and 2016, the number of trips recorded within state waters dropped by only 7%, while the number of trips outside 12 miles increased by just 3%.

B. Management Tools Considered

At the April Atlantic Large Whale Take Reduction Team (ALWTRT) meeting, several management tools were discussed which could reduce the risk of serious injury and mortality from entanglements. Some of the tools considered included: area closures, dynamic management areas, trap reductions, vertical line reductions, and 1700 pound rope. Following the ALWTRT meeting, ME DMR reviewed the measures to understand the potential conservation benefits to right whales versus the burden to fishermen. The intent was to consider a range of measures, and then take the most viable options out to industry for feedback.

ME DMR held seven industry meeting to get input from fishermen on the feasibility and implications of these management tools. Based on our internal analysis and the feedback obtained through industry meetings, the following comments are offered regarding the various management tools.

Area closures were proposed and discussed at the ALWTRT meeting but were ultimately not included in any of the final recommendations. Following the ALWTRT meeting, ME DMR continued to discuss the potential efficacy of area closures. Ultimately, ME DMR did not include an area closure in the June 2019 presentation (see Appendix I) to industry due to several pertinent concerns. First, the efficacy of area closures relies on the assumption that gear within the closure is brought to shore. While this assumption holds true in the existing Cape Cod Bay closure due to its timing and location, the same assumption would not hold in Maine waters. Offshore fishermen deploy gear year-round, moving traps to various fishing grounds as lobsters respond to environmental changes. As a result, a federal waters closure, akin to some of the proposals discussed at the ALWTRT, would not result in traps taken out of the water but may instead result in fishermen moving gear to the boundaries of the closure, concentrating gear around an area intended to protect right whales. This 'curtain effect' may have the unintended consequence of increasing vertical line densities in areas of known right whale distribution.

Industry members also asked about the potential conservation benefits of a seasonal closure during the spring months in state waters. After conducting analysis, ME DMR found negligible reductions in risk through this type of measure given right whales are infrequently sighted in state waters and there is minimal lobster gear set during the spring months. As a result, a spring state waters closure resulted in more of a paper exercise than a meaningful conservation benefit for right whales. ME DMR found specific areas and times for closures which resulted in a meaningful risk reduction were hard to define due to a lack of right whale sightings, and their more diffuse and changing use of the habitats in the Gulf of Maine.

Also discussed at the ALWTRT meeting were dynamic management closures. A potential benefit of this approach is that protections are enacted only when right whales are present, lessening the burden on industry. ME DMR considered this approach but quickly came up with several concerns regarding their effectiveness in protecting right whales. The primary concern is that dynamic management is reactive; it relies on right whales being spotted to enact a management response.

Given right whales are notoriously hard to observe and weather conditions along the Maine coast can impede sighting efforts, ME DMR questioned the ability to effectively patrol northern Gulf of Maine waters and spot whales. Furthermore, the resources needed to support successful dynamic management are intensive and expensive, raising concerns of whether dynamic management is a long-term solution for right whale protection. Ultimately, ME DMR concluded measures which can provide year-round protections to right whales are stronger given all whales are positively impacted, not just those sighted.

The ALWTRT briefly discussed trap reductions at its April meeting, particularly those that are ongoing in Lobster Management Areas 2 and 3. ME DMR evaluated the potential benefit of trap reductions as a right whale protection measure and presented these findings to the lobster industry to get feedback. The most frequent concern raised by industry regarding trap reductions was that the ratio between vertical lines and traps is not one-to-one. This means that, particularly offshore, a substantial trap reduction is needed to see a modest reduction in the number of vertical lines.

Industry expressed concern that, as a primary management tool to save right whales, trap reductions could result in large economic consequences due to reduced catch and revenue. Others noted that focusing on trap reductions is ancillary to the conversation since it is vertical lines, not traps, which pose a risk to whales. In addition, the diversity of Maine's lobster fleet, as well as varying levels of participation, make it challenging to implement a trap reduction which does not result in some individuals increasing their effort. This was the result of a substantial trap reduction in 1997; some individuals removed gear from the water while others increased their effort up to the new limit.

One of the primary management tools ME DMR discussed with industry was vertical line reductions via trawling-up. After analyzing many of the potential management tools, trawling-up appears to provide some of the strongest benefits; namely, it addresses serious injury and mortality considered under the Marine Mammal Protection Act as well as risk under the Endangered Species Act. Further, it directly addresses the cause of entanglements: vertical lines in the water column. At the June industry meetings, a series of trawling-up scenarios were presented to industry. These ranged from doubles to quads in state waters and from twenty to forty trap trawls offshore. In response, industry provided critical input on the extent of trawling-up which is feasible and safe in the Maine lobster fishery. Specifically, while offshore fishermen expressed some ability to add traps to an existing trawl, they expressed grave concerns about moving to thirty or forty trap trawls. Several noted that only a few boats are safely equipped to handle forty traps, in addition to the mile of rope needed to fish at these trawl lengths. As a result, requiring fishermen to operate beyond their boat capacities would result in dangerous fishing practices and the loss of human life. Inshore fishermen also highlighted that trawling-up scenarios need to consider the feasibility of smaller boats, particularly skiffs, which have limited deck space and are often operated by a single individual. Moreover, fishermen noted that, at longer trawl lengths, those who operate alone may have to hire a crew.

Outside of safety concerns, fishermen also provided insight on the potential consequences of trawling-up on fishing operations. First, longer trawls may increase gear conflicts and gear loss as there is a higher chance of trawls being set over one another. Second, longer trawls may decrease a fisherman's ability to maneuver traps on to specific ledges and cracks which produce high catch rates. This would reduce a trap's efficiency. Third, industry highlighted that fishermen frequently move traps across regulatory boundaries (i.e. the three mile line, the six mile line, etc.). This movement needs to be considered to ensure ongoing fishing practices and new regulations are congruent. To this end, fishermen suggested that any trawling-up scenario differentiated by distance from shore be comprised of multiples of one another so trawl lengths can easily be extended or shortened. In addition, law enforcement personnel were asked to provide input on the feasibility of enforcing long trawl lengths; they noted that, with the current platforms available, it would be nearly impossible for enforcement to safely haul long trawls to check compliance with the ALWTRP and lobster resource management measures.

Finally, the implementation of 1700 pound rope was also considered by both the ALWTRT and ME DMR. One advantage of 1700 pound rope is it offers a level of protection for all lines left in the water and can substantially reduce the occurrence of a serious injury or mortality which results from an entanglement. However, it does not address the risk of an entanglement occurring. In its June industry meetings, ME DMR presented 1700 pound rope as a potential management tool for consideration. At the time, ME DMR presented this as 75% topper in federal waters. It became clear from several comments that, to accommodate a 75% topper, fishermen intended to increase the length of their vertical line to ensure there was enough rope strength at the bottom where the strain of hauling traps is highest. This result would be counter to the efforts of the ALWTRT and a clear example of the unintended consequences which can result from management action. Instead, several industry members felt that, with existing vertical line lengths, modifications to the top 50% of the rope would be more feasible. Industry also commented that 1700 pound rope should be achieved through modifications to existing rope, as opposed to requiring fishermen to buy new rope. This could be achieved through specific splices or the threading of existing swivels into the rope to achieve a 1700 pound breaking strength. Law enforcement personnel also provided guidance on the enforceability of 1700 pound rope. They noted a specific number of weak points in a rope is more enforceable than 1700 pound rope regulations based on depth fished or the length of the vertical line. They also highlighted that enforcement of a rope diameter, as a proxy for 1700 pound rope, would be challenging since rope can expand in the water and differs by manufacturer.

C. Gear Marking

It is widely recognized that one of the biggest challenges faced by the ALWTRT when discussing the entanglement of right whales is the lack of data on the source of entanglements. This creates large amounts of uncertainty about which fisheries and regions are contributing to serious injury and mortality. At its industry meetings in June, ME DMR proposed a Maine-only purple gear mark to the lobster industry. This purple mark would replace the current red mark used to distinguish the Northeast trap/pot fishery and would allow Maine to better understand its role in the right whale conversation. The use of a Maine-only gear mark was unanimously supported by fishermen at all seven industry meetings as fishermen expressed strong support for identifying their gear from other trap/pot fisheries.

As stated in a letter to NOAA dated July 10th, ME DMR fully supports the improvement of gear marking to better inform conversations on right whale entanglements. As a result, the State intends to implement a Maine-only gear mark ahead of the federal regulatory process. ME DMR has already begun the State's regulatory process and, under the current timeline, the Maine-only gear mark could be required for Maine licensed lobster fishermen by spring 2020. Critical to this effort is guidance and confirmation from NOAA regarding the placement and color of the Maine-only mark. ME DMR highlights that it has not received a response to its July 10th letter to NOAA requesting written confirmation regarding the location and color of the Maine-only gear mark. This level of communication is needed to support Maine's efforts to enact regulations ahead of the federal process. For example, it is unclear if additional gear marking areas, such as Jeffery's Ledge and

Jordan Basin, will be maintained as states move to their own marks. ME DMR recommends that, as a part of the proposed rule, NOAA re-evaluates these markings against recent sightings data to determine the usefulness of area-specific marks in addition to state-specific marks.

D. Recommendations for the Proposed Rule-Making

As NOAA engages in the writing of a proposed rule, ME DMR requests the agency consider two topics which were not fully discussed or voted on at the ALWTRT meeting. A question repeatedly raised at the ME DMR industry meetings was the continued use of Maine's exemption line. As outlined in the 2007 Final Rule to the ALWTRP, the exemption line is based on the low number of right whale sightings in this area. NOAA has consistently defended the exemption line in previous rule-makings, commenting "NMFS does not believe that regulating the waters that will be exempted from the ALWTRP would have a significant benefit to large whales."[2]. Additionally, studies have shown there are low concentrations of calanus copepods shoreward of the 100 meter isobath, which do not support the aggregation of right whales.[3] As a result, NOAA did not include exempted waters as a part of the critical habitat designation for right whales. Instead, NOAA used the exemption line from the ALWTRP as the nearshore boundary, stating "late stage copepods in quantities sufficient to trigger right whale foraging are not present inshore of the Maine exemption line"[4]. Given no vote at the April ALWTRT meeting was taken in regards to the exemption line, ME DMR requests NOAA consider the impacts to industry versus the conservation benefits of establishing regulations within the exemption line. Taking extensive action in areas where right whales rarely, if ever, visit will not have a measurable impact on the right whale population.

In addition, ME DMR requests NOAA include a method for conservation equivalency within the proposed rule. As previously described, a key feature of the Maine lobster fishery is its diversity. This breadth of vessel size, fishing location, and crew precipitates the need for different management approaches within the State. Allowing for conservation equivalency in the rule-making provides an opportunity for fishermen to develop equivalent, or more conservative, regulations in their region to meet the requirements of the ALWTRP. This flexibility is needed to ensure not only the long-term success of the lobster fishery but also the protections provided to right whales.

[2] Taking of Marine Mammals Incidental to Commercial Fishing Operations; Atlantic Large Whale Take Reduction Plan Regulations, 72 Fed. Reg. 57103 (October 5, 2007).

[3] Runge 2012 Report "Summer distribution of the planktonic copepod, *Calanus finmarchicus*, along the coast of the Gulf of Maine"

[4] Endangered and Threatened Species; Critical Habitat for Endangered North Atlantic Right Whale, 81 Fed. Reg. 4837
(January 27, 2016).

E. Conclusions

ME DMR appreciates the opportunity to comment on the upcoming proposed rule regarding right whales and the Northeast trap/pot fishery. The Maine lobster fishery has been an active participant in the conservation of right whales for over twenty years. While ME DMR recognizes the scope of this comment period pertains to US entanglements in the trap/pot fishery, the Department highlights that this scope does not encompass the full set of impacts on the right whale population. Specifically, entanglement records indicate the full risk reduction outlined by NOAA should not be solely on the Northeast lobster fishery and the apportionment of risk to Canada should reflect the stark increase in right whale mortalities resulting from the snow crab fishery and Canadian vessel strikes. ME DMR underscores that placing further regulations on the Maine lobster fishery will not improve the status of the right whale population if mortalities are happening elsewhere.

We appreciate NOAA's consideration of these comments.

Sincerely,

Pat Keliher, Commissioner

3.3.1.5 Appendix V: ME DMR Vertical Line Research Initiative

Beginning in the summer of 2018, ME DMR received a grant from the Section 6 Species Recovery Grants to States program to assess the use of vertical lines throughout the Gulf of Maine region. Portions of the resulting data have been instrumental in the development of the ME DMR Plan to reduce the risk of entanglement for right whales in Maine fixed gear. Over the next year, as new draft and final rules for the Atlantic Large Whale Take Reduction Plan are proposed and finalized, ME DMR will use the following data as a basis for the development of weak point options in the fishery. This work will be done in collaboration with the fishermen and other relevant industry stakeholders. The primary objectives of this work will be to:

1) Collaboratively develop and test gear modifications that break at or below 1700lbs and can be integrated into existing gear to minimize the impact on the fishery
2) Work with NMFS to include these options on a list of approved modifications that will meet a weak point regulation
3) Field test a variety of modifications with the fishing industry, including manufactured weak points that could go through the hauler

Volunteer Gear Survey

In the summer of 2018, ME DMR sent out a gear survey to fishermen throughout the Northeast region to assess their use of vertical lines and received over 800 responses through online, paper, and phone- based options. One of the pieces of information from that survey that has been used in the development of this proposal is the variety of rope diameters used in different segments of the fishery, including by distance from shore. While there is a spread of diameters used in Maine, survey responses show the most prevalent diameter of rope used in the lobster fishery is 3/8", followed by 7/16" (Figure 1). The data also show the relative use of diameters of line greater than 3/8" increase with distance from shore (Figure 2).

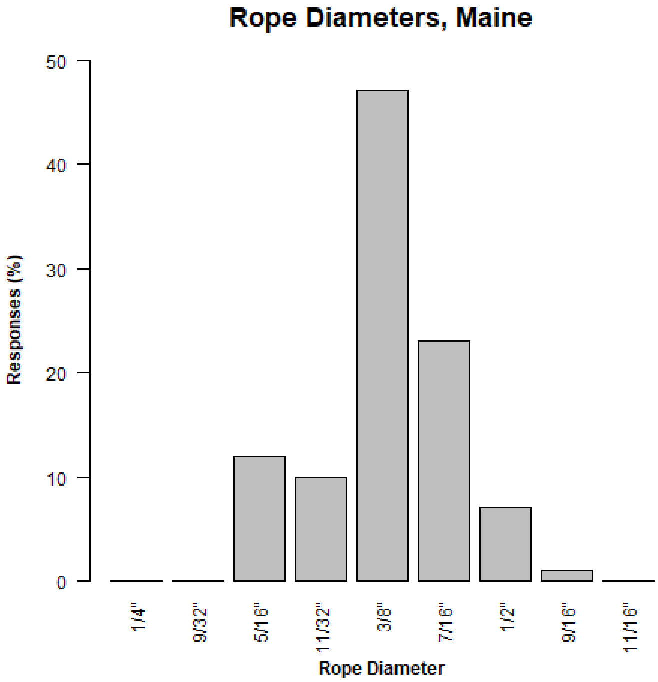

Figure 1. *Percentages of Maine based responses from the volunteer gear survey that use different diameters of line. Respondents could choose more than one diameter if their line contains multiple diameters or if their rope use differed by area. The most prevalent gear in the Maine lobster fishery is 3/8" rope being reported by 47% of respondents.*

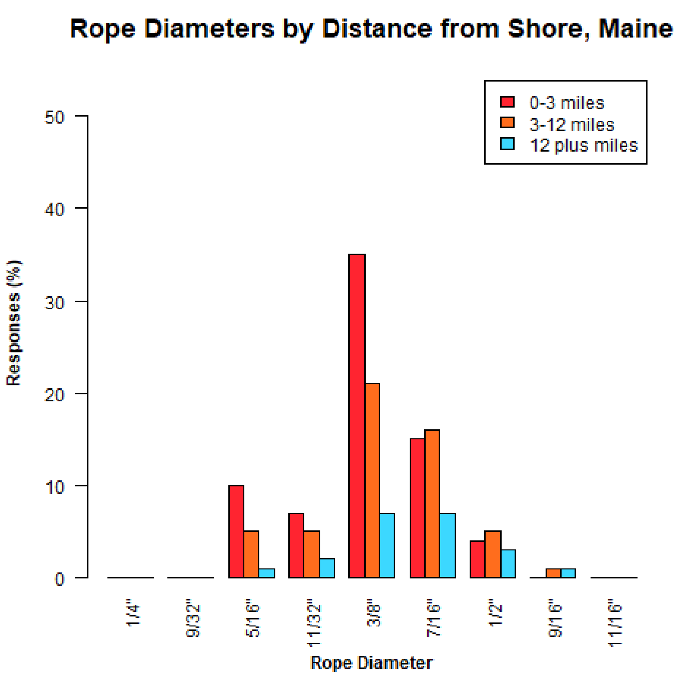

Figure 2. *Rope diameter use by distance from shore from the Maine responses to the volunteer gear survey. The proportion of ropes greater than 3/8" increases as gear moves offshore.*

Functional Breaking Strength

The second effort of this project included collecting donated vertical lines from fishermen throughout the region. The goal was to break a variety of ropes and capture the spectrum of functional breaking strengths for vertical line configurations used in the fishery. These data could be used to determine what configurations of vertical lines in the fishery are already weak, or break at or below 1700lbs, as well as provide a way to determine the benefit gained by requiring weak points in the vertical lines.

Whole vertical lines were collected from fishermen in addition to information about where the line was fished, rope types, rope diameters, age of rope, gear configuration, etc. A total of 215 samples were broken on the Tinius Olsen tensile testing machine housed at the DMR lab in Boothbay Harbor. These samples included the knots and splices that were used to tie ropes together to make up the vertical lines, as well as clear or unmodified pieces of rope. The ages of the rope generally ranged from two to six seasons fished, but went up to as many as twelve seasons (Figure 3). Figure 4 shows the results of the breaking strength tests. The sample sizes generally represent the relative occurrence of a certain diameter in the fishery. Knots and splices reduce the breaking strength of rope, which is of importance since less than 5% of lines fished in the fishery are used without a modifying link of some kind (Figure 5). When a line of two different diameters knotted or spliced together was tested, the smaller diameter broke 100% of the time and the knot or splice always stayed with the larger end if it did not unravel.

These results show that, of all of the diameters tested, 5/16” can be considered to meet the threshold of breaking at 1700lbs, especially with the addition of a knot. While many of the larger diameter ropes did break below 1700lbs with some regularity, the type of knot or splice used would have to be identified to be able to add these diameters to a list of weak points which break at or below 1700lbs. Results of a two-way ANOVA suggest that rope diameter, modifications to the rope (splices and knots), and age or seasons fished all have a significant effect on the breaking strength of the vertical line (Table 1). It should be noted that the relationship between the diameter of rope and the breaking strength is regardless of material used since all types of ropes that are used in the lobster fishery are represented in the dataset (Figure 6).

Table 1. *Results of two-way ANOVA showing the significant relationship between breaking strength of line and rope diameter, modifications, and age.*
Rope Breaking Strength ~ Rope Diameter + Rope Modifications + Seasons Fished

	f-value	p-value
Rope Diameter	13.8	<0.0001
Rope Modifications	29.3	<0.0001
Seasons Fished	11.9	<0.0001

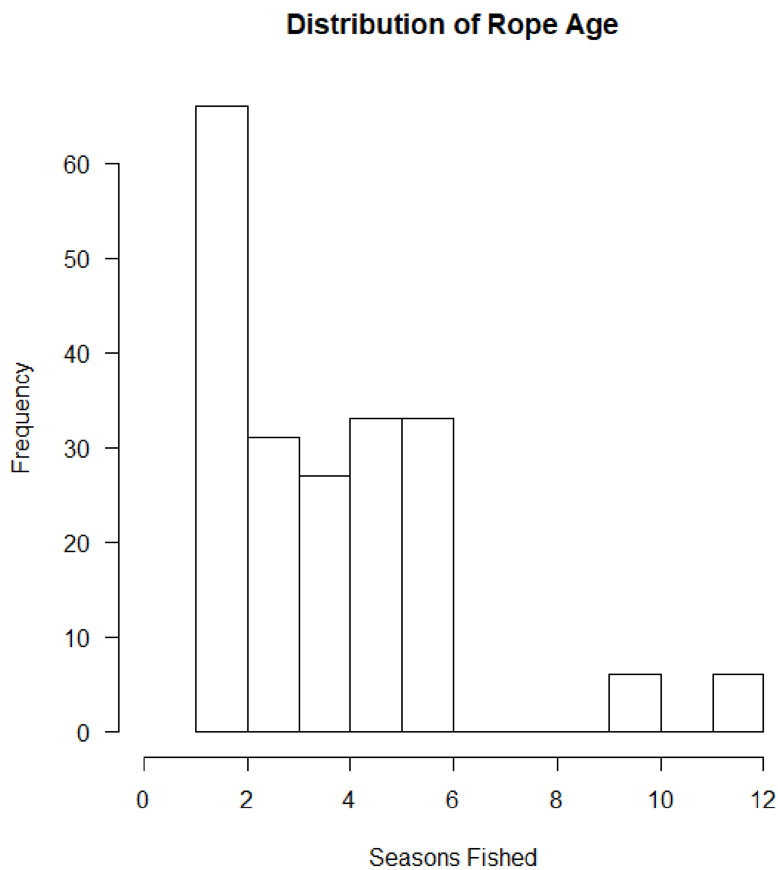

Figure 3. *The distribution of the ages of vertical lines that were donated for breaking strength testing. While some went up to as many as 12 seasons fished, the majority of donated lines had been fished between two and six seasons.*

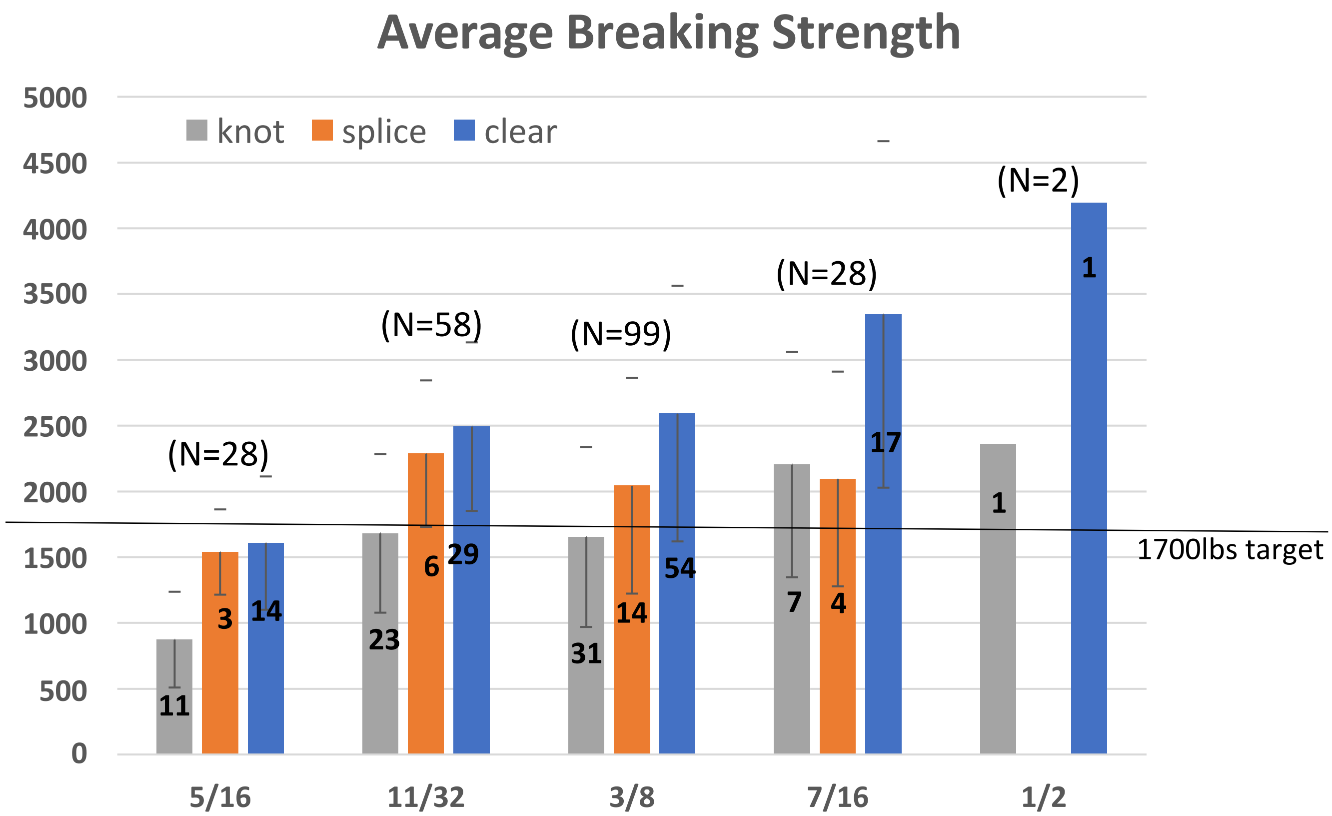

Figure 4. *The breaking strength in pounds for over 200 samples of vertical lines donated by lobstermen in the Northeast region for ropes 5/16" to ½". The varying sample sizes for each diameter and sample type are denoted in the figure. Sample breaks included the knots (grey) or splices (orange). Unaltered (no knots or splices) lengths of lines were also broken to show how much a knot or splice reduces the breaking strength. Those breaks are labeled as "clear" in blue.*

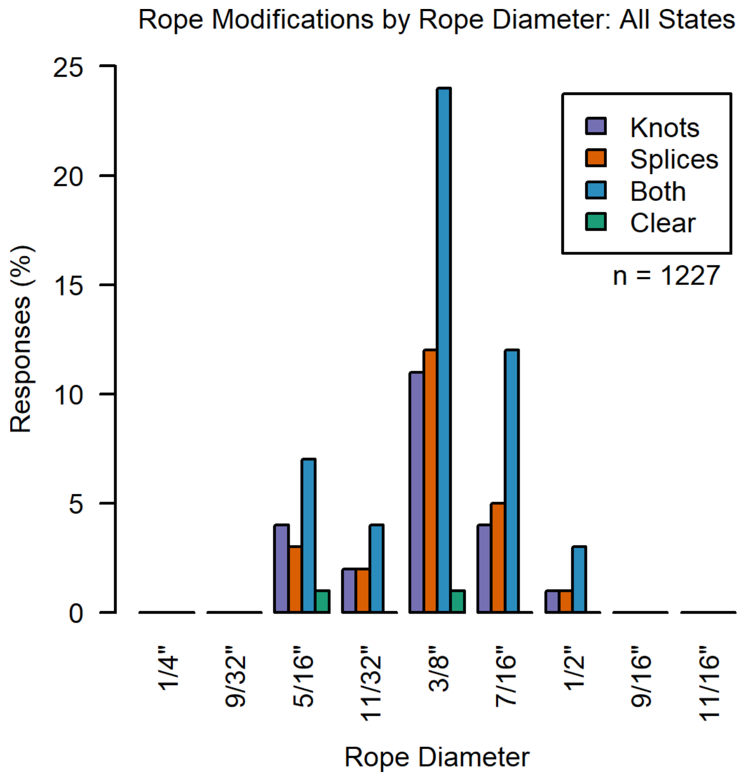

Figure 5. *The percentage of respondents to the gear survey that utilize knots, splices, or both knots and splices by rope diameters. Less than 5% of respondents do not modify vertical lines ("clear").*

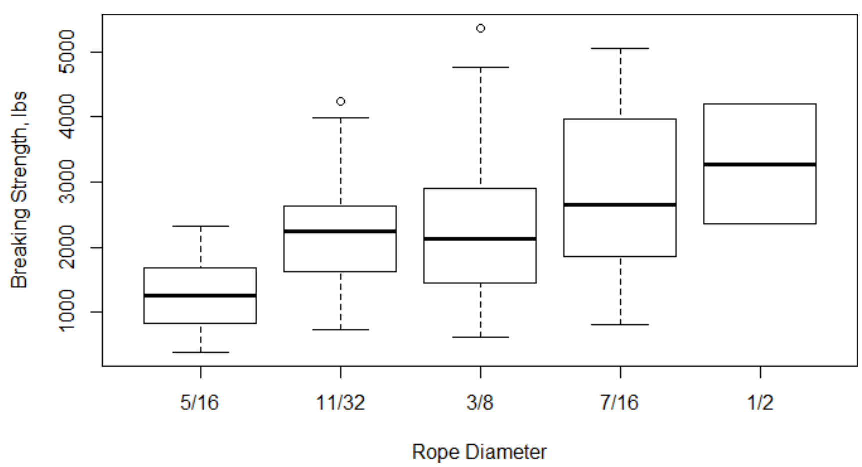

Figure 6. One-way ANOVA suggests a significant linear relationship between the rope diameter and the breaking strength of the line (F=11.512; Pr(>F) = 1.811e-08 ***)

Initial Weak Point Workshop

ME DMR held an initial industry workshop to test various configurations of vertical line attachment points that might meet the requirements of an approved weak point. Several fishermen were in attendance and came with ideas they wanted to test for weak points. Table 2 summarizes the more than twenty options that were initially tested. Of those options, a subset that showed promise of breaking below 1700lbs were chosen for further testing. Ten samples of each of those options were rigged up by fishermen and sent back to ME DMR for breaking strength testing. The results of those samples are summarized in Table 3 and are the basis for what has been discussed with the industry to-date. Potential options that will move on to the field-testing phase include lengths of 5/16" line knotted or spliced into the vertical line, 3/8" rope connected with a loop and double tuck ("lazy splice"), and manufactured products like dog bones (Figure 7).

Some of the options tested during the workshop included a couple of different brands of dog bones, as well as some modified dog bones (Figure 7). Dog bones were included because some fishermen in attendance were interested in investigating a manufactured weak point option that integrated easily into the line and was already being used in the fishery. The benefit of a manufactured point, as opposed to utilizing certain knots or splices in the line, is that the point will not degrade in strength over time. A rope made to break 1700lbs over its entire length or of a small diameter, like 5/16", will decrease in strength with the use of knots or splices and will lose strength over time. While strength over the age of the rope varies based on diameter, rope material, storage, and UV exposure, there is a significant decline in strength versus the number of seasons fished for a vertical line (Figure 8).

Table 2. *Ideas brought forward by fishermen and initially tested for breaking strength. Highlighted ideas were carried through to have additional samples tested or will be field tested with fishermen in the future. This list is not meant to be exhaustive but it what has been tested so far.*

Break	Diameter	Rope Modification	Breaking Strength (lbs)
1	3/8 danline	lazy man splice one pleat	no break, stretched until 1950
2	3/8 manline	sqaure "splice"	2435
3	3/8 manline	sqaure "splice"	2300
4	**3/8 manline**	**lazy man splice two tuck**	**1650**
5	**11/32 sink to 3/8 float**	**lazy man splice two tuck**	**1396**
6	3/8 float 11/32 sink	short splice	2326
7	11/32 sink 7/16 float	lazy man splice two tuck	2050 slipped off wheel
8	**5/16 sink 3/8 float**	**lazy man splice two tuck**	**1257**
9	11/32 sink 7/16 float	lazy man splice one tuck each side taped	slide out of tape at 700
10	5/16 sink 3/8 float	white dog bone and knot	2300
11	5/16 sink 7/16 float	lazy man splice 2 tuck	1378 no break pulled through
12	**3/8 loat 7/16 float**	**black dog bone**	**1550**
13	**5/16 sink 3/8 float**	**short splice**	**1800**
14	5/16 sink	clear	
15	**3/8**	**notched dog bone**	**1468**

Break	Diameter	Rope Modification	Breaking Strength (lbs)
16	11/32 sink 3/8 float	short splice	2454
17	**3/8**	**modified white dog bone, drilled on the top**	**1656**
18	11/32 sink 7/16 float	short splice	2202
19	**3/8**	**lazy man splice two tucks**	**1209**
20		steel swivel	2500+

Table 3. *Trials of options from the initial weak point workshop. *denotes trials where the tuck slipped out instead of breaking the line. Some dog bones were testing higher than 1700lbs and, therefore, were modified with drilled holes to reduce the strength prior to completion of the tests.*

Description	trial 1	trial 2	trial 3	trial 4	trial 5	trial 6	trial 7	trial 8	trial 9	trial 10	average
7/16 white dog bone to 3/8	1470	1748	1892	1674	1835	1722	1870	1854			1758.13
3/8 white dof bone to 3/8	1121	1922	1442	1415	1742	1776	2016	1869	1798	1826	1692.70
7/16 lazy splice to 3/8	2123	2215	2101	2199	2204	2119	1715	2168	2103	2067	2101.40
3/8 lazy splice to 3/8	483*	1845	728*	1301	1365	1761	1159	1246	1654		1475.86
3/8 blackdog bone to 3/8 no hole	2423	2313	2476								2404.00
3/8 black dog bone to 3/8 3.5mm hole	1866	1876	2328								2023.33
7/16 black dog bone to 3/8 3.5mm hole	2153	1814	2105	2312	2414	1919	2497	2023	1938	2014	2118.90

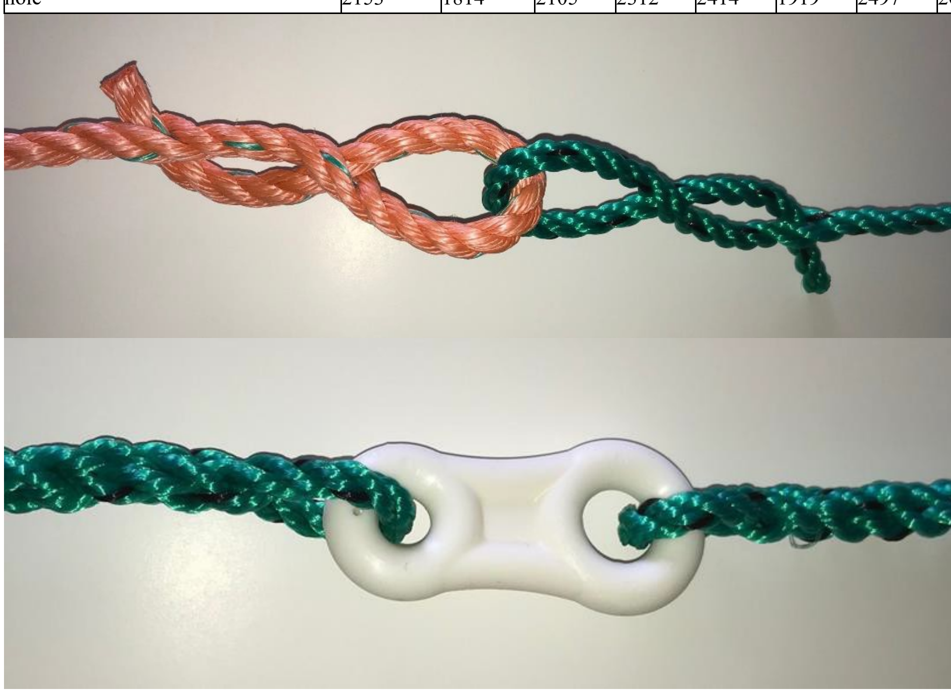

Figure 7. *Examples of options testing for weak points. The top option is a photo of the loop and double tuck (7/16" into 3/8") or "lazy splice". The bottom is an example of a dog bone. Several different types of dog bones were broken and/or modified and broken during the tests.*

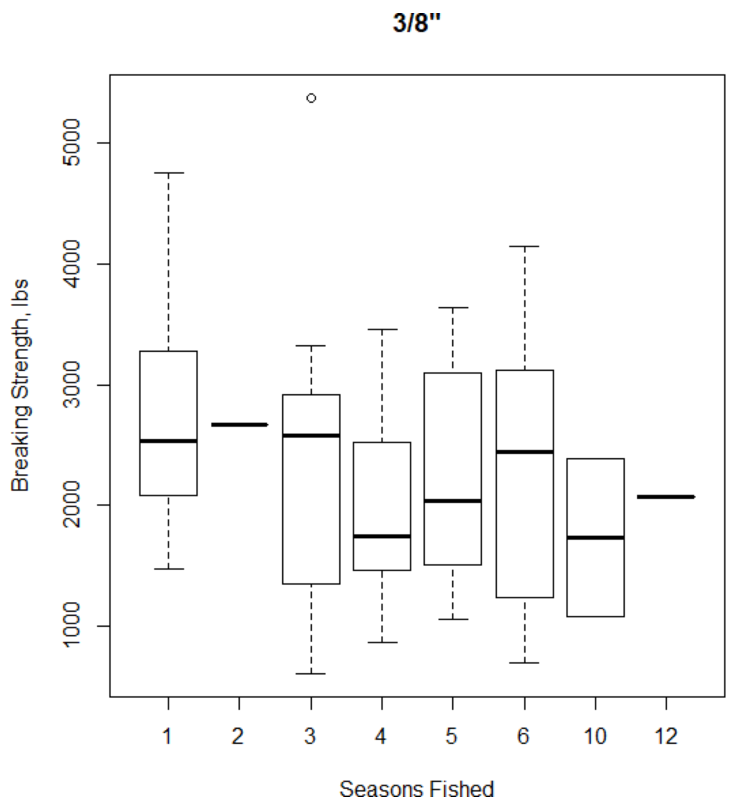

Figure 8. *Using 3/8" rope only (the most common rope diameter), this plot shows the relationship between rope breaking strength and seasons fished or age. All different types of rope and manufacturers are included in this analysis and accounts for some of the variability in the results.*

Future Work

ME DMR is continuing to work with the fishing industry and other stakeholders in the ALWTRT process to find options for weak points in vertical lines. The next steps in this work will include field testing some of these ideas with fishermen and conducting load cell testing integrated into their vertical lines. ME DMR has already begun soliciting ideas from fishermen for ways to rig weak points into their existing gear and will work with them to test those ideas on the Tinius Olsen Tensil testing machine in Boothbay Harbor. ME DMR is also pursuing funding to work with the manufacturers of products liked dog bones and engineers to create new manufactured weak points (similar to existing weak links) that will run through the hauler when integrated into the vertical line. ME DMR is committed to working with NMFS throughout this process to develop options that will work for all stakeholders.

3.3.2 MA DMF Proposal

Commonwealth of Massachusetts

Division of Marine Fisheries

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Daniel J. McKiernan
Acting Director

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Kathleen Theoharides
Secretary
Ronald Amidon
Commissioner
Mary-Lee King
Deputy Commissioner

March 6, 2020

Michael Pentony, Regional Administrator NOAA Fisheries, GARFO
55 Great Republic Drive Gloucester, MA 01930

RE: Massachusetts Right Whale Conservation Plan 2020

Dear Mr. Pentony,

The Massachusetts Division of Marine Fisheries offers the following proposal to amend the Atlantic Large Whale Take Reduction Plan and provide protection for right whales in Massachusetts coastal waters (see attachment titled Massachusetts Right Whale Conservation Plan 2020). The Division has been a committed member of the TRT since its inception. We are committed to developing a comprehensive strategy to reduce the risk of entanglement and serious injury and mortality to North Atlantic right whales that maintains a safe, efficient, and profitable lobster fishery in Massachusetts.

Sincerely,

Daniel J. McKiernan

Daniel J McKiernan

ATTACHMENT A
2020 Massachusetts Right Whale Conservation Plan

Background

Over the last several months, the Massachusetts Division of Marine Fisheries (DMF) has worked closely with the National Marine Fisheries Service and the Massachusetts lobster industry to develop conservation measures to augment protections for right whales under the Atlantic Large Whale Take Reduction Plan. We understand the challenge in identifying conservation measures that meet the 60% risk reduction target but are still workable for the fishing industry. Given the current trajectory of the right whale population and the high abundance of whales observed in Massachusetts waters each year, we are committed to achieving an overall goal of 60% risk reduction in our waters.

However, meeting that goal is especially complicated in Massachusetts because we are the only state with multiple lobster management areas (LMA) in our waters. Each area has their own unique lobster management strategy, level of fishing effort, and trends in effort. In addition, each area has varying patterns of whale distribution and abundance.

In our deliberations about conservation measures, we considered three categories; measures that address acute entanglement risk, measures that address dispersed entanglement risk, and measures that mitigate for serious injury and mortality (SIM) and sub-lethal effects. Acute entanglement risk is that posed to a dense, consistent, and largely predictable aggregation of whales. Whereas dispersed entanglement risk is that posed to single whales or small groups of whales whose movements are unpredictable and observed distribution occurs infrequently. Mitigating the risk of SIM and sub-lethal effects is focused on reducing harmful impacts to whales in the event that an entanglement occurs.

Acute Entanglement Risk

We feel that the appropriate management tool to address acute entanglement risk at this time is the elimination of risk through a seasonal closure to fixed fishing gear. Approximately 65% of the known right whale population visits Cape Cod Bay each year. This is the largest known aggregation of North Atlantic Right whales in the world. In a single day in April 2017, a total of 179 right whales were observed in Cape Cod Bay. This represents a peak observed density of 10 right whales/cubic mile of water. To put this in perspective, the Gulf of St. Lawrence, an area which hosts large aggregations of right whales in recent years and has been the epicenter of an Unusual Mortality Event since 2017, has only ever reached a known peak density of 0.012 whales per cubic mile of water, in June 2018. This underscores the importance of the Massachusetts Bay Restricted Area (MBRA) as an effective means of eliminating entanglement risk and subsequent serious injury and mortality to right whales. The MBRA closure likely represents the single most important conservation measure to right whales in the United States. The Division of Marine Fisheries (DMF) has been proactive in ensuring the effectiveness of the state waters portion of the MBRA closure. We have done this by implementing a dynamic extension of the fixed gear closure in the state waters portions of the Mass Bay Restricted Area if the presence of right whales extends past the closure end date. The size, location and duration of the closure extensions are created by DMF through the director's authority using data on whale distribution and abundance from the Provincetown Center for Coastal Studies (PCCS) aerial surveillance team. Furthermore, with help from the Massachusetts Environmental Police we regularly patrol Cape Cod Bay to identify and remove any derelict or abandoned fishing gear to further reduce the risk of entanglement.

Ropeless fishing represents another possible means to mitigate acute entanglement risk. It is our belief that the technology and concomitant fisheries management framework necessary to execute ropeless fishing is not sufficiently developed at this time to allow it in a manner that is safe, cost effective, compatible with high gear densities, and compatible with important competing mobile gear fisheries for groundfish, sea scallops, and surf clams. DMF is committed to permitting and promoting experimental ropeless fishing in areas and times that do not have a high risk of conflict with other fisheries and do not pose substantial risk of interactions with right whales.

Dispersed Entanglement Risk

Dispersed entanglement risk is a more general risk posed by gear in times and places where whales are not aggregated. The primary way of mitigating this risk is reducing the amount of buoy lines deployed in all fixed gear fisheries. It is our opinion that to effectively reduce buoy lines it is first necessary to establish an accurate baseline of how many buoy lines are being fished. DMF has required all fixed gear fishermen who land in MA ports to report the number of buoy lines they deploy since 2011. This includes federally permitted fishermen as well. We are one of only two jurisdictions in the U.S. that currently requires this. With these data we can look at trends over time and can judge the effectiveness of management measures we have put into place to control fishing effort with empirical data. We do not have to rely solely on models, assumptions, and expert opinion to quantify buoy line numbers. Since 2011 we have observed declining trends in the number of buoy lines deployed in the lobster fishery by Massachusetts based fishermen (Table 1, Figures 1 – 4). This trend is apparent both statewide and in each individual lobster management area (LMA) within Massachusetts coastal waters. Buoy line trends from Massachusetts based LMA3 fishermen have increased in recent years, but the entirety of LMA3 falls outside or our jurisdiction.

Table 1: MA Lobster-pot Fishery, Total maximum buoy lines by LMA and Year, 2011-2018

LMA	2011	20122013	2014	2015	2016	2017	2018
LMA1	71,811	67,80165,220	66,050	61,014	64,191	67,846	60,821
LMA2	10,952	10,8288,560	7,803	7,333	7,167	7,002	6,188
LMA3	1,299	1,2561,335	1,549	1,040	1,126	1,228	1,656
OCLMA	18,430	15,02716,773	15,009	15,037	13,669	13,518	13,474
Total	102,492	94,91291,888	90,411	84,424	86,153	89,594	82,139

Data Source: MA Supplemental Reports and LMA permit declaration

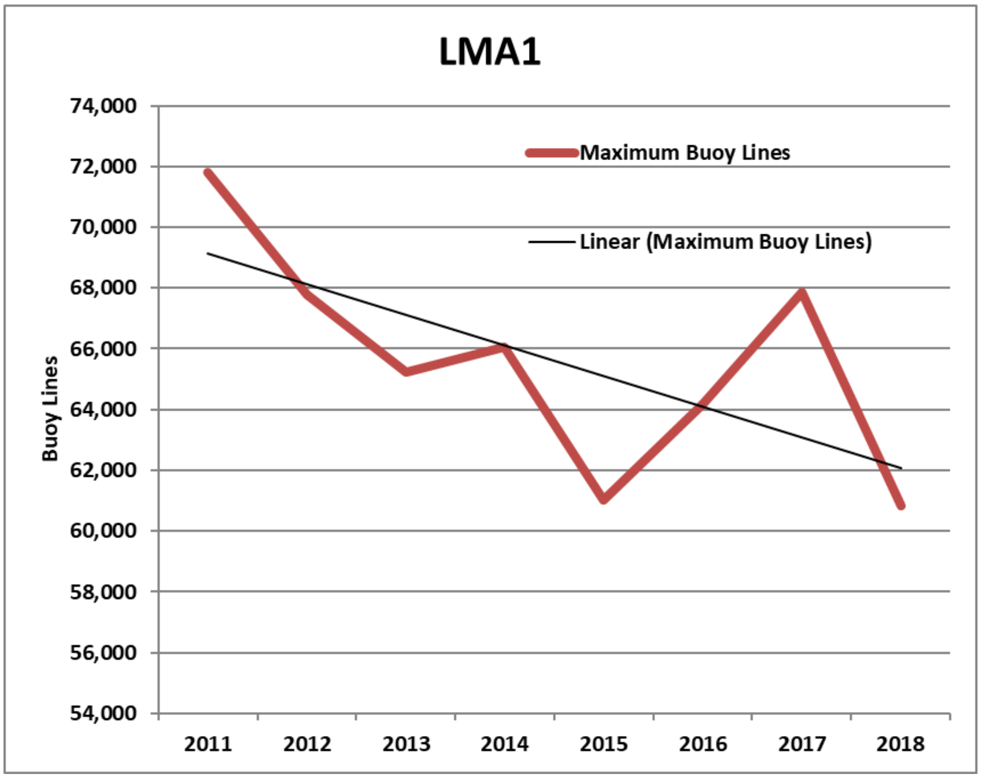


Figure 1. Total maximum buoy lines deployed in LMA 1 – 2011 - 2018

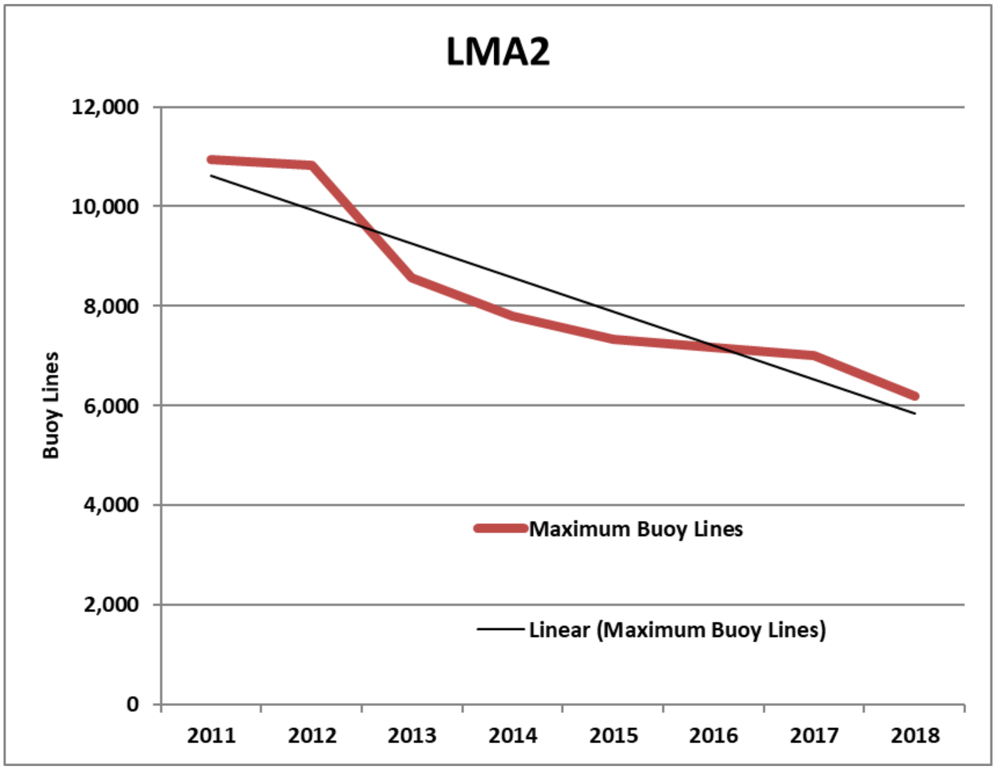


Figure 2. Total maximum buoy lines deployed in LMA 2 – 2011 - 2018

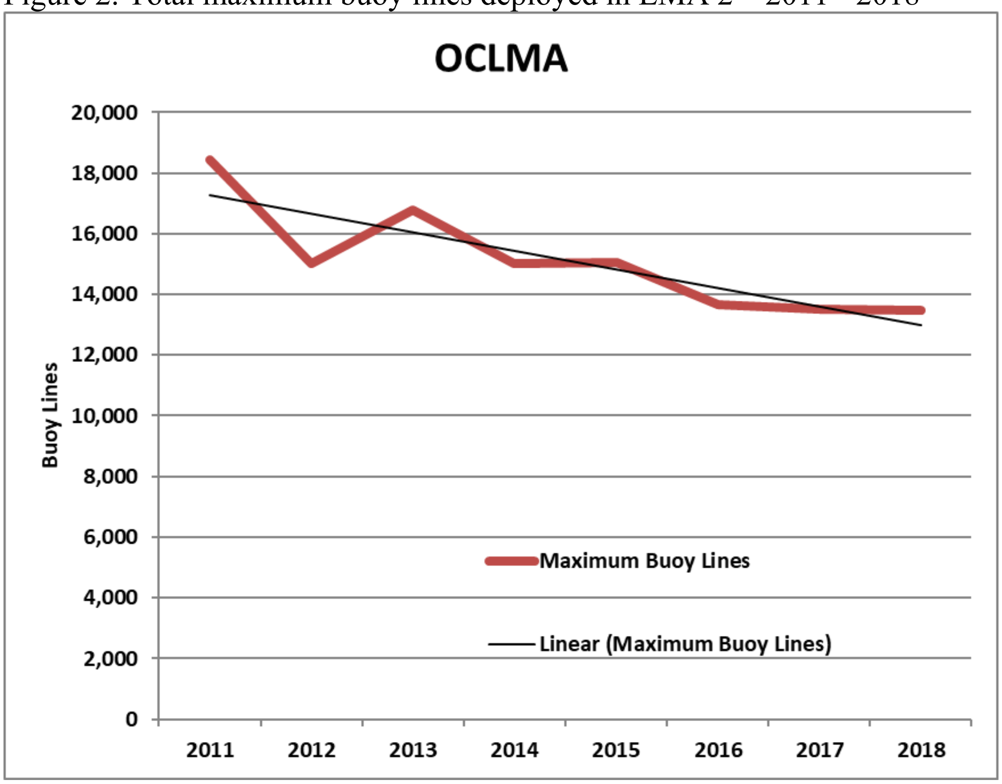


Figure 3. Total maximum buoy lines deployed in LMA OCC – 2011 - 2018

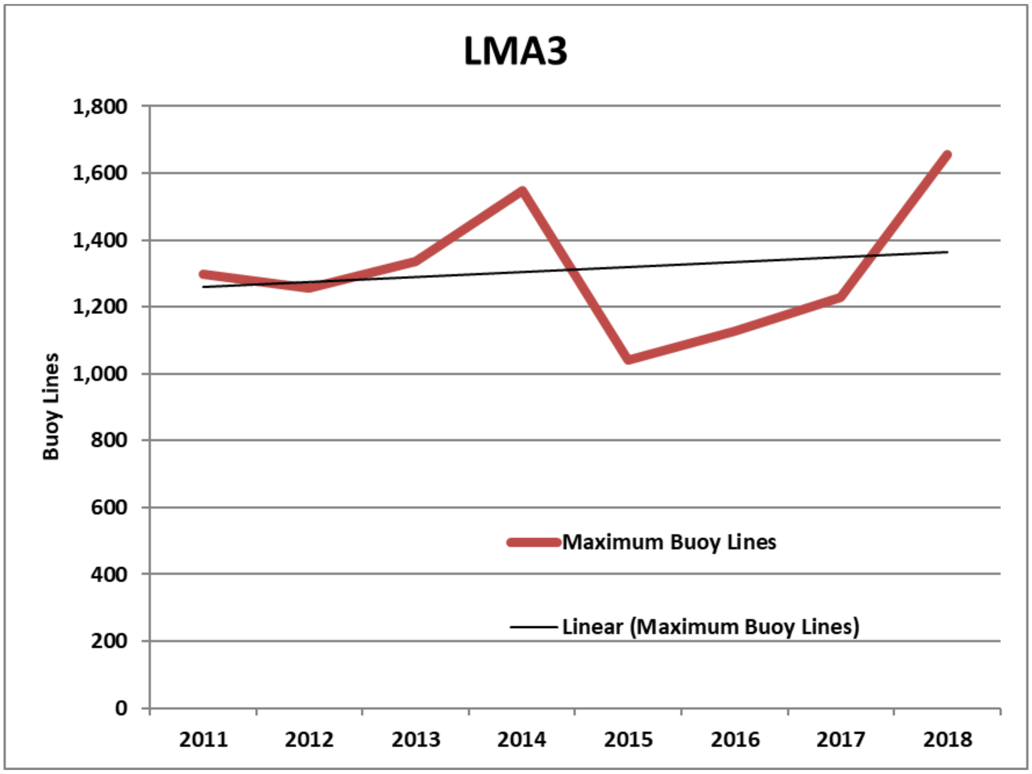


Figure 4. Total maximum buoy lines deployed in LMA 3 – 2011 – 2018

Over the long term we have proactively managed lobster fishing effort in the Massachusetts lobster fishery. We have had a moratorium on the issuance of new coastal lobster fishing permits since 1988 and a moratorium on the issuance of LMA 1 lobster landing permits since 2003. We allow the transfer of active coastal lobster permits (at least 1,000 lbs or 20 sales per year for 4 out of last 5 years) to qualified individuals (1-year full time or equivalent part-time experience in the lobster trap fishery or 2-years full-time or equivalent part-time experience in other commercial fisheries). This has resulted in a long-term reduction in the number of participants and the amount of fishing effort in the MA lobster fishery (Table 2 and 3).

Table 2: MA Lobster-pot Fishery, Active Permit Count by LMA and Year, 2011-2018

LMA	2011	2012	2013	2014	2015	20162017	2018*
LMA1	669	650	628	624	627	627634	651
LMA2	77	78	73	64	71	7873	71
LMA3	21	26	25	28	25	2626	27
OCLMA	69	67	71	67	65	6160	63
Total	836	821	797	783	788	792793	812

Data Source: MA Trip-level reports and NOAA Fisheries VTRs
*Preliminary, subject to change

Table 3: MA Lobster-pot Fishery, Issued Permit Count by Permit type and Year, 2011-2018

Issued Permits	2011	2012	2013	2014	2015	2016	2017	2018
Coastal Lobster	1,245	1,214	1,188	1,170	1,139	1,116	1,088	1,081
Offshore Lobster	189	175	161	163	159	154	171	156
Seasonal Lobster	98	78	79	76	86	88	96	100
Total	1,532	1,467	1,428	1,409	1,384	1,358	1,355	1,337

Data Source: MA Permitting database

All Massachusetts fishermen who fish in LMA1, LMA2, and LMAOCC have been subject to a maximum trap limit of 800 since 1992. In addition to this LMAOCC and LMA2 have been subjected to a historically based trap allocation plan in 2004 and 2007 respectively. These plans allocated individual transferable trap allocations based on historical participation and also include a 10% trap tax on any partial trap allocation transfer. NMFS has adopted complimentary measures to these plans and your agency is integral to the administration of these plans. The implementation of the effort capping and effort reduction measures in Massachusetts have greatly contributed to the reduction in traps and the reduction of buoy lines we have observed. We anticipate that the declining trends in participation, traps, and buoy lines will continue to decline. The median age of fishermen in Massachusetts has steadily increased over time and is rapidly approaching the age at which many fishermen retire or downscale their effort (Figure 5).

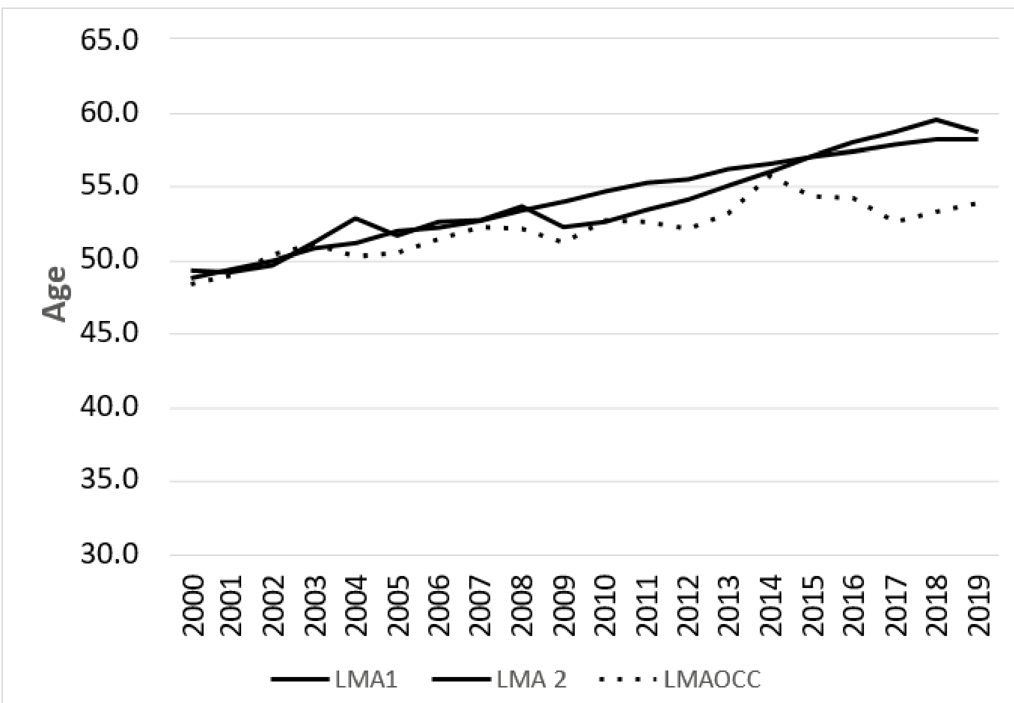


Figure 5. Median age of lobster permit holder in LMA1, LMA2, and LMAOCC – 2000 to 2019.

As these fishermen reach retirement and leave the fishery, we expect that only a portion of their permits will be transferred. In LMA2 and LMAOCC this has and will continue to promote partial trap allocation transfers which are subject to a 10% trap tax. DMF will continue to monitor participation and efforts trends over time and is committed to making necessary adjustments to our management framework to ensure long term stability in participation in our lobster fishery with continued reductions in buoy lines. We believe our track record in this area speaks for itself.

Mitigating for Serious Injury and Mortality and Sub-Lethal Effects

The vast majority of buoy lines fished in Massachusetts state waters are comprised of either 5/16” or 3/8” line. Prior to 2010, these smaller diameter lines were also the most common size removed from entangled right whales. However, in recent years, the majority of rope removed from and seen on right whales has been heavy, large diameter rope not used in the inshore US lobster fishery. This gear is typical of the offshore lobster fishery and the Canadian snow crab fishery. This heavy line also has a higher breaking strength and is most likely to cause severe entanglement injuries and mortality. An analysis of entanglement cases found only severe injuries resulting from higher breaking strength line (Knowlton et al. 2016). That same analysis concluded that the broadscale use of reduced breaking strength ropes (1,700 pounds or less) would reduce the number of life-threatening whale injuries by 72%. Some scientists also believe that sub-lethal effects of minor entanglements are putting additional stress on the already declining right whale population and further suppressing their ability to recover. To address disperse entanglement risk during times when whales are not aggregating, Massachusetts managers and fishermen have been pursuing potential weak rope options for vertical lines. DMF and the Massachusetts Lobstermen’s Association are partnering on a state-wide effort to test weak rope options beginning in summer 2020. In addition, the South Shore Lobstermen’s Association has successfully developed a weak sleeve that can be used on traditional buoy lines to create 1,700-pound weak links. Massachusetts is committed finding effective weak rope solutions to make vertical lines less harmful to right whales while sufficiently safe for the commercial fishermen.

The Division of Marine Fisheries proposes the following management strategies:

Acute Entanglement Risk

*Continue the ongoing MBRA seasonal fixed gear closure from February 1st through April 30th.
*Dynamic closure extension of the state waters portion of the MBRA using state authority to extend the closure in portions of state waters, as necessary based on up to date whale surveillance.
*Establishment of a new South of Nantucket Restricted Area (SNRA) fixed gear closure from February 1st through April 30th (Figure 6a and 6b). We propose using utilizing 2017 to 2019 right whale sightings data to evaluate this closure. We also suggest that the size, shape, and timing of this closure be re-evaluated ever three years and modified as necessary.

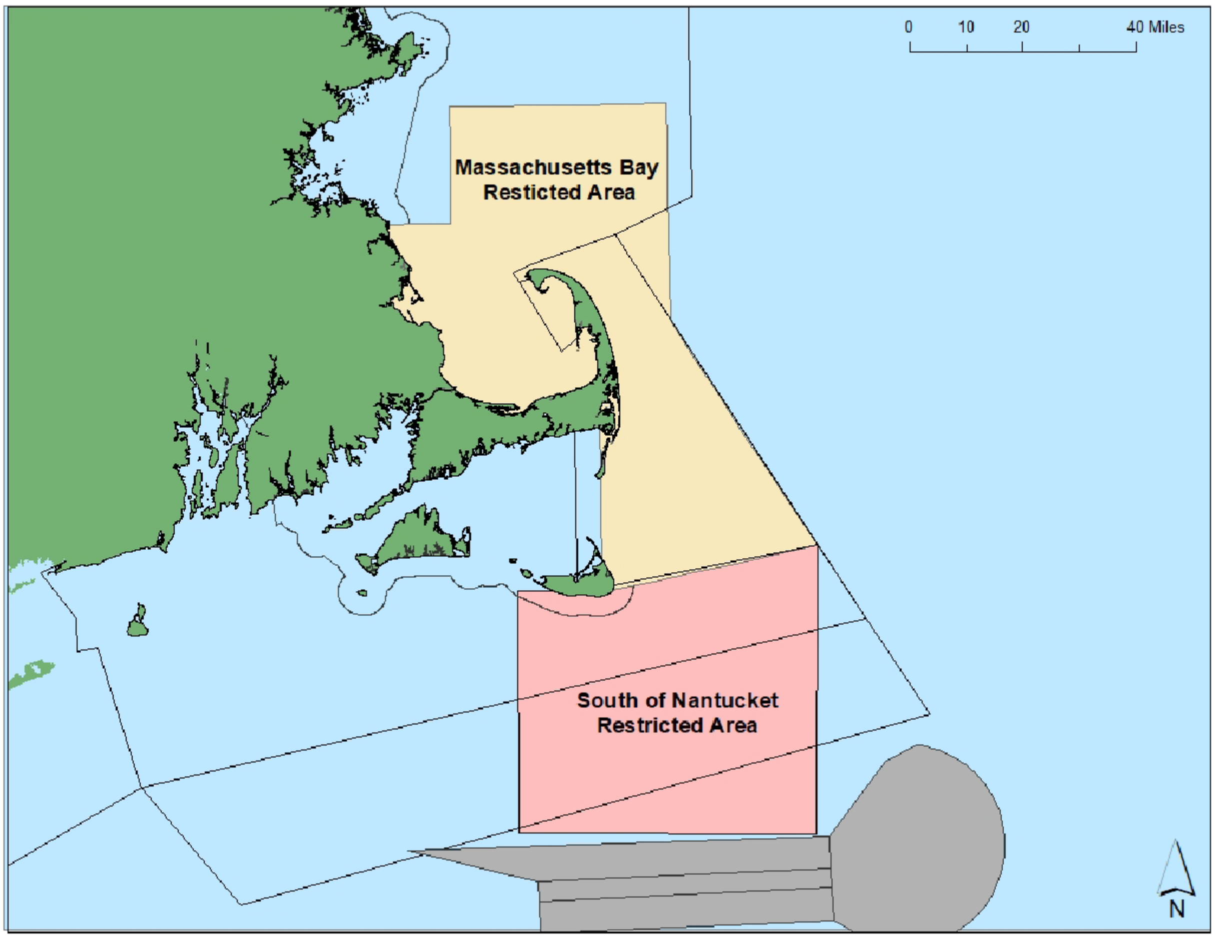


Figure 6a. Map of the Massachusetts Bay Restricted Area and newly proposed South of Nantucket Restricted Area.

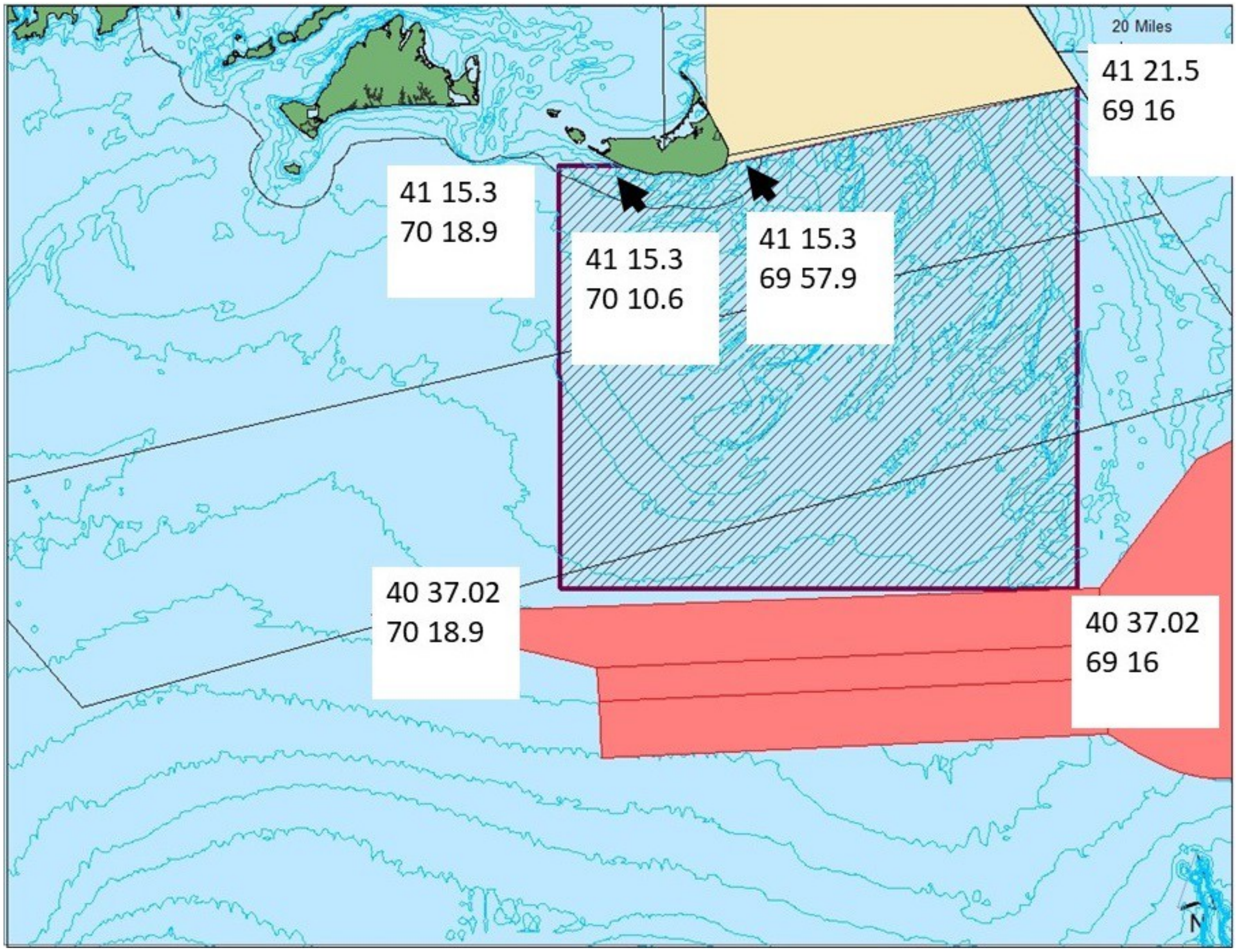


Figure 6b. Close up map of the proposed South of Nantucket Restricted Area with coordinates of each corner.

<u>Dispersed Entanglement Risk</u>

1.) Trawling up requirements – We expect these to be applied to all fishermen in the EEZ regardless of state of origin.

i. LMA 1

1. 3 to 6 miles - 10 trap per trawl minimum

2. 6 to 12 miles - 15 trap per trawl minimum

3. 12 + miles – 25 traps per trawl

ii. LMA 2

1. 3 to 12 miles – 15 trap per trawl minimum

2. 12 + miles – 25 traps per trawl

iii. LMA OCC

1. 3 miles to LMA 3 boundary – 15 trap per trawl minimum

2.) Ban on fishing singles on vessels greater than 29' in all MA LMA's on permits transferred after 1/1/2020

3.) Continue the ongoing 50% trap allocation reduction in LMA2 through 2021

i. 2016 – 25% reduction
ii. 2017 – 5% reduction
iii. 2018 - 5% reduction
iv. 2019 – 5% reduction
v. 2020 - 5% reduction
vi. 2021 - 5% reduction

Mitigation of SIM and Sub-lethal Effects

1.) Requirement for all fishermen in all LMA's to utilize 1,700 lb. breaking strength rope or an approved 1,700 lb. contrivance as follows;

i. Coast to 3 miles – One weak contrivance at 50% down buoy line.
ii. 3 miles to 12 miles – Two weak contrivances in topper at 25% at 50% down.
iii. 12 miles to the LMA 3 border – One weak contrivance in topper at 35% down.
iv. Ban on all rope greater than 3/8" diameter in Massachusetts coastal waters.

Summary

Based on preliminary evaluations and discussions with NMFS staff we are confident that the measures we have proposed will achieve the required 60% risk reduction for the Massachusetts lobster fishery. We encourage NMFS to utilize a combination of the risk evaluation tool, empirical data, expert opinion, and common sense when evaluating our proposal. We also urge NMFS to utilize more recent right whale sightings data instead of relying solely on a long time series. To date the risk evaluation tool has relied on right whale sightings data from 2010 through 2017. Time series of sightings data make sense for demonstrating historic usage of habitat, however in a rapidly changing environment with documented broadscale changes in right whale distribution, they likely do not accurately reflect current density and distribution of whales. This has the potential to overestimate the effectiveness of risk reduction measures in some areas and underestimate it in others.
In closing, we are committed to developing a comprehensive strategy to reduce the risk of entanglement and serious injury and mortality to North Atlantic right whales that maintains a safe, efficient, and profitable lobster fishery in Massachusetts.

Attachment 2 emailed on March 12, 2020 MA Vessel size state data all states:

2018										
COUNT OF PERMITS		AVERAGE TRAPS/TRAWL BIN								
LMA	VESSEL LENGTH	1	2	3-4	5-9	10-14	15-19	20+	NO SUPP REPORT	GRAND TOTAL
LMA1	0-20'	40	5	8	3					56
	20-25'	36	1	12	26	15				90
	25-30'	8	1	2	23	20	6			60
	30-35'	5	1		36	82	21	12		157
	35-40'	3	1		8	54	29	49		144
	40-45'	2		1	1	11	26	62		103
	45-50'						3	11		14
	50'+							1		1
	NO SUPP REPORT								23	23
LMA1 TOTAL		94	9	23	97	182	85	135	23	648
LMA2	0-20'	4			1					5
	20-25'	6			1					7
	25-30'	3		1	1	1				6
	30-35'	4		1	5	7	2			19
	35-40'	1			1	6	5	3		16
	40-45'		1				3	1		5
	45-50'				1		2	5	5	13
	NO SUPP REPORT									0
LMA2 TOTAL		18	1	2	10	14	12	9	5	71
LMA3	45-50'							1		1
	50'+						1	21		22
	NO SUPP REPORT								4	4
LMA3 TOTAL		0	0	0	0	0	1	22	4	27
OCLMA	0-20'	3								3
	20-25'	3				1	1			5
	25-30'	6				1				7
	30-35'	13	1		4	2	1	1		22
	35-40'	7		1		1	4	3		16
	40-45'	1				1	1	5		8
	45-50'						1			1
	NO SUPP REPORT								1	1
OCLMA TOTAL		33	1	1	4	6	8	9	1	63

*Calculated as Renewed Permits who were federal or reported state landings in 2018, but did not submit a supplemental report
Data source: Fixed Gear Supplemental Reports, Permitting Data, Trip-level reports; refreshed 8/16/19, AW

3.3.3 RI DEM Proposal

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
DIVISION OF MARINE FISHERIES
Three Fort Wetherill Road Jamestown, Rhode Island 02835

March 17,
2020

Michael Pentony, Regional Administrator NOAA Fisheries, GARFO
55 Great Republic Drive Gloucester, MA 01930

Dear Mr. Pentony,

The Rhode Island Department of Environmental Management, Division of Marine Fisheries, would like to submit the following proposal for consideration into the LMA 2 portion of the Atlantic Large Whale Take Reduction Plan. This proposal will continue the commitment Rhode Island has to ensure the continued survival of the North Atlantic Right Whale (NARW) through existing trap reduction plans and gear configurations. These measures will continue to reduce the likelihood of serious injury and mortality to NARW while allowing the Rhode Island lobster and Jonah crab fisheries to persist and be profitable during a challenging time for those fisheries.

Sincerely,
Jason McNamee, Deputy Director RIDEM

State of Rhode Island 2020 Plan to reduce Norther Right Whale serious injury and mortality

The State of Rhode Island participates on the NOAA Atlantic Large Whale Take Reduction Team (ALWTRT) as state fisheries managers and industry stakeholders. These seats have extensive background in fixed gear fisheries and offer expert perspectives on operations in both the inshore and offshore lobster and gillnet fisheries. At the last meeting of the ALWTRT in April 2019, the team, through near consensus developed proposals, by state, for lobster conservation management areas which met the 60% risk reduction target for US fisheries. Since that meeting, developing and analyzing measures has been achieved through numerous in-person and conference meetings between the states of Rhode Island, Massachusetts and NOAA Fisheries.
The following proposal summarizes those deliberations and is also reflective of feedback from the Rhode Island Lobster industry in achieving the intended risk reduction target.

Executive Summary
The North Atlantic right whale (NARW) population has experienced anomalously high mortality in recent years, leading fisheries stakeholders to seek strategies for mitigating the risk of entangling whales in fixed fishing gear such as lobster fishing gear. Lobster fishery managers have been tasked with proposing solutions that will meet target goals for the reduction of serious injury or mortality (SIM) to the NARW; proposed measures include reducing vertical lines via the Southern New England (SNE) effort control plan, modifying fishing gear configurations, and implementing seasonal fishery closures.

The SNE lobster stock has been in long-term recruitment failure since the 1990s. To reduce fishing effort, managers in lobster conservation management area 2 (LCMA 2) implemented a six-year lobster trap allocation reduction program in 2016, which will have reduced the number of allocated traps in the LCMA 2 fishery by more than 50% over the 2016-2022 reduction schedule. Rhode Island managers believe that effort reductions attributed to the ASMFC Effort Control Plan (Addendum XVIII) should be credited toward risk reduction targets in this region, as the reduction in fishing effort will have simultaneously reduced entanglement risk by removing gear (vertical lines) from the water.

Staff at the Rhode Island Division of Marine Fisheries (RIDMF) have worked to estimate the number of end lines that have been removed from LCMA 2 waters since 2017, and to forecast the number of end lines that will be removed through the end of the effort reduction program. The calculated risk reduction varies by month as fishing effort changes seasonally however the RI analysis indicates a reduction in vertical lines of greater than 24 % with even greater reductions predicted during the area aggregation period of February through April. Current weak line configurations being employed by the industry have not yet been analyzed by NOAA Fisheries, but we feel the combination of trap reductions, gear and vertical line modifications will result in a risk reduction that reaches the intended target of 60%.

Background
The SNE American lobster stock experienced a decline in abundance in the 1990s, resulting in the introduction of multiple management measures intended to reduce fishing pressure on this resource in LCMA 2. In 1999, Addendum I to Amendment 3 to the American Lobster Interstate

Fishery Management Plan established a trap allocation cap for LCMA 2 permit holders at 800 traps per federal permit/state license.

The decline of the SNE lobster stock was determined to be largely environmentally driven, but further reductions in fishing pressure were deemed necessary to allow for recovery of the stock. To address the need for fishing effort relief for the SNE stock, Addendum XVIII to Amendment 3 to the American Lobster FMP (approved August 2012) introduced a six-year trap allocation reduction program in LCMA

This program was implemented with the purpose of reducing fishing effort in LCMA 2 by 50%, corresponding to an estimated 50% decline in SNE's lobster abundance (Table 1).

Table 1. Lobster management area 2 trap reduction schedule

Fishing year (May 1-Apr 30)	Reduction (Implemented May 1)	Example allocation
2015-2016	N/A	800
2016-2017	25%	600
2017-2018	5%	570
2018-2019	5%	542
2019-2020	5%	515
2020-2021	5%	490
2021-2022	5%	466

In addition to the above effort reduction schedule, Addendum IX created a trap transfer conservation tax in LCMA 2, whereby 10% of the traps that are transferred between permit holders are permanently retired from the fishery, continuing to reduce vertical lines beyond the trap reduction plans termination.

The number of traps reported fished by fishers (using state harvester reports and federal vessel trip report data) has exhibited a clear decline during the first three years of the trap allocation reduction schedule. It is expected that fishing effort levels will continue to decrease through the end of the trap allocation reduction schedule.

Although these effort reductions were initiated for the purpose of conserving the lobster resource, they concurrently achieve the goals of reducing risk to NARW. Any fishing effort reduction resulting from the trap allocation reduction program will inherently provide a reduction in risk to NARWs via removal of vertical lines from the water. Managers of the Rhode Island LCMA 2 lobster fishery thus propose that risk reduction credit be granted for this recent and ongoing effort reduction.

To quantify the extent to which fishing effort has decreased in LCMA 2 due to the trap allocation reduction program, and to forecast the extent to which fishing effort will decrease by the end of the program, staff at Rhode Island Division of Marine Fisheries (RI DMF) have fit a model to the relationship between total lobster trap allocations (LTA) and total number of traps fished in LCMA 2 by Rhode Island fishers, both federally permitted and state licensed.

Whale conservation efforts are concerned with the risk to whales associated with vertical lines rather than traps, so trap estimates were converted to end line estimates. Rhode Island fishers have not historically reported the number of end lines they fish, so the relationship between traps and end lines was estimated based on assumptions about gear configuration reported in Industrial Economics End Line Model (IEc draft vertical line model documentation, 2014). In the absence of empirical data on individual future allocations, we assumed that the overall relationship between traps and end lines for the fishery would remain relatively static. For all LCMA 2 Rhode Island-based fishers, gear configuration assumptions were based on Rhode Island state waters model assumptions as summarized in Table 2.

Table 2. IEC end line model gear configuration assumptions for Rhode Island state waters

Allocation	Number of traps per trawl	Number of end lines per trawl
Up to 50 traps	1	1
51-100 traps	5	2
101-200 traps	10	2
201+ traps	15	2

NOAA Fisheries indicated that 2017 would be the baseline year for assessing risk reduction for the NARW population, so percent reductions in LCMA 2 end lines were calculated assuming 2017 as the baseline. Based on model output, and the trap to endline conversion, there is a projected reduction of 24- 44% (month-dependent) in the number of end lines in LCMA 2 waters set by Rhode Island fishers by the end of the reduction schedule (April 2022), with an average of 38% reduction in vertical lines during the period Feb-April when aggregations of NARW are known to occur in LCMA 2 (Table 3).

Table 3. % reduction in vertical lines 2017-2022 by month

	Estimated max. end lines in water				Forecasted max. end lines in water				Projected Reductions (to end of reduction schedule)	
Month	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**% reduction since 2017**	**2017 confint (95%)**
1	NA	1489	1330	998	1050	962	886	813	39%	(22%, 52%)
2	NA	1110	945	534	679	623	573	526	44%	(29%, 56%)
3	NA	1285	900	687	747	685	630	579	36%	(18%, 50%)
4	NA	2126	1739	1429	1466	1344	1236	1135	35%	(17%, 49%)
5	2863	3291	2793	2705	2515	2306	2122	NA	24%	(9%, 36%)
6	4735	4266	3898	3529	3346	3079	2827	NA	27%	(9%, 42%)
7	5048	4816	4295	4636	3809	3505	3217	NA	25%	(6%, 40%)
8	4810	4211	4106	4527	3553	3270	3001	NA	27%	(9%, 41%)
9	4132	3571	3436	3180	2875	2645	2428	NA	29%	(12%, 43%)
10	3260	2735	2846	2390	2252	2072	1902	NA	33%	(17%, 46%)

	Estimated max. end lines in water				Forecasted max. end lines in water				Projected Reductions (to end of reduction schedule)	
Month	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**% reduction since 2017**	**2017 confint (95%)**
11	2533	2302	2154	1793	1727	1589	1459	NA	32%	(15%, 46%)
12	2006	1835	1829	1420	1394	1283	1178	NA	36%	(20%, 48%)

Vertical Line breaking strength

In addition to the credit in risk reduction from ongoing trap reductions, Rhode Island would like to propose a risk reduction in serious injury and mortality through gear modifications and configurations. The two options proposed would be a requirement for all fishermen in LCMA 2 to utilize a 1700 lbs. breaking strength vertical line at the top 75% or an approved 1700 lbs. contrivance in the form of a weak sleeve inserted at various places in vertical lines based on distance fished from shore and water depth per vertical line length. There are significant reductions in risk with both options, 41% estimated from 1700 lbs. vertical lines on either end at the top 75% of the vertical line and 26 % estimated when a 1700 lbs. insert is used on both ends (Table 4). Inserts are likely less cost prohibitive to the industry and may be more readily available at the time of rulemaking.

Table 4. Weak vertical line measures by area and risk reduction

Line reduction area	measure	% risk reduction
Coast – 3nm	1 insertion at 50%	12.3%
3nm – 12nm	2 insertions at 25% and 50%	12.25%
12nm – Area 3	1 insertion at 35%	2.45%
Area 2 wide	2 vertical lines top 75%	41% RI preferred option

Current vertical line configuration

The Rhode Island lobster industry has been configuring vertical lines with a break away line at the top 1/3 of the vertical line. A sample of this vertical line was sent to Erin Summers at Maine DMR to put through a load test. The line diameters tested were 1/4" and 5/16" knotted together and then each line without knots. The results are in Table 5 below and it was noted that when the knotted line broke it was the first example of a configuration that broke and left no knot.

Table 5. Load test results of RI vertical lines

Line Diameter (in.)	Load with knot (lbs.)	Load without knot (lbs.)
1/4 X 5/16	631	N/A
1/4 X 5/16	650	N/A
1/4 X 5/16	680	N/A
1/4 X 5/16	662	N/A
1/4	N/A	1115
5/16	N/A	1589

Color marking requirements

ALWTRT members have had concern over the broad gear making requirements of the northeast fixed gear fisheries. Rhode Island supports a more spatially specific gear marking requirement for state specific lobster management area fisheries including expanded marking requirements at multiple locations including visually identifiable top marking requirements.

Minimum number of traps per trawl

Rhode Island does not support substantial changes to the current LCMA 2 minimum number of traps per trawl mainly over safety concerns and vessel size. Much of the small vessel fishery that occurs in the 3-12 nm from shore range are too small to safely accommodate large numbers of traps per trawl. Rhode Island does support a small change in the current ALWTRT plan where vessels fishing 3-12 nm could safely change from 10 traps/trawl to 12/trap per trawl and requests that this change be analyzed for additional risk reduction.

Seasonal Area Closures

Due to the high degree of uncertainty of model outputs, the lack of empirical data on fishing effort and limited whale sightings information, we do not support a closed area at this time. Without the understanding of whether a closed area in an open ocean environment such as LCMA 2 would create a potentially higher risk situation due to things like gear fencing where fixed fishing gear is relocated outside of a closed area creating a denser array of vertical lines. Similarly, recently closed areas of SNE to gillnet fisheries will cause effort to be re-directed with little understanding of what co-occurrence may result. We feel we cannot support such an action without understanding the true impacts to whale interactions. Measures could in fact be more detrimental to the species of concern when the result of the intended action causes the fishing industry and associated gear to re-locate into areas of higher risk.

Summary

Based on discussions with state managers, fishery stakeholders, and the analysis done by NOAA Fisheries of the above proposed measures, we believe this combination of gear changes and trap reductions will achieve the 60% risk reduction target (Table 6). Rhode Island feels confident that recent and future reductions in the amount of fixed gear as well as anecdotal information on the realistic reductions in effort are the best way to mitigate serious injury and mortality of NARW. Less lines in the water means reduced risk.

Rhode Island is confident that our proposed risk reduction strategy through vertical line removal along with additional measures of gear configuration to reduce the likelihood of severe injury or mortality should an entanglement occur will meet the risk reduction target approved by the ALWTRT. Therefore, we ask that the NOAA Fisheries and Regional Administrator accept the Rhode Island proposal to reduce risk to NARW by 60% through the combination of measures listed below.
Table 6. Possible risk reduction measures for consideration

Line reduction by area	Line reduction by measures	% risk reduction
All LMA 2	18% via effort reduction plan	18% RI preferred
SI Closure	Feb-April	8.60%
Weak Line	Insert Configuration	
Coast-3	1 insertion at 50%	12.30%
3-12 nm	2 insertions at 25% and 50%	12.25%
12 nm to MNA 1/3 border	1 insertion at 35%	2.45%
Two End Lines 1700 lbs	75% of vertical line	41% RI preferred

Estimation of reduction in LMA 2 vertical lines during lobster trap allocation reduction program

Rhode Island Division of Marine Fisheries 3 Fort Wetherill Road Jamestown, RI 02835

Contact:

Corinne Truesdale Principal Biologist
Corinne.truesdale@dem.ri.gov

Scott Olszewski Deputy Chief
Scott.olszewski@dem.ri.gov

Executive Summary

The North Atlantic right whale stock has experienced anomalously high mortality in recent years, leading fisheries stakeholders to seek strategies for mitigating the risk of entangling these whales in lobster fishing gear. Lobster fishery managers have been tasked with proposing solutions that will meet target goals for the reduction of lethal entanglement risk; proposed measures include reducing fishing effort, modifying fishing gear, and implementing seasonal fishery closures.

The southern New England lobster stock has been in long-term recruitment failure since the 1990s. To reduce fishing effort, managers in lobster management area 2 implemented a six- year lobster trap allocation reduction program in 2016, which will have reduced the number of allocated traps in the LMA 2 fishery by more than 50% over the 2016-2022 reduction schedule. Rhode Island managers believe that effort reductions due to the trap allocation reduction program should be credited toward risk reduction targets in this region, as the reduction in fishing effort will have simultaneously reduced entanglement risk by removing gear (end lines) from the water.

Staff at the Rhode Island Division of Marine Fisheries have worked to estimate the number of end lines that have been removed from LMA 2 waters since 2017, and to forecast the number of end lines that will be removed through the end of the effort reduction program. Here, a model is presented which shows a **reduction in LMA 2 end lines of 24-44% (month-dependent) between 2017 and 2022, the end of the effort reduction program.** Rhode Island DMF proposes that this estimated reduction in end lines be credited to the Rhode Island LMA 2 lobster fishery when assessing the need for further risk reduction strategies in the region.

Background

The southern New England (SNE) American lobster stock experienced a decline in abundance in the 1990s, resulting in the introduction of multiple management measures intended to reduce fishing pressure on this resource in lobster management area 2 (LMA 2). In 1999, Addendum I to Amendment 3 to the American Lobster Fishery Management Plan established a trap allocation cap for LMA 2 permit holders at 800 traps per permit. In 2006, Addendum IX to Amendment 3 created a trap transfer conservation tax in LMA 2, whereby 10% of the traps that are transferred between permit holders are permanently retired from the fishery.

The SNE lobster stock was determined to be experiencing long-term recruitment failure in a 2010 Atlantic States Marine Fisheries Commission (ASMFC) Technical Committee memo (https://www.asmfc.org/uploads/file/april2010_SNE_Recruitment_Failure_TCmemoB.pdf). The decline of the SNE lobster stock was determined to be largely environmentally-driven, but further reduction in fishing pressure was deemed necessary to allow for recovery of the stock. To address the need for fishing effort relief for the SNE stock, Addendum XVIII to Amendment 3 to the American Lobster Fishery Management Plan (approved August 2012) introduced a six- year trap allocation reduction program in LMA 2. This program was implemented with the purpose of reducing fishing effort in lobster management area 2 (LMA 2) by 50%, corresponding to an estimated 50% decline in southern New England's lobster abundance (Table 1).

Table 1. Lobster management area 2 trap reduction schedule

Fishing year (May 1-Apr 30)	Reduction (Implemented May 1)	Example allocation
2015-2016	N/A	800
2016-2017	25%	600
2017-2018	5%	570
2018-2019	5%	542
2019-2020	5%	515
2020-2021	5%	490
2021-2022	5%	466

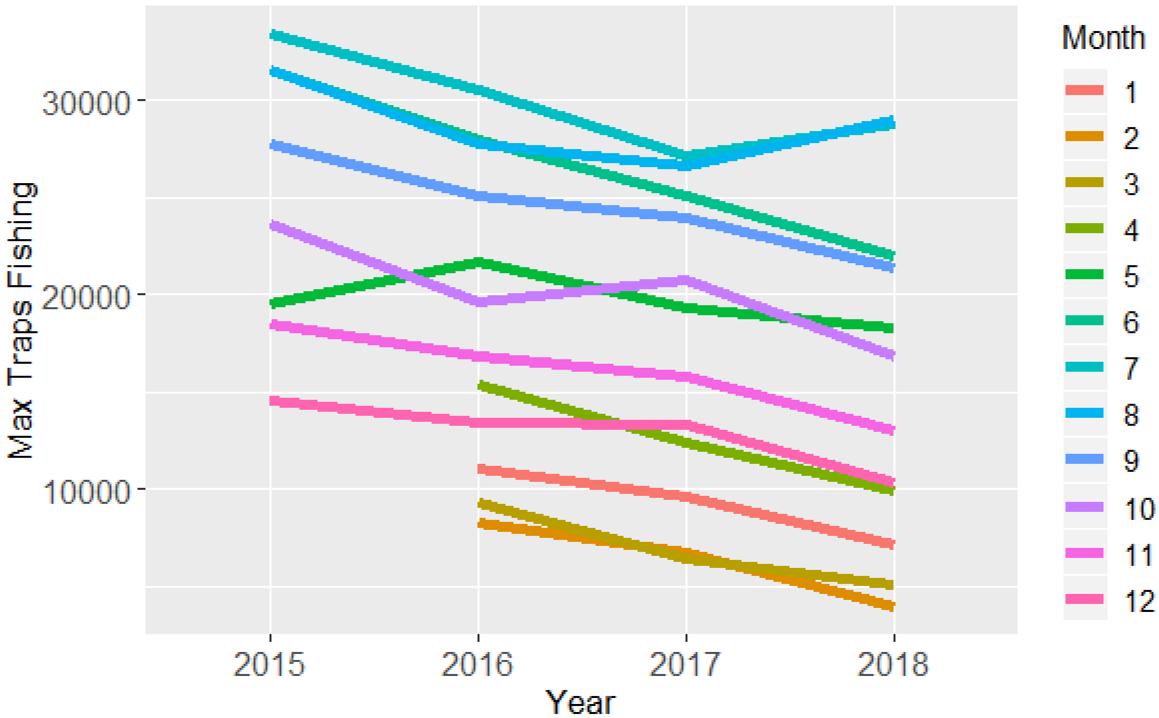


Figure 1. Monthly maximum number of traps reported fished by Rhode Island fishers in LMA 2, May 2015 through December 2018

Due to recent concern for the decline of the North Atlantic right population, the North Atlantic Large Whale Take Reduction Team has worked toward finding solutions to reduce risk of entangling this species in the end lines of trap fishing gear. These solutions are geared toward achieving a threshold for risk reduction in the North Atlantic American lobster fishery. A quantitative risk reduction model is being used to assess the reductions in risk associated with seasonal lobster fishing closures, modified fishing gear, and reductions in fishing effort across lobster management areas 1, 2, and 3.

As mentioned, the Rhode Island LMA 2 lobster fishery is in the middle of the trap reduction schedule which began in May 2015. Since the initiation of this program, substantial reductions in LMA 2 fishing effort are evident. The number of traps reported fished by fishers (using state harvester reports and federal vessel trip report data) has exhibited a clear decline during the first three years of the trap allocation reduction schedule (Figure 1). It is expected that fishing effort levels will continue to decrease through the end of the trap allocation reduction schedule. Although these effort reductions were initiated for the purpose of conserving the lobster resource, they concurrently achieve the goals of reducing risk to North Atlantic right whales. Any fishing effort reduction resulting from the trap allocation reduction program will inherently provide a reduction in risk to North Atlantic right whales via removal of end lines from the water. Managers of the Rhode Island LMA 2 lobster fishery thus propose that risk reduction credit be granted for recent and ongoing effort reduction.

To quantify the extent to which fishing effort has decreased in LMA 2 due to the trap allocation reduction program, and to forecast the extent to which fishing effort will decrease by the end of the program, staff at Rhode Island Division of Marine Fisheries (RI DMF) have fit a model to the relationship between total allocation and total number of

traps fished in LMA 2 by Rhode Island fishers. Methods for fitting this model and its estimates are provided below.

Data

Rhode Island lobster fishers were defined as harvesters who either had Rhode Island state waters lobster fishing permits or had federal fishing permits and landed their catch in Rhode Island ports with a Rhode Island state landing permit. There were a few reported trips over the analyzed time period during which catch was landed in Rhode Island, but the permit holder was predominantly based in another state. These fishers were assumed to be accounted for by their home port states and were excluded from these analyses.

Trip level effort data were collected for years 2015 through 2018 from federal Vessel Trip Reports (VTRs), where applicable, or from Rhode Island state harvester reports. State harvester reports are required to be completed by any Rhode Island permitted vessel that is not required to fill out a VTR. In both VTRs and state harvester reports, fishers enter the number of traps they currently have set in the water. To obtain a conservatively high estimate of the number of traps set by all Rhode Island fishers in LMA 2 on a monthly basis, analyzed month-level effort data consisted of the maximum number of traps reported fished by each harvester within a given month. Thus, the aggregate maximum number of traps reported fished in each month was the upper bound on how many traps were in the water during that time period.

The total number of allocated traps in the Rhode Island LMA 2 fishery was calculated by summing the lobster trap allocations for all active and inactive lobster permit holders (state, federal, and dual permitholders). For predicting effort in years 2019-2021, allocation was calculated by reducing the total allocation from 2018 by 5% in each subsequent year. This provided conservative estimate of total allocation in future years because any reductions due to the trap transfer conservation tax were not accounted for.

Methods

To predict and forecast reductions in LMA 2 lobster fishing effort over the trap allocation reduction schedule, a negative binomial generalized linear model (GLM) was fitted to the relationship between total allocation in the LMA 2 fishery and the number of traps actively fished. The negative binomial distribution is suitable for overdispersed count data (the variance exceeds the mean of the distribution), because it incorporates a parameter to estimate and account for overdispersion. A Quasi-Poisson distribution was also fit to the data, but model diagnostics indicated a better fit from using the negative binomial distribution (for more information about these distributions, see Ver Hoef and Boveng, 2007; White and Bennetts, 1996).

Month was incorporated as a categorical variable because the lobster fishery follows a highly predictable seasonal cycle; fishing is heaviest in the summer months and lightest in in the winter (Figure 1). Results are thus provided on a monthly scale to account for these intra- annual variations in effort.

Whale conservation efforts are concerned with the risk to whales associated with end lines rather than traps, so trap estimates produced by the presented model were converted to end line estimates. Rhode Island fishers have not historically reported the number of end lines they fish, so the relationship between traps and end lines was estimated based on assumptions about gear configuration reported in Industrial Economics, Incorporated's draft end line model (IEc draft vertical line model documentation, 2014). For all LMA 2 Rhode Island-based fishers, gear configuration assumptions were based on Rhode Island state waters model assumptions. These assumptions are summarized in Table 2.

Table 2. iEC end line model gear configuration assumptions for Rhode Island state waters

Allocation	Number of traps per trawl	Number of end lines per trawl
Up to 50 traps	1	1
51-100 traps	5	2
101-200 traps	10	2
201+ traps	15	2

Gear configuration assumptions were applied to maximum traps fished per month by each fisher (based on their total allocation) to arrive at an estimate of the maximum number of end lines in the water in each month. This conversion method was applied to monthly data from 2015 to 2018. For forecasts of fishing effort, a monthly aggregate conversion factor of traps to end lines for 2018 was calculated and applied to monthly traps fished estimates. To obtain trap- to-end line conversion factors, the total maximum number of traps fished in each month was divided by the estimated number of end lines. In absence of empirical data on individual future allocations, we assumed that the overall relationship between traps and end lines for the fishery would remain relatively static. Thus, monthly traps fished estimates for 2019-2021 were divided by the 2018 end line conversion factors to produce forecasts of end lines in the water. Conversion factors for 2015 through 2018 can be found in Table 3.

Table 3. Traps fished to end line conversion factors, 2015 through 2018. Conversion factors for 2018 were used to convert traps to end lines for effort forecasts in years 2019-2021. Estimates in 2015 are not available in months before the beginning of the fishing year, in May.

Trap-to-End line conversion factor			
Month	**20152016**	**2017**	**2018**
Jan	N/A7.43	7.26	7.18
Feb	N/A7.43	7.16	7.50
Mar	N/A7.24	7.13	7.48
Apr	N/A7.25	7.16	6.97
May	6.816.58	6.90	6.77
Jun	6.666.56	6.44	6.24
Jul	6.626.34	6.33	6.21
Aug	6.576.60	6.48	6.41
Sept	6.727.02	6.98	6.72
Oct	7.257.17	7.28	7.04
Nov	7.317.31	7.33	7.29
Dec	7.287.35	7.28	7.28

Results

A summary of the selected negative binomial model specifications and coefficient estimates is provided in Table 4. The selected model incorporates coefficients for individual months and fits allocation as a quadratic predictor of traps fished. The relation between allocation and traps fished is exhibited in Figure 2. The curvilinear relationship indicates that the response of fishing effort to allocation reductions is not constant. Over the course of the allocation reduction schedule thus far—which has reduced total allocation from 118,686 traps to 74,380 traps between 2015 to 2018—the model suggests that the response of traps fished to reductions in allocation was less drastic (slope of the traps fished vs. allocation line is lower) than will be expected as the allocation is further reduced. This could be an effect of initial allocation reductions having primarily removed latent traps from the fishery rather than actively fished traps. Model output in number of traps fished per month is provided in the appendix (Table a1).

Table 4. Coefficients and diagnostics for selected negative binomial GLM.

```
Call:
glm.nb(formula = MaxTrapsFishing ~ poly(Alloc, 2) + Month, data = tlma2_a,
    init.theta = 111.0725188, link = log)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-3.3440  -0.5281  -0.0010   0.6097   1.9231

Coefficients:
                Estimate Std. Error z value Pr(>|z|)
(Intercept)      9.09025    0.05548 163.857  < 2e-16 ***
poly(Alloc, 2)1  0.74057    0.09601   7.713 1.23e-14 ***
poly(Alloc, 2)2 -0.23652    0.09786  -2.417 0.015648 *
Month2          -0.39184    0.07805  -5.020 5.16e-07 ***
Month3          -0.29872    0.07802  -3.829 0.000129 ***
Month4           0.30346    0.07788   3.897 9.76e-05 ***
Month5           0.81490    0.07333  11.113  < 2e-16 ***
Month6           1.10578    0.07331  15.085  < 2e-16 ***
Month7           1.23112    0.07330  16.796  < 2e-16 ***
Month8           1.19251    0.07330  16.269  < 2e-16 ***
Month9           1.02792    0.07331  14.021  < 2e-16 ***
Month10          0.83077    0.07333  11.330  < 2e-16 ***
Month11          0.59947    0.07335   8.173 3.01e-16 ***
Month12          0.38507    0.07337   5.248 1.54e-07 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for Negative Binomial(111.0725) family taken to be 1)

    Null deviance: 1176.205  on 43  degrees of freedom
Residual deviance:   44.297  on 30  degrees of freedom
AIC: 803.04

Number of Fisher Scoring iterations: 1


              Theta:  111.1
          Std. Err.:  24.0

 2 x log-likelihood:  -773.039
```

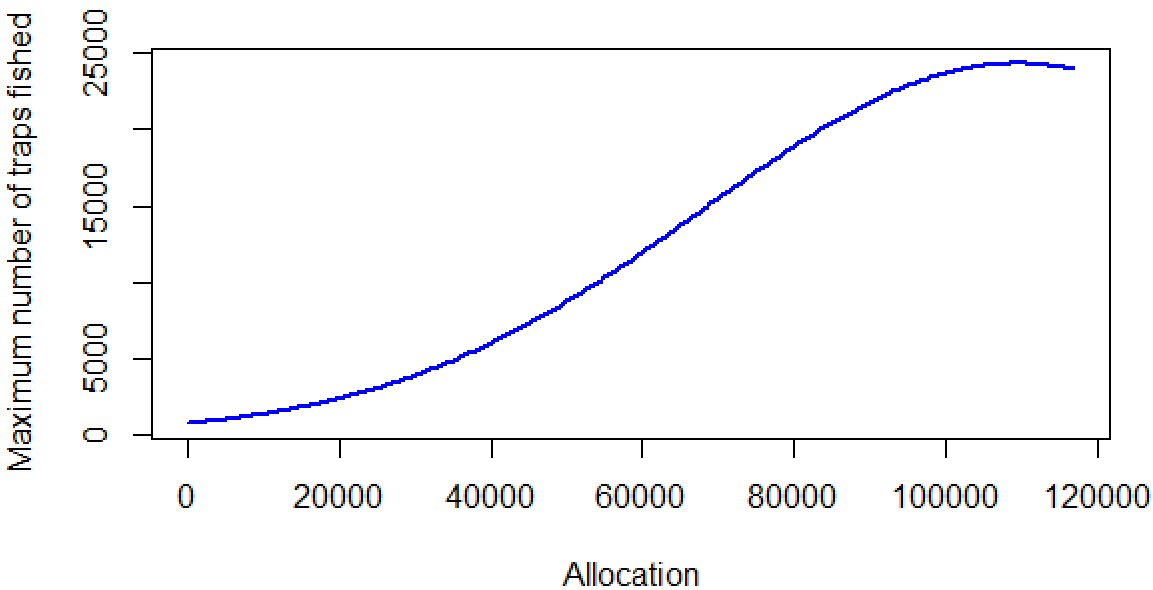


Figure 2. Plot exhibiting the relationship between allocation and maximum number of traps fished as specified by the selected negative binomial GLM.

The North Atlantic Large Whale Take Reduction Team indicated that 2017 would be the baseline year for assessing risk reduction for the North Atlantic right whale population, so percent reductions in LMA 2 end lines were calculated assuming 2017 as the baseline. Based on the output of the select model, which was converted to end lines using the Table 3 conversion factors, there is projected to be a reduction of 24-44% (month-dependent) in the number of end lines in LMA 2 waters set by Rhode Island fishers by the end of the reduction schedule, in April 2022 (Table 5, Figure 3). This percent reduction is estimated to be highest in the winter months (December to March), and lowest in the summer months (June to August).

Table 5. Model estimates of of Rhode Island LMA 2 end lines in the water through the end of the trap allocation reduction schedule. Estimated percent reduction from 2017 to the end of the reduction schedule, with 95% confidence intervals, are provided in green-highlighted columns.

	Estimated max. end lines in water				Forecasted max. end lines in water				Projected Reductions (to end of reduction schedule)	
Month	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**% reduction since 2017**	**2017 confint (95%)**
1	NA	1489	1330	998	1050	962	886	813	39%	(22%, 52%)
2	NA	1110	945	534	679	623	573	526	44%	(29%, 56%)
3	NA	1285	900	687	747	685	630	579	36%	(18%, 50%)
4	NA	2126	1739	1429	1466	1344	1236	1135	35%	(17%, 49%)
5	2863	3291	2793	2705	2515	2306	2122	NA	24%	(9%, 36%)
6	4735	4266	3898	3529	3346	3079	2827	NA	27%	(9%, 42%)
7	5048	4816	4295	4636	3809	3505	3217	NA	25%	(6%, 40%)
8	4810	4211	4106	4527	3553	3270	3001	NA	27%	(9%, 41%)
9	4132	3571	3436	3180	2875	2645	2428	NA	29%	(12%, 43%)
10	3260	2735	2846	2390	2252	2072	1902	NA	33%	(17%, 46%)
11	2533	2302	2154	1793	1727	1589	1459	NA	32%	(15%, 46%)
12	2006	1835	1829	1420	1394	1283	1178	NA	36%	(20%, 48%)

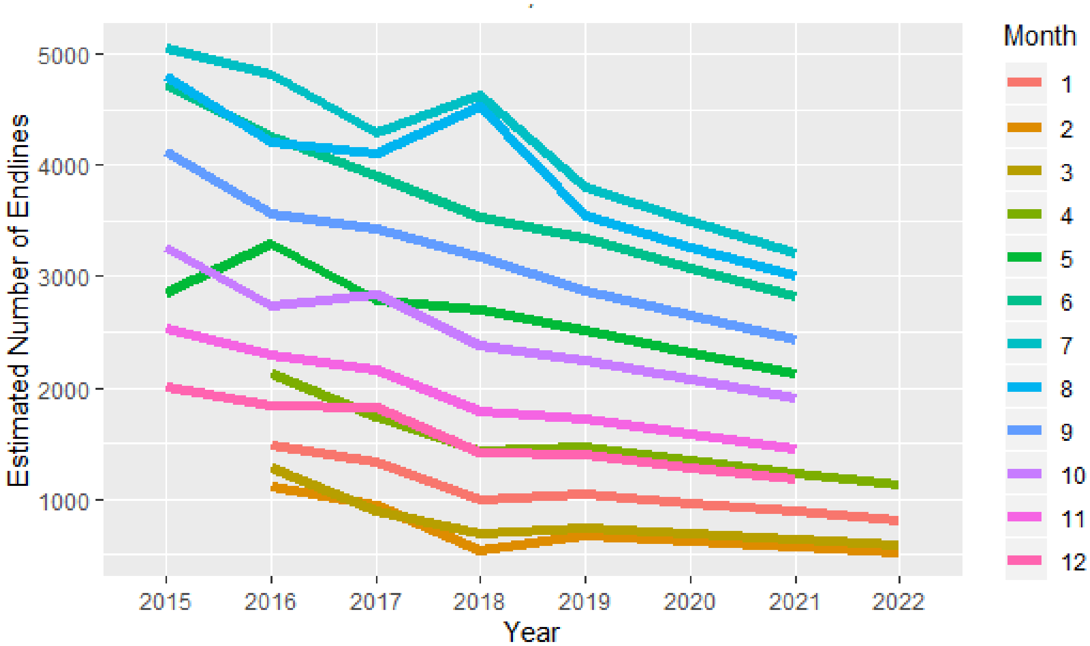


Figure 3. Estimated number of end lines in the water, 2015-2018, and predicted number of end lines in the water, 2019-2021. Estimates for years 2019-2022 are based on forecasts of traps

fished produced by the fitted negative binomial GLM converted to end lines using conversion factors in Table 3.

The fitted model indicates a reduction of 24-44% in LMA 2 end lines fished from 2017 to the end of the ongoing trap allocation reduction program. This reduction, although designed intended to benefit the lobster resource, has simultaneously reduced the risk of entangling right whales in fishing gear. Rhode Island DMF therefore proposes that the reductions calculated in the presented model be credited toward Rhode Island's LMA 2 fishers when considering further risk reduction measures for the LMA 2 lobster fishery.

Ver Hoef, J.M., and P.L. Boveng. 2007. Quasi-Poisson vs. negative binomal regression: how should we model overdispersed count data? Ecology 88(11):2766-2772.

White, G.C. and R.E. Bennetts. 1996. Analysis of frequency count data using the negative binomial distribution. Ecology 77(8):2549-2557.

Table a1. Model predictions of maximum traps fished per month, 2019-2021, and forecasted percent reductions in number of traps fished at the end of the trap reduction schedule (2021-2022 fishing year) compared with baseline year 2017.

	Reported max. traps fished (used in model fitting)				Forecasted max. traps fished				Projected Reductions (to end of reduction schedule)	
Month	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**% reduction since 2017**	**2017 confint (95%)**
1	NA	11067	9653	7164	7539	6910	6359	5838	34%	(20%, 46%)
2	NA	8251	6765	4002	5095	4670	4298	3945	36%	(23%, 48%)
3	NA	9309	6413	5138	5592	5126	4717	4330	26%	(10%, 40%)
4	NA	15415	12448	9954	10212	9361	8614	7908	31%	(16%, 43%)
5	19481	21659	19281	18314	17030	15610	14365	NA	25%	(11%, 38%)
6	31550	27969	25101	22022	20880	19215	17639	NA	30%	(12%, 44%)
7	33437	30511	27172	28807	23669	21781	19995	NA	26%	(8%, 41%)
8	31608	27788	26623	29013	22772	20956	19238	NA	28%	(10%, 42%)
9	27781	25058	23996	21371	19316	17776	16318	NA	32%	(15%, 46%)
10	23650	19600	20735	16831	15860	14595	13398	NA	35%	(19%, 48%)
11	18524	16818	15781	13068	12585	11581	10632	NA	33%	(16%, 46%)
12	14609	13479	13319	10341	10156	9346	8580	NA	36%	(20%, 48%)

Appendix 3.4 A Summary of Comments Received During the Scoping Process

NMFS held a 45-day scoping/public comment period following the August 2, 2019, publication in the *Federal Register* (84 FR 37822) of the agency's Notice of Intent to prepare an Environmental Impact Statement (EIS) for the Atlantic Large Whale Take Reduction Plan (ALWTRP). Oral comments were provided during eight public meetings attended by over 800 people. Over 89,200 written comments were received. Posted letters were received from each New England state's fishery management organization, from the Marine Mammal Commission, Atlantic States Marine Fisheries Commission, the Maine Congressional delegation, and a Maine State representative. Four fishing industry representatives sent comments by mail or email, and over 50 unique letters from fishermen providing details about their fishing practices were received by postal mail, as well as 125 form letters. By email, we received over 120 unique comments, including 30 emails from fishermen or fishing families. Eleven representatives from environmental organizations sent letters and emails, and over 89,000 emails associated with 12 non-governmental organizations' campaigns were received.

Due to the large number of comments, they are organized according to the following specific topics:

- Exemptions
- Safety
- Monitoring
- Gear Marking
- Vertical Line Model
- Gear Modifications
- General Comments

This appendix summarizes the written and oral comments, presenting them in two separate tables. Each comment is assigned to one of five categories:

- **Analyzed**: Comment is addressed in the DEIS.
- **Discussed**: Subject was included in the decision making process in development of alternatives.
- **Proposed Alternatives**: Comment is an element in one or more of the proposed alternatives.
- **Rejected Alternatives**: Comment relates to regulatory alternatives considered but rejected by NMFS.
- **Outside of Scope**: Comment falls outside the scope of the current regulatory action.
- **Will not achieve Purpose**: Comment or proposed action would not fulfill our legal requirement to reduce North Atlantic right whale entanglement severity and frequency.
- **Considered:** NMFS acknowledges the comment and considered it when developing alternatives
- **Duly Noted**: or responding is difficult because the commenter did not articulate specific concerns; did not suggest concrete alternatives; or did not substantiate the position advocated.

The Response to Comments received during the public comment period for the Notice of Intent to prepare an EIS should be considered as a whole, for it collectively reflects NMFS' consideration of public comments. In some cases, NMFS has combined or paraphrased comments. All comments received during the public comment period and the public hearings have been fully considered. NMFS has addressed all written and oral comments.

Topics of Interest by Stakeholder

GENERAL	Citizens	Environmental	Scientist	Fisherperson	Fed/State Manager
Topic Area	**Sub category**	**Sub category**	**Topic Area**	**Topic Area**	**Topic Area**
Exemptions	-	-	-	-	-
Safety	Trawling up	Trawling up	Trawling up	Trawling up	Trawling up
	General	General	General	General	General
Line/Effort Reduction	Trap reduction	Trap reduction	Trap reduction	Trap reduction	Trap reduction
	Line reduction	Line reduction	Line reduction	Line reduction	Line reduction
Monitoring	Fishery	Fishery	Fishery	Fishery	Fishery
	Regs	Regs	Regs	Regs	Regs
Enforcement	-	-	-	-	-
Gear Marking	-	-	-	-	-
Closures and other time/area proposals	S. of Nantucket and Martha's Vineyard	S. of Nantucket and Martha's Vineyard	S. of Nantucket and Martha's Vineyard	S. of Nantucket and Martha's Vineyard	S. of Nantucket and Martha's Vineyard
	Additional areas to consider	Additional areas to consider	Additional areas to consider	Additional areas to consider	Additional areas to consider

GENERAL	Citizens	Environmental	Scientist	Fisherperson	Fed/State Manager
Topic Area	**Sub category**	**Sub category**	**Topic Area**	**Topic Area**	**Topic Area**
	General	General	General	General	General
Stressors	Ship strikes	Ship strikes	Ship strikes	Ship strikes	Ship strikes
	Aquaculture	Aquaculture	Aquaculture	Aquaculture	Aquaculture
	Noise	Noise	Noise	Noise	Noise
	Climate change and food	Climate change and food	Climate change and food	Climate change and food	Climate change and food
	Other	Other	Other	Other	Other
Ecosystem Considerations	-	-	-	-	Ecosystem Consideratio ns
Funding/Subsidies	Fishermen assistance	Fishermen assistance	Fishermen assistance	Fishermen assistance	Fishermen assistance
	Gear innovation funding	Gear innovation funding	Gear innovation funding	Gear innovation funding	Gear innovation funding
	Other	Other	Other	Other	Other
Weak Rope	1700 lbs	1700 lbs	1700 lbs	1700 lbs	1700 lbs
	General	General	General	General	General
Economic Concerns	-	-	-	-	-
Coordination with Canada	-	-	-	-	-

GENERAL	Citizens	Environmental	Scientist	Fisherperson	Fed/State Manager
Topic Area	**Sub category**	**Sub category**	**Topic Area**	**Topic Area**	**Topic Area**
Disentanglement efforts	-	-	Disentangle ment efforts	-	Disentangle ment efforts
Research	Whale distribution	Whale distribution	Whale and Prey distribution	Whale distribution	Whale distribution
	Prey distribution	Prey distribution		Prey distribution	Prey distribution
Ropeless	-	-	-	-	-
Decision Support Tool	-	-	-	-	-
Risk Reduction	Allocation	Allocation	Allocation	Allocation	Allocation
	Target	Target	Target	Target	Target
	Credit	Credit	Credit	Credit	Credit
Other	Support	Support	Support	Support	Other
	General	General	General	General	General

Fisherperson comments

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
Exemptions		Opposed to imposing rules within the ME exempt area, keep exemption line	Considered	Chapter 3, 5, 6
		Anyone with an Area 1 permit should be exempt	Will Not Achieve Purpose	
		1/4 mile buffer is insufficient for inshore fishermen and not enforceable	Considered	
Safety	**Trawling up**	Trawling up within 3 miles is unsafe and not feasible.	Considered	Chapter 3, 5, 6
		NH has maxed out on the number of traps you can trawl safely	Considered	
		Doubles+ are a safety issue and economically unfeasible for single fishers	Duly Noted	
		Lose lives offshore doing 40/50 pot trawls offshore. It is unsafe. Even 30 can be dangerous	Discussed	Chapter 5, 6
		Quads aren't safe to fish	Considered	
		Trawling up could lead to gear conflicts, such as overlaying.	Discussed	Chapter 5
		In Area C, 4 trap trawls would be risky given some fishers sometimes fish alone on small boats making this operation more dangerous for crew	Considered	
		Cannot safely handle longer trawls with my current boat and equipment.	Duly Noted	
		Zone C vessels are not capable of hauling trawls of this size	Duly Noted	
		Multiple traps are dangerous for younger and older fishermen	Duly Noted	
		Many boats aren't equipped for trawling up	Duly Noted	
		Putting a mile of line on a boat is not feasible	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Injuries and deaths are concerns from handling larger trawls with more line.	Discussed	Chapter 3,5, and 6
	General	Danger of going alone	Considered	
		1700 lb rope is feasible in LMA2 but with safety concerns	Proposed Alternatives	Chapter 5
		Re rigging has financial and safety burden that should not be required until thoroughly tested for safety, durability, and efficacy	Considered	Chapters 3 and 5
		Danger of getting caught when setting gear, threatens vessel stability, increased danger when dealing with increases in snarled gear	Considered	Chapters 3,5 and 6
		Sinking groundline led to lost fingers	Outside of Scope	
		Use MEDMR's preliminary breaking strength and load cell data and OSHA standards to analyze safety	Discussed	Chapter 3, 5
Line/Effort Reduction	**Trap reduction**	Believe gear can be removed in area 3, including buoy lines from the water.	Proposed Alternatives	Chapter 3, 5
		Take into account amount of trap reduction that has resulted in a lot of lines being removed	Proposed Alternatives	Chapter 3
		Removing traps would bring it down to 700 traps. This is an adjustable trap limit plan. If the poundage per trap is up by 10 % after 5 years if lbs are down we could have a trap increase. But if the lbs decrease the traps decrease.	Outside of Scope	
		Suggest to reduce trap allocation in LMA 3 in order to make buoyless system work	Outside of Scope	
		Prefer trap limits over trawls	Outside of Scope	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Suggest long term trap/line reduction plan using the zone enter/exit ratio instead of short term reduction to keep fishermen in business	Outside of Scope	
		The effort MA Lobster Fleet in LMA1 has been declining for years now	Discussed	Chapter 5
		Area 1 lobster is not overfished and trap reductions should only be used for stock concerns. Any reduction in traps just to reduce endlines is vindictive when you have other options available to reduce risk to these whales	Duly Noted	--
	Line Reduction	Trawling up affects fishing efficiency and isn't possible for small boats	Analyzed	Chapter 6
		Reducing the amount of lobster traps to reduce entanglements and maximize profits	Outside of Scope	
		Line reduction through trawling up/doubles will create more gear conflict	Considered	Chapters 3,5 and 6
		Do not support line reduction	Duly Noted	
		The best way to reduce entanglement risk is to remove vertical lines from the water	Proposed Alternatives	Chapter 3, 5
		Fish triples or 5s, can go with end line tags	Analyzed	Chapter 5
		4 trap trawls on rocky bottoms near the islands would be impossible and there isn't enough space	Duly Noted	
		Low density of lines in LMA3, need a buoy line on each end of trawl due to deep water and strong current	Discussed	Chapter 5
		Offshore most fish at 5 traps per trawl anyways	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Zone C, 800 traps, no trawls but fishes double traps: quads will be difficult in the area because of the number of fishermen	Duly Noted	
		Prefer endline allocation rather than trap reduction, but need better enforcement to prevent fishermen cutting other's line when gear conflicts happen	Proposed Alternatives	Chapter 3, 5
		The MLA rejects the management approach put forward in the Scoping Document to reduce Maine's vertical lines by 50%	Duly Noted	
Monitoring	**Fishery**	Let the lobstermen fill out surveys for fishing and gear configuration information to inform what can be fished safely	Considered	Chapter 3,5
		Need information on industry compliance	Discussed	Chapter 3
		Especially for areas with continued open access, need to monitor to ensure true line reduction. Monitor for increase effort offshore where there are more threats to whales	Analyzed	Chapter 3, 5
		Require all federal permit holders to report locations	Discussed	Chapter 3
	Regs	Want monitoring of regs to determine effectiveness	Discussed	Chapter 3
Enforcement		Consider how the proposed alternatives will be enforced/whether they are enforceable.	Discussed	Chapter 3
		Need better enforcement to prevent fishermen cutting other's line when gear conflicts happen	Duly Noted	
		Boats of a certain size will not be able to comply with the regulations	Considered	Chapter 3, 5
		Need a vessel for offshore enforcement, not just offshore Area 1, Area 3 as well	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Ropeless enforcement is an issue	Duly Noted	
		Need better enforcement	Duly Noted	
		Enforcement is a critical component of any ALWTRP rule change, yet fishermen are continually discouraged with the lack of oversight and enforcement in federal waters; need an offshore enforcement vessel	Discussed	Chapter 3
Gear Marking		Support marking gear	Proposed Alternatives	Chapter 3, 5
		Support country of origin line marking system so US has a tracer through whole line, area tracers as well	Rejected Alternatives	Chapter 3
		Work with gear manufacturers to develop affordable manufactured solutions for discrete segments of US fisheries gear marks or allow multiple marking methods	Duly Noted	
		Suggest gear marking in exempt area to show it isn't a problem	Proposed Alternatives	Chapter 3, 5
		Support gear marking across the fishery and adding any color or size gear markings that will fit through my hauler without fouling it, so long as it shows my gear is not involved in whale entanglements.	Duly Noted	
		Marking requirements should accommodate regular re-rigging of endlines to fish at drift. depths; so do not identify exact distances apart. Eg. lines fished in certain deep water shelf edges in LCMA3 can be up to 2400 feet (400 fathoms); most active Area 3 vessels deploy 50 to 75 endlines.	Proposed Alternatives	Chapter 3
		Some do not support gear marking	Duly Noted	
		3 foot mark good, but feasibility unsure	Analyzed	Chapter 5

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Put pressure on rope manufacturing - put tracer through entire line, unique to each area	Analyzed	Chapter 3, 5
		Want states to have separate gear markings	Proposed Alternatives	Chapter 3
		Suggest the use of twine interweaved in endlines	Will Not Achieve Purpose	
		Gear marking will lose color when soaked in water over a week	Duly Noted	
		Maine traps and buoys are already marked, a single tracer should be sufficient	Rejected Alternatives	Chapter 3
		Marking is already being done outside the exemption line and should be sufficient	Rejected Alternatives	Chapter 3
		In to shoal water for marking	Duly Noted	
		Gear marking does very little	Duly Noted	
		Support gear marking but would be difficult for fishermen fishing in different areas	Duly Noted	
		Need better gear marking methods and need to see results from marking	Duly Noted	
		Maine lobster gear should be marked so it is uniquely identifiable.	Proposed Alternatives	Chapter 3
		Gear from each state should be uniquely identifiable.	Proposed Alternatives	Chapter 3
Closures and other time/area proposals	**S. of Nantucket and Martha's Vineyard**	Consider closed areas, particularly in Nantucket	Proposed Alternatives	Chapter 3
	Additional areas to consider	Look at cape cod bay for entanglement issues	Analyzed	Chapter 5
	General	Don't think closures work (dead whales have been found in Cape Cod Bay)	Duly Noted	
		Some do not support any closures	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		TRT did not propose because they don't work due to unpredictable ecosystem and habitat use changes	Duly Noted	
		Closures have unintended consequences such as: fencing within and between fishery gear conflicts due to changed fishing locations, habitat impacts, economic impacts and inequitable treatment of fishing operations. Need to be dynamic but hard to analyze because can't predict where gear will be moved to.	Duly Noted	
		Dynamic closures don't work with US rulemaking hurdles, plus impossible for vessels to move gear quickly, especially in bad weather. Area 3 vessels can only move 304 trawls in a trip.	Duly Noted	
		Will avoid areas where entanglements might be likely.	Duly Noted	
		Closures may cause redistribution of effort and exacerbate the issue	Analyzed	Chapter 5
Stressors	**Ship strikes**	Ship strikes are a bigger concern	Discussed	Chapter 8
		Impose speed restrictions as well especially if closures will be implemented	Outside of Scope	
		Ship strikes (including potential navy ship strike, shipping industry, cruise ships, night time boaters)	Outside of Scope, Discussed	Chapter 8
	Aquaculture	Aquaculture, permitting more vertical lines for aquaculture	Outside of Scope	
	Noise	Concerns for Seismic testing for oil and natural gas	Outside of Scope, Discussed	Chapter 8
		US Navy and sonar present concern	Outside of Scope, Discussed	Chapter 8

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Consider wind farm/acoustic impact on whales	Outside of Scope, Discussed	Chapter 8
	Climate change and food	Consider climate change and its impact on whale health/food source	Discussed	Chapter 8
		Some of the direct effects of warming and increased PCO2 on lobster larvae as well as the copepods	Discussed	Chapter 8
		Nutritional concerns and decline of food source	Discussed	Chapter 8
	Other	Derelict fishing gear	Analyzed	Chapter 5
		Risk in increased use of pesticides that threaten the food supply on right whales	Discussed	Chapter 8
		Plastic ingestion	Discussed	Chapter 8
		Whale watch industry	Discussed	Chapter 8
		Analyze potential increase in lost gear	Analyzed	Chapter 5
		Low reproduction from food restriction and entanglement	Discussed	Chapter 2, 5
Ecosystem Considerations		Protect the top levels of the fisheries food chain	Duly Noted	
		Oceanographic and climate changes being recorded that show vast movement in the right whale population, and changes and movement in the fisheries as well	Discussed	Chapter 5, 8
Funding/Subsidies	**Fishermen assistance**	Provide stipend for time/energy necessary to make modifications to gear or boat	Outside of Scope	
		Fishermen compensations	Outside of Scope	
		Provide subsidies	Outside of Scope	
	Other	Federal permit buy backs	Outside of Scope	
		Hopes the senator finds money to help mitigate the impact of ships on whales	Outside of Scope	
		Conservation groups can help find funding	Outside of Scope	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Regulations require more funding to stay compliance.	Outside of Scope	
Weak Rope	**1700 lbs**	Try 1900-2000 lbs, would reduce to 1700 quickly, less times to replace rope, would be more compliance	Rejected Alternatives	Chapter 3
		Thinks a calf in Mass can break out of 1700 lb rope because they use 1500 lb rope. otherwise replaced more often	Duly Noted	
		More frequent replacement of 1700 lb line	Duly Noted	
		Keep 1700 lb rope to top half or top ⅔ - keep short	Rejected Alternatives	Chapter 3
		1700 lb seems like can work. Changing % by depth fished makes sense.	Discussed	Chapter 3, 5
		1700 lb rope is a solution, when fishing less than 100 feet, use entire weak rope; greater than 100 feet, use 100 feet addons.	Rejected Alternatives	Chapter 3
	General	Question over effectiveness	Duly Noted	
		Use predetermined bleach soak time to weaken rope (tested with specific brands/breaking strength)	Rejected Alternatives	Chapter 3
		Potential issue with practicality of braided line in the middle	Duly Noted	
		Weak rope is an issue in rocky areas, may increase lost gear	Analyzed	Chapter 5
		For years been using 1500 lb braided, twisted line breaks down in strength.	Duly Noted	
		Some do not support weak rope, a particular issue in rocky areas	Duly Noted	
		The Association supports the uses of “contrivances” to lessen the breaking strength of end lines during entanglement events. However, the Association opposes a universal requirement to use ≤1700 lb breaking strength rope	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		The MLA rejects the management approach put forward in the Scoping Document to require weak rope on the top half of vertical lines in Maine's federal waters.	Duly Noted	
		Can't use weaker rope with longer trap trawls, larger rope already breaks with 15 trap trawls often	Considered	Chapter 3 and 5
		Sleeves do not work because it takes much time and costs to use it. You need two sets of ropes to fish in different depth.	Duly Noted	
		Test cheaper alternatives to weak lines such as soaking them in bleach.	Duly Noted	
		Weakening a line throughout its entire length, as opposed to a single weak point, will do more to reduce the severity of these entanglements than other options	Analyzed	Chapter 5
		Many applications including the South Shore Sleeve are costly and labor intensive. We understand that a suite of reduced breaking strength (RBS) options/modifications intended to minimize cost and effort will be available to satisfy this rulemaking	Duly Noted	
Economic Concerns		Examine community economic health/impact	Analyzed	Chapter 6
		A mass fisherman fishing singles catches double what others do, helps keep up with cost of living?	Duly Noted	
		50% endline reduction would cost 30-35% of income	Analyzed	Chapter 6
		Re Rigging has costs, don't require until fully tested and proven effective and safe	Duly Noted	
		Lowering the trap limit our poundage goes up and our cost lowers.	Discussed	Chapter 6

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Longer trawls mean buying bigger boats and an excess of unused smaller boats	Duly Noted	
		Boat modifications will cost money to comply with trawling up	Analyzed	Chapter 6
		Costs of compliance vary by business	Analyzed	Chapter 9
		Time and money to maintain. Consider cost of replacing rope. He replaces 10% line annually.	Analyzed	Chapter 6
		Make sure it's effective before requiring so new modifications won't be needed in a couple of years	Duly Noted	
		Gear modifications cost extra	Analyzed	Chapter 6
		Bait is expensive and catch is mediocre. Flexibility is key to maintaining our diverse fleet	Analyzed	Chapter 6 and 9
		Re rigging has financial and safety burden that should not be required until thoroughly tested for safety, durability and efficacy	Duly Noted	
		This recent set of proposals lacks a scientific basis and will inflict great harm to our community while having no meaningful impact on the survival of the right whale	Duly Noted	
		Additional help difficult to find and will be needed for trawling up	Duly Noted	
		If Maine were proven to be a concern, we would need a 5-year plan to modify the fishery to support the community	Duly Noted	
		Will be forced to retire	Duly Noted	
		Will increase lost gear	Analyzed	Chapter 6
		$80,000 cost predicted to modify	Analyzed	Chapter 6
		Zone 2, 200 traps: worries about those depending on fishing	Analyzed	Chapter 6

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		$50,000 required to change rope and 400-500 hours of unpaid work to rig new groundline	Analyzed	Chapter 6
		Jobs should come before a whale	Duly Noted	
		$3,500 for more endlines and a couple of weeks of modification	Analyzed	Chapter 6
		Running gear back and huge snarls are concerns, not being able to recover gear	Duly Noted	
		Reducing traps or end lines will reduce revenue by 50%	Analyzed	Chapter 6
		Will impact all of the town's economy contributing to loss of businesses, jobs, and create higher taxes, lose schools (especially in smaller communities)	Duly Noted	
		Concern over the time period between regulation and the implementation date to achieve compliance, especially if regulation will require 100% compliance by May 2020.	Duly Noted	
		The cost associated with line/trap reductions, such as hiring additional help, buying new/replacing gear, or loss of fishing efficiency or time spent to modify gear (i.e., time), will create and economic hardship.	Analyzed	Chapter 6
		Estimated cost to modify vessels may be approximately $10,000.	Analyzed	Chapter 6
		20% of income would go to new ropes, hydraulics, stern extension, hoses, motor, tank, and fittings to be able to comply with proposed regulations	Analyzed	Chapter 6
		Economy depends on lobster industry and modifications will affect communities' economies significantly by loss of revenue or jobs.	Analyzed	Chapter 6

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Small boat fishery would be lost due to modifications	Duly Noted	
		Fishermen have suffered enough from high bait price and low lobster price	Duly Noted	
Coordination with Canada		Urge to regulate Canadian fisheries with whale safe measures	Discussed	Chapter 3
		50% whale responsibility for US lobster fishery is unfair	Duly Noted	
		Canadian waters have contributed more to recent year RW mortalities	Discussed	Chapter 2, 4
Disentanglement efforts		Train lobstermen as whale observers and disentangle teams	Rejected Alternative	
Research	**Whale distribution**	Right whales have not been sighted to overlap with the distribution of the lobster fishery	Duly Noted	
		Track whales through tagging	Outside of Scope, Duly Noted	
		Acoustic monitoring	Discussed	Chapter 3
		Increase aerial survey coverage and occurrences	Discussed	Chapter 3
		Need better monitoring of whales in US shipping lanes, particularly south of Nantucket.	Discussed	Chapter 3
		Tracking the whales migration patterns, understanding environmental issues affecting the whales feed and supply of same need to be done	Discussed	Chapter 3
		Need better whale distribution data for more rules	Discussed	Chapter 3
		More research on behavior - is feeding behavior more risky for entanglement than traveling whales	Outside of Scope, Duly Noted	
		DMR is going to try and find some funds to try and do aerial surveys.	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Need to study whether there is any interaction with the whales and Maine lobster gear	Duly Noted	
	Prey distribution	Research copepods and develop predictive zooplankton model	Outside of Scope, Discussed	Chapter 3
Ropeless		Not possible in short or medium term. Offshore fishermen willing to continue to work with developers	Duly Noted	
		Ropeless gear won't apply to rocky bottom, and too expensive to afford it	Duly Noted	
		Ropeless gear has been successfully tested in 40-140 feet of water	Duly Noted	
		Need to set up a system to prevent the mobile gear fleet from interacting with the buoyless system.	Discussed	Chapter 3, 5
		An EFP option remains desirable within the Atlantic Large Whale Take Reduction Plan and hope that this remains a priority for NOAA	Discussed	Chapter 3
		Buoyless fishing isn't feasible	Duly Noted	
		Most of traps are in shoal waters and are incapable of trawls using buoyless	Duly Noted	
		There's not a chance ropeless tech will survive actual commercial fishing, nor can it even be used in a competitive fishery	Duly Noted	
Decision Support Tool		Should be looking at 2015 and not 2017. 2017 should only apply to areas that haven't made an effort to reduce vertical lines.	Duly Noted	
		Should look at decline since 2010, period of analysis, to capture line reductions in those LMAs that have implemented effort controls and limited entry programs	Discussed	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Start from scratch	Duly Noted	
		Was designed for closure and has been overused	Duly Noted	
		DST isn't capturing recent reductions in effort	Considered	Chapter 3
		Need to consider other factors into risk reduction model like water temperature, feed etc.	Considered	Chapter 3, Appendix 3.2
		Need more data, update the science	Duly Noted	
		Use all of the new data available	Discussed	Chapter 3
		Use the aquariums 72% published risk estimate	Duly Noted	
Risk reduction	**Allocation**	Keen on the idea of equity, split between US and Canada as well as among areas in the US	Discussed	Chapter 2
		Consider takes by state so Maine is exempt	Duly Noted	
	Target	The MLA continues to reject NMFS' 60% risk reduction goal for the Maine lobster fishery because it is unsupported by documented evidence of interaction between right whales and Maine lobster gear.	Duly Noted	
	Credit	Happy about 18% credit, but want to see more credit, started reductions in 2015, so need credit for that in the model.	Duly Noted	
		Prior and ongoing efforts to reduce the amount of gear fished should be given risk reduction credit.	Proposed Alternatives	Chapter 3
		Credit for existing area 2 trap reductions. already very little line that is not captured in the DST	Proposed Alternatives	Chapter 3
		We appreciate the risk/line reduction credit the substantial closure of the 3000 square nautical miles, known as, "Massachusetts Restricted Area" has achieved within the current rule making process	Proposed Alternatives	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
Other	**Support**	Support what came out of TRT	Duly Noted	
	General	Need a seat at TRT for Maine lobster union	Duly Noted	
		People who fish should make the rules	Duly Noted	
		Consider what the states propose	Considered	Chapter 3
		Any new rules applied to Maine fisherman should only be applied to large distances from shore (30+ miles) as we have minimal to no interaction inside of that.	Rejected Alternative	Chapter 3
		Apply same rules to all LMA3 and federal permitted lobstermen equally	Duly Noted	

State Manager/Congress/Marine Mammal Commission

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
Exemptions		Regulating exempted waters would not have a benefit to right whales	Duly Noted	
		Preserve the exemption line	Considered	Chapter 3
Safety	**Trawling up**	Trawling up is a safety concern	Considered	Chapter 3, 5, 6
		Triples or quads will be very difficult for skiff and the older generation lobstermen	Duly Noted	
		Longer trawls have safety issues: excessive rope on deck, less space on deck, less visibility by higher stacks of traps, more weight on deck	Considered	Chapter 5, 6
		Trawling up for offshore fisheries will create safety issues	Considered	Chapter 5, 6
		Longer trawls will increase the risk of accidents that could put lives at stake	Considered	Chapter 5, 6
		Safety would be a huge concern for me, and the vast majority of the fleet if we were forced into larger configurations, especially in shoals, closer waters, where gear density is higher, and whale frequency is non existent	Duly Noted	
	General	Weak rope also has safety issues	Discussed	Chapter 6
Line/Effort Reduction	**Trap reduction**	Consider trap and buoyline reductions that have already occurred in the areas 2 and 3 in DEIS analysis	Proposed Alternatives	Chapter 3
		Eliminating single traps in Mass is not effective (in summer along coast with no whales present)	Duly Noted	
		ASMFC Add 18 (really 21/22) had trap cap reductions, will help get us to where we need to be	Duly Noted	
		GARFO need to take action on trap cap reduction.	Outside of Scope	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Vertical line reduction can be achieved by reducing fishing effort	Outside of Scope	
		Absolute effort reduction and may be the only effective solution and should be considered by NMFS	Outside of Scope	
	Line reduction	Consider buoy line reductions that have already occurred in the areas 2 and 3 in DEIS analysis	Proposed Alternatives	Chapter 3
		Get a cap on the offshore endlines	Proposed Alternatives	Chapter 3
		Trawling up hard to regulate but should be done for those that have deck space.	Duly Noted	
		Longer trawls offshore are only workable on some vessels	Duly Noted	
		Trawling up is impractical for inshore fishermen	Duly Noted	
		Trawling up reduces gear efficiency	Analyzed	Chapter 6
		Substantial reductions in vertical line numbers in all states and LMAs	Proposed Alternatives	Chapter 3
Monitoring	**Fishery**	Supports measures expanded harvester reporting	Discussed	Chapter 3
		Collaborating with the states to collect complete information on lobster fishing effort (e.g., numbers of end lines)	Duly Noted	
		NMFS, in cooperation with the states, take immediate steps to collect data to provide reliable information on the numbers of end lines in use before and after the implementation of any line reduction measures, thus allowing the effectiveness of such measures to be assessed	Duly Noted	
	Regs	Management measures adopted through rulemaking should be studied to assure the measures are effectively reducing risk after implementation.	Discussed	Chapter 3, 5

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Needs to contain provisions to assess the effectiveness of those measures and modify them promptly if the take reduction goal(s) of the MMPA are not achieved.	Discussed	Chapter 3, 5
Enforcement		Increased efforts from NOAA OLE, in coordination with the states, can lead to effective and timely prosecution of cases.	Duly Noted	
		Enforcement in offshore waters should be made a priority by NOAA Fisheries, e.g. obtain a large vessel that is capable of hauling gear and could operate year-round in offshore areas.	Duly Noted	
Gear Marking		Support expanded gear marking	Proposed Alternatives	Chapter 3
		State wide gear marking in Maine	Proposed Alternatives	Chapter 3
		If replace 20% of lines in each year, would have all line marked in 5 years.	Rejected Alternative	Chapter 3
		Collaborate with the states to implement comprehensive gear marking.	Considered	Chapter 3
		The use of any other proven measures that will reduce entanglement severity, such as high-visibility rope	Rejected Alternatives	Chapter 3
		Vertical line reduction can be achieved by prohibiting fishing in areas where and/or at times when whales are most likely to be present either with fixed (like Massachusetts) or dynamic (like Canada) time-area closures	Proposed Alternatives	Chapter 3
		Time-area closures to protect the largest and most predictable concentrations and migratory pathways of right whales	Proposed Alternatives	Chapter 3
		Time area closures in the fishery may be the only effective solution and should be considered by NMFS	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		NMFS evaluate the use of dynamic closures in the DEIS, such as those that have been implemented in Canada. NMFS tried to use fishery DMAs in the past and rejected their use due to logistical difficulties faced by fishermen, but the DEIS should, at a minimum, identify the logistical, economic, and operational difficulties, and discuss potential solutions.	Outside of Scope	
Stressors	**Ship strikes**	Ship strikes (including navy ships without speed limits)	Outside of Scope, Discussed	Chapter 8
	Aquaculture	NMFS should reconsider offshore aquaculture.	Outside of Scope, Discussed	Chapter 8
	Noise	Sonar	Outside of Scope, Discussed	Chapter 8
		NMFS should reconsider offshore wind.	Outside of Scope, Discussed	Chapter 8
		NMFS should reconsider seismic testing.	Outside of Scope, Discussed	Chapter 8
	Climate change and food	Whale distribution is changing along the change of the food sources and GOSL is the new food source for RW	Discussed	Chapter 8
Funding/Subsidies	**Gear innovation funding**	Explore rapid and intense research into different gear config.	Outside of Scope	
	Other	Increase funding for the Joint Enforcement Agreement which would allow for more extensive coverage of MMPA and ESA regulations.	Outside of Scope	
		Funding research on the relationships between types of gear and the severity of injuries	Outside of Scope	
Weak Rope	**1700 lbs**	The use of 'weak' rope (1,700-pound equivalents) in every pot/trap fishery	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		If more time was given to experiment 1700 lbs weak links it could be a solution for everyone's problems	Duly Noted	
	General	Should use weak links/rope	Proposed Alternatives	Chapter 3
		No change to gear configurations in state waters	Rejected Alternative	Chapter 3
		Load cell testing says feasible for 50 fathoms and shallower.	Duly Noted	
		Look at having 1 week vertical line and 1 strong vert line.	Analyzed	Chapter 3, 5
		Supportive of ways to weaken line. Put another weak link lower in line.	Proposed Alternatives	Chapter 3
		Sleeves and 1,700-pound rope are not now commercially available in sufficient quantities to supply all U.S. lobster fisheries; this creates some uncertainty regarding their feasibility as entanglement mitigation measures in the short term.	Duly Noted	
		For alternatives that include the weak sleeve option, that NMFS undertake a careful analysis of the pertinent science and make use of modeling to determine the optimal distance between sleeves for right and other large whales, and include that distance in its DEIS analyses and proposed regulations	Considered	Chapter 3, 5
		Sleeves have not been scientifically tested and it is unknown how they will perform in entanglement situations.	Duly Noted	
Economic Concerns		Continue to work with industry and staff to develop a plan that does not have adverse social and economic effects on the industry.	Considered	Chapter 3, 4, 6
		Ban import of Canadian lobster or snow crab until on par with US	Outside of Scope	
		Trap reduction will make offshore fishermen hard to make a profit	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		The gear configuration of longer trawls reduces the efficiency of each lobster trap, which may impact the profitability of individual operations.	Analyzed	Chapter 6
		A 50% reduction in endline would be catastrophic financially for me	Analyzed	Chapter 6
Coordination with Canada		NMFS continue and expand on these efforts and that the importance of working with Canada be reflected in the DEIS. Among other things, the DEIS might usefully discuss the applicability of the MMPA fish import rule in helping to ensure that Canada's take reduction program for its fisheries is and remains comparable to that of the United States.	Outside of Scope	
		NMFS should take into account the aggressive conservation program administered by the Commonwealth and its fishermen during the rulemaking process.	Duly Noted	
		The DEIS might also consider steps to formalize ongoing coordination and collaboration with Canada on take reduction and monitoring through a binding bilateral agreement.	Outside of Scope	
Research	**Whale distribution**	Support aerial surveys	Discussed	Chapter 3
		Support increased NARW surveillance, aerial and acoustic	Discussed	Chapter 3
		Support tagging/tracking whales	Outside of Scope	
		Continue and expand visual and acoustic whale surveys (including an assessment of how frequent and extensive such surveys need to be to meet management objectives),	Outside of Scope	
Ropeless		Eliminate vertical lines through ropeless-seen as the solution that can reduce lines without reducing fishing effort	Discussed	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		If it turns out that the offshore lobster fishery cannot make the weak-rope option work, then NMFS should require the offshore fishery to make the transition to ropeless gear on an aggressive, time-bound schedule.	Duly Noted	
Decision Support Tool		Reconsider the use of the "baseline year" of 2017	Will Not Achieve Purpose	
		Within the 100m isobaths has low Calanus but is not included in the habitat model	Duly Noted	
		Would like improved habitat suitability model	Duly Noted	
		NMFS should utilize the 72% published estimate of risk reduction (Knowlton et. al 2015)	Considered	Chapter 3, 5
		NMFS should be cautious about the impacts and measurability of additional "trawling up" scenarios	Analyzed	Chapter 5, 6
		Conducting further research on the relationships between types of gear and the severity of injuries	Outside of Scope	
		Measures contained in rule are as certain as the best available science can assure to reduce serious injury and mortality to below PBR. The decision-support tool is built on the best available data and science, and, along with other tools, analyses and sources of information, is the tool that should guide NMFS in the EIS and rulemaking process	Considered	Chapter 3
Risk Reduction	**Allocation**	Focusing all of the risk reduction efforts on Maine's lobster fishery is not sufficient for protection of the species	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Review methodology which attributes serious injury and mortality from unattributed gear to the US and Canada. Examine two time series of entanglement data, 2010-2018 and 2013-2018, when assigning serious injury and mortality from unattributed cases to the two countries.	Discussed	Chapter 2
		Re-evaluate the current risk reduction target, as the data indicate that Canadian fisheries have an increased role in the serious injury and mortality of NARWs	Duly Noted	
		Detected serious injury and mortality should be considered a minimum, as 40-50 percent of all presumed dead right whales go undetected.	Discussed	Chapter 2
		NOAA need re-consider the attribution of unknown whale entanglement cases to fishery and country	Duly Noted	
		Increase in Canadian mortalities needs to be considered when developing alternatives	Discussed	Chapter 2, 3
		Consider region-wide as well as state specific approaches for reducing those risks.	Proposed Alternatives	Chapter 3
	Target	NMFS should develop and include alternatives designed to achieve an 80 percent reduction in entanglement risks	Considered	Chapter 3
	Credit	Give credit for Mass closure	Proposed Alternatives	Chapter 3
		ME DMR requests NOAA include a method for conservation equivalency within the proposed rule.	Discussed	Chapter 3
		NMFS should take into account the aggressive conservation program administered by the Commonwealth and its fishermen during the rulemaking process.	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Consider major actions taken by Mass (including speed restrictions), and give credit for closure	Proposed Alternatives	Chapter 3
Other	**General**	Measures to fishermen fishing in the same federal areas should be equitable, spread burden among states	Considered	Chapter 3
		NMFS should propose only measures that apply equally to fishermen from ALL states who fish in commonly fished federal waters	Rejected Alternatives	Chapter 3
		An immediate next step should be for NMFS to undergo the process necessary to promulgate equivalent regulations for all U.S. fisheries that entangle, or have the potential to entangle, right and other large whales.	Outside of Scope	
		Consider how the rule can be implemented by zone or subregion while considering the diversity and geographic features of ME	Considered	Chapter 3
		Other regions step up to the same level of protection as Massachusetts	Duly Noted	
		Need protocol to put people on boats to see gear testing	Outside of Scope	

Scientist

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
Exemptions		No exemptions for gear marking	Proposed Alternatives	Chapter 3
Safety	**Trawling up**	Fishing more than two traps per trawl is neither practical nor safe for many of our boats	Duly Noted	
Line/ Effort Reduction	**Line reduction**	Benefits of trawling up will be negated if rope gets heavier	Analyzed	Chapter 5
Enforcement		LMA3 lacks of enforcement and need ropeless gear to reduce risks	Duly Noted	
Gear Marking		Gear marking should occur everywhere	Proposed Alternatives	Chapter 3
		Work with ME DMF and LMA on gear marking	Proposed Alternatives	Chapter 3
		No exemptions for gear marking	Proposed Alternatives	Chapter 3
Closures and other time/area proposals	**Additional areas to consider**	New Closure in New England	Proposed Alternatives	Chapter 3
		New closure in offshore/deep waters	Proposed Alternatives	Chapter 3
	General	Recommend the approach used in Cape Cod Bay be applied in areas with high chance of human impact (e.g. M/V)	Outside of Scope	
		Create closures based on data on where prey are and can be modified in the future as things change	Proposed Alternatives	Chapter 3
		Micromanaging specific areas sets you up for a big risk	Duly Noted	
Stressors	**Ship strikes**	Ship strikes are the main issue	Outside of Scope, Discussed	Chapter 2, 8
	Noise	Ocean noise are increasing due to navy training, oil and gas exploration, and wind construction and larger transport vessels	Outside of Scope, Discussed	Chapter 8
	Climate change and food	Links between ecosystem changes and reduced reproduction and increase in mortality	Outside of Scope, Discussed	Chapter 2, 8

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
	Other	Dam projects are a threat to food source (copepods), examine this link (e.g. via changing ocean layers)	Duly Noted	
		Sublethal trauma is an issue, impacts health and reproduction	Discussed	Chapter 2, 8
Ecosystem Considerations		Cape Cod area is a non-linear dynamic ecosystem	Duly Noted	
		Consider ecosystem approach to species management and cumulative risk assessment	Duly Noted	
		Changes in the marine food web (consider for critical habitat)	Outside of Scope, Discussed	Chapter 8
		Need to learn something from fishery scientists who are studying the link between cod recruitment and the North Atlantic Oscillation	Outside of Scope	
		Large whales contribute to the health of our ocean ecosystems; the loss of this species will have a cascade of long-lasting and far-reaching effects on nutrient cycling and plankton communities	Duly Noted	
Funding/Subsidies	**Fisherman assistance**	Subsidize cost of ropeless (fed, state, surcharge paid by consumers)	Outside of Scope	
		Convention costs should be completely subsidized, primarily by federal and state governments, but also through a modest 'ropeless surcharge" for lobsters and crabs to be paid by consumers.	Outside of Scope	
Weak Rope	**1700 lbs**	1700 lb should be the upper bound for rope strength. Weak links might not work for whales to break the rope	Analyzed	Chapter 3, 5
		Not a long term solution and Knowlton suggests has to be far less than 1700 to break.	Duly Noted	
	General	Weak rope can be a useful tool to reduce SI/M if tailored to what we know about entanglements	Discussed	Chapter 5
		Weak rope will reduce mortality but not sublethal trauma	Discussed	Chapter 5

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
Economic Concerns		Proposed regulations for lobster fishing in the Gulf of Maine are inappropriate and would impose undue hardship on both our independent fishermen and our small coastal communities	Analyzed	Chapter 6
Coordination with Canada		Given the demonstrated and extreme risks for right whales in Canadian waters on top of numerous deaths associated with Canadian fishing gear, there must be a high level and coordinated working agreement between the US and Canada to protect the species.	Outside of Scope	
Research: Whale and Prey distribution		Whale surveys and plankton tows have been very spotty in Gulf of Maine waters, which hampers NMFS' ability to understand right whale transiting behavior and any spatial and temporal correspondence between the lobster industry in Maine and right whale fitness.	Discussed	Chapter 3
Ropeless		Support ropeless fishing	Discussed	Chapter 3
		LMA3 needs ropeless gear to reduce risks	Rejected Alternatives	Chapter 3
		Allow fishermen to commercially fish with exclusively ropeless fishing gear in areas that are otherwise closed to trap/pot fishing due to the presence of right whales.	Proposed Alternatives	Chapter 3
		Support the development and testing of ropeless gear by providing a gear cache, offering compensation to fishermen involved in testing, and expediting the process to obtain an Experimental Fishing Permit to test ropeless gear.	Outside of Scope	
		Buoyless fishing has to be a win-win and has to be used as a viable long term solution	Duly Noted	
		Phased in approach to ropeless	Discussed	Chapter 3
		Do not consider time tension cutters	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Ropeless is important, encourage light line as a path to ropeless.	Discussed	Chapter 3
		Need to eliminate line/ work with fishermen to accomplish this through things like ropeless fishing	Duly Noted	
		Allow/develop ropeless gear inside and outside of closed areas	Considered	Chapter 3
Decision Support Tool		Recalculate risk reduction in MA LMA1 and OCC. Previous measures should not be accounted for new risk reduction.	Duly Noted	
		Existing data is not predictive of the future	Duly Noted	
		Improve DST	Duly Noted	
Risk Reduction	**Allocation**	Ones found in US likely drowned and are likely US mortalities	Duly Noted	
Other	**Support**	Support recommendations of the TRT	Duly Noted	

Environmental Organizations

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
Exemptions		Remove exemption line	Rejected Alternative	Chapter 3
Safety	**Trawling up**	Trawling up to 30-40 traps in the offshore is a safety issue and not enforceable	Considered	Chapter 5
Line/Effort Reduction	**Trap reduction**	3 trap reduction	Outside of Scope	
		25% trap reduction	Outside of Scope	
		Trawling up within the exemption line isn't likely to do much	Duly Noted	
		Reduce vertical lines through trap reduction	Outside of Scope	
		Analyze alternatives requiring a minimum 25 percent trap reduction for both state and federal permit holders eligible to fish in LMA1, increased as necessary such that when combined with LMA 1 area closures the total risk reduction in LMA1 entanglement risk reduction is 80 percent or greater;	Outside of Scope	
	Line reduction	Support vertical line reduction in Maine waters	Duly Noted	
		Cap the number of vertical lines in all U.S. fixed-gear fisheries subject to the TRP	Proposed Alternatives	Chapter 3
		Significantly reduce the number of vertical lines in the water that entangle right whales.	Proposed Alternatives	Chapter 3
		A requirement to use no more than one endline in Lobster Management Area 3 ("LMA3") year-round	Rejected Alternative	Chapter 3
Monitoring	**Fishery**	Require all federal permits reporting fishing areas in 10 min squares by 2020	Discussed	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Require real-time vessel monitoring and trip reporting in all state and federal waters for the American lobster and Jonah crab fisheries	Considered	Chapter 3
		Better spatial information, including VMS and AIS use in fishery (e.g. 100% VMS/eReporting)	Rejected Alternative	Chapter 3
		Require fishery monitoring and reporting	Discussed	Chapter 3
		A requirement for all vessels in U.S. fixed gear fisheries to use Vessel Monitoring Systems (“VMS”) and electronic Vessel Trip Reporting (“VTR”);	Rejected Alternative	Chapter 3
	Regs	Develop categorization for monitoring and deciding when the trt will need to come back to the table	Duly Noted	
		Review and revise time/area closures annually based on sightings within 3 years.	Considered	Chapter 3
		EIS should have criteria to dissolve static management regulations, change based on surveys	Duly Noted	
		Adjust closures 3-5 years after implemented based on sightings and surveys	Discussed	Chapter 3
		Sustained scientific research in the Gulf of Maine and other New England waters is recommended to continue monitoring the status of the North Atlantic right whale population and determine changes in their spatial and temporal distribution resulting from climate change	Discussed	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Time-area closures should be reviewed annually to adaptively manage for future distribution shifts. The closure could be lifted if best available scientific information demonstrates that right whales are no longer using the area to the same extent.	Considered	Chapter 3
Enforcement		Prioritize and increase enforcement efforts related to NARW protections in state and federal waters.	Discussed	Chapter 3
Gear Marking		Mark gear within the exemption area	Proposed Alternatives	Chapter 3
		Gear marking, if implemented, should be used across all fisheries off the east coast of both the United States and Canada.	Outside of Scope	
		Ideally gear should be identifiable down to the individual operator	Rejected Alternatives	Chapter 3
		Gear marking solutions that take advantage of new smart technologies	Proposed Alternatives	Chapter 3
		Identifying gear associated with an entanglement should be mandated so that useful data will be documented and reported.	Duly Noted	
		Expand gear marking to all US fisheries	Outside of Scope	
		Gear marking every 40 feet (reflecting location, fishery, country, even sub region/ individual if possible)	Rejected Alternatives	Chapter 3
		Require regional gear markings every 40 feet of line for all fixed-gear fisheries along the U.S. East Coast in state and federal waters.	Rejected Alternatives	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Require new gear markings (in all fisheries, including the currently exempt areas that comprise 70 percent of Maine's waters) on all fishing gear every 40 feet so that gear can be traced back to a specific fishery, area fished, and country.	Rejected Alternatives	Chapter 3
		It is essential that all fishing gear, without exception, be thoroughly, and comprehensively marked so as to clearly indicate the specific fishery, and specific area fished	Outside of Scope	
Closures and other time/area proposals	**S. of Nantucket and Martha's Vineyard**	Analyze alternatives and propose a preferred alternative to create a vertical line trap and pot fishing closure in the high whale density area south of Martha's Vineyard and Nantucket (portions of LMA2 and LMA3);	Proposed Alternatives	Chapter 3
		Increased importance of the waters south of Nantucket and Martha's Vineyard, especially in the winter and spring, we urge NMFS to propose and analyze a new fishing closure in this area as part of the preferred alternative in its EIS. We recommend that the boundaries of the closure reflect the highest relative density of right whales	Proposed Alternatives	Chapter 3
		Offshore area closures in south of Martha's Vineyard and Nantucket	Proposed Alternatives	Chapter 3
		A new seasonal protected area south of Martha's Vineyard and Nantucket that allows and incentivizes ropeless fishing	Proposed Alternatives	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Take emergency action to establish an interim closure to all vertical line trap/pot fishing in the high whale density area south of Martha's Vineyard and Nantucket (portions of Lobster Management Areas 2 and 3 (LMA2 and LMA3), effective until rulemaking is completed and permanent measures are implemented.	Rejected Alternatives	Chapter 3
		Implement seasonal restriction south of Nantucket, bounded by those 30-minute squares that capture 80% of the most recent (defined as the last three years) of right whale sightings (Dec-May) and passive acoustic data.	Rejected Alternatives	Chapter 3
		Propose a seasonal protected area south of Nantucket as a preferred alternative in the forthcoming Draft Environmental Impact Statement	Proposed Alternatives	Chapter 3
	Additional areas to consider	In addition, we recommend that NMFS evaluate the potential for new fishing closures in the offshore areas of the Gulf of Maine (i.e., offshore areas of Lobster Management Area 1) and Lobster Management Area 3 as part of its preferred alternative. Arguably, the most severe entanglements originating in the U.S. occur in the offshore fishery, due to the use of more durable vertical line that is comparatively more likely to contribute to serious injury and mortality	Proposed Alternatives	Chapter 3
		Take emergency action to establish an interim closure to vertical line trap/pot fishing during the summer and fall in offshore waters East of Maine in LMA1 and LMA3.	Rejected Alternatives	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Closures during the summer (June, July, August) and fall (Sept./Oct.) in offshore waters South and East of the Maine coast in LMA1 and LMA3.	Rejected Alternatives	Chapter 3
		Analyze alternatives and propose preferred alternatives creating vertical line trap/pot fishing closures during the summer and fall in offshore waters East of Maine in LMA1 and LMA3. NMFS should analyze a range of vertical line closure alternatives between the exemption line extending to the Hague line, and a range of alternatives in the western Gulf of Maine where plankton research shows potential feeding areas.	Considered, Rejected Alternatives	Chapter 3
		Consider proposing additional protected areas in Lobster Management Area 3 ("LMA3") in its DEIS	Proposed Alternatives	Chapter 3
		Closed area in LMA 3 (trap/pot and perhaps gillnet)	Proposed Alternatives	Chapter 3
		Consider closures offshore LMA 1 off Maine	Proposed Alternatives	Chapter 3
		Consider protected areas in Gulf of Maine	Proposed Alternatives	Chapter 3
		Extension of Cape Cod closure to New Hampshire border	Rejected Alternatives	Chapter 3
		A temporal and spatial expansion of the current Massachusetts Restricted Area that allows and incentivizes ropeless fishing (with the exception of inside Cape Cod Bay);	Rejected Alternatives	Chapter 3
		Consider other offshore (e.g. Jordan Basin, MD Rock, and Jeffry's Ledge)	Proposed Alternatives	Chapter 3
	General	Establish new seasonal or year-round fishing closures to protect North Atlantic right whales where they are congregating.	Proposed Alternatives	Chapter 3

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Range of alternatives for dynamic management areas that change based on whale aggregations/ co-occurrence	Discussed	Chapter 3
		Consider all time area management proposals provided last fall by Oceana	Rejected Alternatives	Chapter 3
		Evaluate closed areas with updated data in the DST: whales most common/heaviest gear	Duly Noted	
		Dynamic closures should be considered given increase in unpredictability	Rejected Alternatives	Chapter 3
Stressors	**Ship strikes**	Mandatory speed restrictions (if not everywhere, then in particular areas/closures)	Outside of Scope, Discussed	Chapter 8
		Deal with threats such as ship strikes	Outside of Scope, Discussed	Chapter 8
	Noise	NMFS must also deal with threats such as ship strikes and all forms of pollution, including noise pollution	Outside of Scope, Discussed	Chapter 8
	Climate change and food	Climate change is already having an impact on the ecosystem and contributing to extinctions	Outside of Scope, Discussed	Chapter 8
	Other	Consider existing UME and reduced reproductive success	Discussed	Chapter 2, 8
		Entanglement also impacts their health and reproduction	Discussed	Chapter 2, 4, 8
		Understand the suffering of entangled individuals	Duly Noted	
Ecosystem Considerations		Whales are keystone species, important for ecosystem function and maintaining productive fisheries (e.g. nutrient enrichment)	Duly Noted	
		Consider ecosystem changes	Outside of Scope, Discussed	Chapter 8
Funding/Subsidies	**Fishermen assistance**	NOAA should subsidize ropeless	Outside of Scope	
		NOAA should fund and help make the transition to ropeless, starting in closed areas.	Outside of Scope	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		NMFS and other federal agencies as well as state government should financially assist fishers, through subsidies and other means, in making the changes that are necessary	Outside of Scope	
	Gear innovation funding	Funding for gear research, technology	Outside of Scope	
	Other	Additional and sustained federally funded scientific research in the Gulf of Maine and other New England waters is recommended to continue monitoring the status of the North Atlantic right whale population and determine changes in their spatial and temporal distribution resulting from climate change.	Outside of Scope	
	(incl whale)	Remind NMFS of long-term funding for RW recovery	Outside of Scope	
Weak Rope	**1700 lbs**	The use of the 1,700-lb breaking strength benchmark for reduced breaking-strength (RBS) rope, which may not reduce entanglements of juvenile right whales and may still negatively impact adult survival	Duly Noted	
	General	Weak rope may add line, particularly in Maine where there are snagging concerns with rocky bottoms.	Discussed	Chapter 5
		Concerns about the ability of weak rope to meet ESA needs even if it meets MMPA (address in EIS)	Discussed	Chapter 5
		Weak rope is not a sufficient change for calves, should not be the main part of the proposed rule	Duly Noted	
		Concern that weak rope will add line to the water, increase lost gear	Discussed	Chapter 5
		Weak rope may not be enforceable	Duly Noted	
		Decreasing breaking strength is important	Analyzed	Chapter 5

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Weak rope won't prevent entanglement	Duly Noted	
		Capping rope diameters should not be considered a solution without also reducing rope strength to 1700 lb. (771.1 kg)	Discussed	Chapter 3
		Gear modifications to reduce the breaking strength of vertical ropes so that entangled whales could more easily break free are also important	Proposed Alternatives	Chapter 3
Economic Concerns		Consider people's economic concerns	Analyzed	Chapter 6
		Trap reduction of 25% should not have economic impact since catch has declined	Outside of Scope	
		Evaluate technology based solutions, while supporting coexisting economy	Duly Noted	
		High catch per unit effort an important goal: minimize effect of gear and maximize profits (explore EIS)	Duly Noted	
		Operational challenges of the fishers' down time and cost must be addressed within the Plan and DEIS	Analyzed	Chapter 6
Coordination with Canada		Recommend NMFS at minimum continue its support of Canada's right whale protection efforts	Discussed	Chapter 3
		Work with colleagues in Canada to ensure solutions are complementary and effective throughout the biological range of the North Atlantic right whale.	Duly Noted	
		Gear marking, if implemented, should be used across all fisheries off the east coast of both the United States and Canada.	Outside of Scope	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		NMFS and other agencies of the US government should work closely with the Canadian government and fisheries to protect right whales	Duly Noted	
		Increase support for disentanglement efforts in the U.S. and Canada	Duly Noted	
Disentanglement		Increase collaborations to facilitate and prioritize disentanglement actions to include NARW individuals that may be significantly impacted by entanglement over time, even if initial observation of the individual does not reveal it to be suffering from "serious injury".	Duly Noted	
		Increase support for disentanglement efforts in the U.S. and Canada	Outside of Scope	
Research	**Whale distribution**	Increase comprehensive year round aerial, shipboard, and acoustic surveys and monitoring of right whales along the U.S. East Coast (particularly in late summer)	Discussed	Chapter 3
		Recommend NMFS increase survey effort delineate the contemporary late spring, summer, and fall distribution and movements	Discussed	Chapter 3
		It is not currently known if right whales are utilizing a defined biological corridor or if additional foraging habitats are emerging en route to the Gulf of St. Lawrence. We strongly urge NMFS to further investigate the level of risk faced by right whales as they transition from U.S. waters to the Gulf of St. Lawrence to ensure the species is protected.	Duly Noted	
		NMFS should expand right whale surveillance efforts in U.S. waters, particularly in the Gulf of Maine	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		While the temporal and geographic scope of both acoustic and aerial surveys have expanded in recent years, additional efforts off the mid-Atlantic, the coast of Maine, and Nova Scotia should be considered.	Duly Noted	
		Sustained scientific research in the Gulf of Maine and other New England waters is necessary to continue assessing the risk of serious injury and mortality to North Atlantic right whales resulting from entanglements and monitoring the effects of regulatory changes.	Duly Noted	
		Significantly increase year-round aerial and acoustic surveys of right whales in U.S. waters;	Duly Noted	
		NMFS to enhance survey effort and review carcass drift analyses	Duly Noted	
		Need more data on aggregations	Duly Noted	
	Prey distribution	Increase monitoring of NARWs primary prey species, along the northeast Atlantic coast.	Outside of Scope	
		Significantly increase year-round surveys of right whales prey in U.S. waters;	Outside of Scope	
		Analyze plankton data for foraging habitats in the offshore areas of the Gulf of Maine	Outside of Scope	
		increase plankton surveys along the U.S. East Coast;	Outside of Scope	
Ropeless		Ropeless plan - experimental first then commercially viable within 5 years, also in currently closed areas	Rejected Alternatives	Chapter 3
		Remove legal barriers to ropeless, move towards implementation	Discussed	Chapter 3
		Supportive of vertical line reductions through ropeless gear	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Include alternatives that would allow for "ropeless" fishing in new closed areas created through this action and existing closed areas (with the exclusion of Cape Cod Bay), and alternatives that would create incentives and increase development of ropeless technology and experimental fishing with ropeless gear	Proposed Alternatives	Chapter 3
		NMFS should include a "ropeless roadmap" in the EIS, detailing how ropeless fishing systems will be advanced to a point that they are commercially viable, and how they will subsequently be implemented for commercial fishing, both within certain closed areas and elsewhere.	Outside of Scope	
		Ropeless fishing systems are the most effective way to reduce the risk of right whale entanglement—given the complete removal of the vertical line from the water column—while allowing fishing with pot and trap gear	Duly Noted	
		A closure south of Nantucket and Martha's Vineyard could also represent a valuable opportunity to advance the testing of ropeless fishing systems	Duly Noted	
		Include plan in DEIS for developing, testing, and implementing ropeless fishing (closed areas and elsewhere)	Outside of Scope	
		Implement, incentivize, and enforce ropeless fishing requirements by fixed-gear fisheries in key areas that overlap with current and projected NARW movements.	Proposed Alternatives	Chapter 3
Decision Support Tool		Conduct a rigorous, best-practice expert elicitation to assess the risk posed by different gear configurations	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		The density maps currently being used by the agency to assess right whale risk, and the effectiveness of risk reduction measures, do not accurately reflect current levels of right whale habitat use, including in inshore and nearshore areas.	Duly Noted	
		The agency has a significant amount of recent data from state monitoring efforts, passive acoustic monitoring data, opportunistic marine mammal sightings data, and other data sources—that are particularly informative for some of the areas such as south of Nantucket and Martha's Vineyard. All these sources should be used to develop and inform the risk-reduction measures in the EIS.	Duly Noted	
		By not including the sub-lethal effects of entanglements on North Atlantic right whales, the decision support tool likely underestimates the risk of severity from different gear types.	Duly Noted	
		Update and peer review the decision support tool	Considered	Chapter 3
		Immediately validate and update the decision support tool with up-to-date right whale data from all sources i.e. state and federal waters, visual data (sightings), acoustic data	Duly Noted	
		Cannot rely on past data to predict the future	Duly Noted	
Risk reduction	**Allocation**	Representatives of Lobster Management Area (LMA) 3 did not commit to any new risk reduction measures.	Duly Noted	
	Target	NMFS should strive for an 80 percent risk-reduction target	Duly Noted	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		Analyze alternatives for targeted vertical line and trap reductions, in order to reach 80 percent entanglement risk reduction;	Duly Noted	
		Set the target risk reduction in U.S. waters at 80 percent, which is necessary to reach the allowed potential biological removal, and analyze all alternatives and combination of alternatives as to whether they meet this standard.	Duly Noted	
		NMFS must amend the Atlantic Large Whale Take Reduction Plan (ALWTRP) to reduce the risk and severity of entanglements by 80 percent in U.S. waters.	Duly Noted	
		60% risk reduction is not enough for RW recovery, need at least 80%	Duly Noted	
Other	**Support**	NMFS Must Act Immediately with Strong and Targeted Measures to Reduce the Risk of Entanglement to North Atlantic Right Whales	Duly Noted	
		Rules should be focused on co-occurrence of gear and whales.	Analyzed	Chapter 5
		NMFS should implement and enforce the April 2019 take reduction framework to reduce entanglements that cause serious injuries and mortalities to North Atlantic right whales in trap/pot gear in New England.	Discussed	Chapter 3
		Adopt the proposed options that were decided upon at the TRT	Rejected Alternatives	Chapter 3
	General	Request a scoping meeting in coastal Georgia	Outside of Scope	

Topic Area	Sub-category	Specific Comment Component	Category	DEIS Section
		There should be an expansion of geographic scope beyond New England in future rulemakings. North Atlantic right whales are occurring more frequently in mid-Atlantic waters, but the distribution of fixed gear fishing effort in that region is not well understood (and has not been presented at recent TRT meetings).	Outside of Scope	
		Exclusive focus of the current recommended take reduction framework on the US lobster fishery, ignoring the higher relative risk of other US fisheries.	Outside of Scope, Discussed	Chapter 2, 3, 8

Appendix 3.5 ALWTRP Enforcement and Compliance Monitoring Strategy

NOAA's National Marine Fisheries Service
Greater Atlantic Regional Fisheries Office
Protected Resources Division
And
NOAA Office of Law Enforcement - Northeast Division
NOAA Office of General Counsel - Enforcement Section

April 2021

3.5.1 Purpose

The Atlantic Large Whale Take Reduction Plan (ALWTRP) Draft Environmental Impact Statement (DEIS) outlined recommendations provided by Take Reduction Team Members (Table 3.1), which included the development of a monitoring plan to monitor compliance efficacy over time as well as track implementation approaches and innovations. Additionally Section 3.3.6.2 (1) Non-regulatory Components of the DEIS specify the purpose of a compliance monitoring plan to support the proposed regulatory alternatives in the Final Environmental Impact State and ALWTRP rule-making.

3.5.2 Need

This Enforcement and Compliance Monitoring Strategy describes enforcement efforts to inform fishermen of the regulatory requirements to support their ability to comply, as well as through the inspection of gear and associated enforcement actions. In state waters, NMFS supports enforcement related to marine-mammal protection through funding for joint enforcement agreements in all coastal states in the Greater Atlantic Region. NMFS is in the process of developing an offshore-enforcement plan that combines traditional enforcement practices with the use of new technologies to support enforcement throughout the EEZ. The following sections provide summaries for ongoing outreach and enforcement measures within the Northeast Region Trap/Pot Management Area. Additionally, data gaps to inform future enforcement actions are identified and recommendations for the enforceability of proposed measures are discussed.

3.5.3 Summary of Proposed Changes for ALWTRP

- Gear modifications to reduce the number of vertical lines
- Seasonal restricted areas that allow ropeless fishing but would be seasonally closed to fishing with persistent buoy lines
- Gear modifications to include replacement of buoy lines with weak rope or weak insertions placed in intervals in buoy lines
- Additional gear marking and expansion of gear marking requirements throughout the Northeast Region

3.5.4 Enforcement Activities for ALWTRP

Enforcement of the ALWTRP has been an important component of monitoring the effectiveness and compliance of regulatory requirements since the development and implementation of the original plan in 1997. Since 1997, and resulting from amendments to the ALWTRP, law-enforcement activities have evolved to meet the needs of enforcing the various requirements of the ALWTRP and monitoring compliance through collaboration with federal and state agencies. Since the development of the ALWTRP in 1997, the NOAA Office of Law Enforcement has increased its capacity to monitor fisheries in state waters through the implementation of Joint Enforcement Agreements (JEA) with state partners, and coordinated enforcement efforts in federal waters in collaboration with the United States Coast Guard. Primary enforcement activities include dockside gear and catch inspections, at-sea patrols and gear inspections, aerial surveillance and regulatory outreach activities. To implement changes to the ALWTRP, the following law-enforcement activities and priorities have been identified for funding and support by NOAA and collaborating enforcement agencies.

3.5.4.1 Law Enforcement Workforce

Maintaining and enhancing the NOAA Office of Law Enforcement - Northeast Division (OLE-NED) workforce is critical to implement regional enforcement priorities for the ALWTRP. The OLE-NED's current workforce consists of sixteen Special Agents, twelve Uniformed Officers, one Industry Liaison, six Mission Support Staff, and seven Investigative Support Staff members. The OLE-NED workforce conducts investigative activities, patrol activities, regulatory outreach to industry, implements and oversees JEAs, oversees OLE and ALWTRP specific funding and reporting requirements, and other support functions. OLE-NED maintains two 42 ft Metal Shark Patrol Vessels used throughout the region for specialized on-water enforcement activities. The current workforce capacity is estimated to remain at the current level for fiscal years 2021 and 2022.

3.5.4.2 Maintaining Joint Enforcement Agreements

State partnerships serve a significant role in effective regional enforcement activities. OLE-NED has Joint Enforcement Agreements (JEA) in place with ten New England and Mid-Atlantic Coastal States (ME, NH, MA, RI, CT, NY, NJ, DE, MD, and VA). JEAs are implemented beginning in May of each year using OLE programmatic funds. Each state uses OLE provided forms to assess their labor and equipment needs for the next contract year. Labor costs are assigned among six Execution Priorities. The JEAs specify Execution Priority for Protected Resources and Gear Compliance that is largely directed to ALWTRP regulatory requirements. OLE-NED hosts semi-annual meetings with JEA partners to discuss enforcement priorities. Additional meetings may be organized as needed to discuss new enforcement needs and requirements (example: new rule making). States are required to submit monthly reports that detail performance and expended funds. Previous monthly and annual reports demonstrate an average of 12,785 obligated or completed hours have been allocated to state enforcement activities over the past three fiscal years (FY2020, FY2019, and FY2018). This level of effort is expected to be maintained over FY2021 and FY2022, with no significant changes in funding. All ten states have hours assigned to the Protected Resources / Gear priority in their FY2020 and FY2021 agreements. The following states perform inspections of lobster gear in Lobster Management Areas: ME, NH, MA, RI, CT, NY, NJ. The following states perform inspections of black-sea-bass gear in Lobster Management Areas: DE, MD, VA. Common areas of non-compliance documented by state enforcement efforts include gear/buoy marking violations, wet-storage violations, trap-tag violations, and trap configurations. These areas, coupled with industry outreach, will continue to be a priority for compliance monitoring by state partners.

3.5.4.3 Enhancement of Offshore Enforcement Capabilities

Challenges with traditional methods of hauling gear in offshore environments for compliance monitoring continues to be a concern regarding safety and the sustainability of these types of operations. These identified challenges require alternative methods to be identified that can be implemented efficiently with desired operational capabilities. Therefore, OLE-NED has developed and implemented a pilot program using remotely operated vehicles (ROVs) to inspect offshore fishing gear. OLE-NED has conducted two offshore, subsurface survey operations using an ROV to check for sinking ground lines, markings, and weak links in an area previously uninspected. Gear tags were also inspected when possible. As a result of initial trials, OLE has assessed that *in situ* inspection of gear in the water by ROVs rather than physically pulling the gear is still the safest and most viable approach to efficiently and effectively enforce offshore lobster gear requirements. The pilot project is being carried out in FY2020 and FY2021 and will inform future offshore enforcement activities for ALWTRP compliance monitoring efforts.

OLE will continue its close partnership with the United States Coast Guard (USCG) to conduct ALWTRP enforcement activities in offshore waters. OLE-NED and USCG meet routinely to discuss joint enforcement priorities and identify gear and areas for targeted patrols regulated by the ALWTRP. The USCG conducts regular at-sea gear inspections. Failure to comply with marking and weak-link requirements are the two most common areas of non-compliance the USCG has documented in the past three years. These areas will continue to be a high priority for ALWTRP enforcement efforts.

3.5.4.4 Industry Outreach Efforts

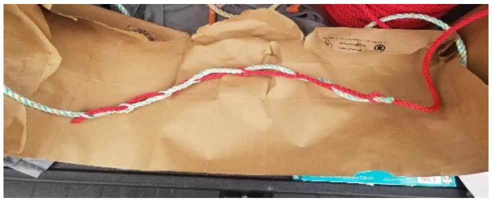
NOAA OLE and protected species program staff at the NOAA Greater Atlantic Regional Fisheries Office and the Northeast Fisheries Science Center, as well as state partners under the JEA perform routine outreach efforts to industry to provide information regarding regulatory requirements. Execution Priorities for JEA activities include industry outreach. Outreach activities have been substantially impacted in FY2020 and FY2021 and it is anticipated these impacts will continue throughout the remainder of the 2021 JEA contract year.

3.5.4.5 Other Compliance Monitoring Activities

Although operational enforcement activities are critical in the enforcement of the ALWTRP, additional needs have been identified to assist in planning and compliance monitoring efforts. Specific data needs to inform enforcement priorities, understanding baselines for fishing gear in certain areas, and identifying areas of non-compliance are as important in implementing a comprehensive enforcement strategy. OLE-NED will work with protected-species biologists, fisheries managers, state partners and the USCG to review existing data and current data collection protocols for enforcement activities. Other areas, such as upcoming electronic vessel trip reporting requirements and the potential, future collection of higher resolution spatial data through vessel tracking systems will be explored for enhancing enforcement capabilities to monitor fishing activity on a spatial scale. NMFS intends to work with the Atlantic States Marine Fisheries Commission, through their open and public process, to develop additional high resolution spatial data collection objectives and requirements, while balancing the financial burden to industry. Spatial data collection protocols and processes will be reviewed for potential incorporation into enforcement planning initiatives. A data-review process will help inform adaptive management strategies and in the development of specific performance measures for the enforcement program. Annual reviews of ALWTRP enforcement activities will be conducted with the intent to inform enforcement planning strategies among OLE-NED, JEA partners, andthe USCG. Additionally, these efforts will assist in identifying specific areas for targeted outreach activities to maximize law-enforcement resources and effectiveness.

Appendix 3.6 Example of approved weak insert gear configurations

The median breaking strength (in pounds) of 8 weak contrivances tested at least 10 times on calibrated breaking machine; all broke with clean ends. General note: strength of inserts is never higher than the strength of the rope in the insert. The butt splice connection appears to create breaking strength equal to strength of insertion rope, in these cases, MA red and candy cane rope.

Rope 1	Rope used for weak insertion	Weak insertion method	Median Strength	Photos
Hydropro on both ends of insert Everson on both ends	MA weak red Candy cane	4 tuck splice	1698.5 1764	
Hydropro on both ends of insert	MA weak red	3 tuck splice	1610.5	

Rope 1	**Rope used for weak insertion**	**Weak insertion method**	**Median Strength**	**Photos**
Hydropro on both ends of insert Everson	MA weak red Bonded candy cane	Eye to loop splice/3 tucks	1668 1700	
Hydropro on both ends Everson	MA weak red Bonded candy cane	Butt splice	1710.5 1831	
Annaco on both ends	Sleeve: finishing treatment such as heat shrinking, tape or hog rings on ends, does not impact breaking strength	South Shore Sleeve	1657	 Heat shrink and hog rings in this image

CHAPTER 4 APPENDICES

Appendix 4.1 Full List of Species Caught Using Trap/Pot Gear* in the Northeast** in 2019

Species Name	Landing Pounds	Landing Value ($)
LOBSTER, AMERICAN	123,600,000	615,400,000
CRAB, JONAH	13,275,373	10,894,878
CRAB, RED DEEPSEA	3,682,739	3,682,739
CRAB, ATLANTIC ROCK	2,026,960	1,110,885
HAGFISHES	1,964,864	2,223,046
SCUP	629,323	448,495
WHELK, CHANNELED	491,960	5,472,321
BASS, BLACK SEA	268,929	868,456
CONCHS	126,593	462,132
CRAB, GREEN	83,145	41,651
MENHADENS	36,780	55,543
CRABS, BRACHYURA	27,228	17,959
FLOUNDER, SUMMER	26,980	103,918
SHARK, DOGFISH, SPINY	22,453	103,652
MACKEREL, ATLANTIC	18,059	9,748
CRAB, HORSESHOE	13,423	9,666
WHELK, KNOBBED	12,708	67,534
EEL, CONGER	10,461	8,311
EEL, AMERICAN	10,239	26,743
TAUTOG	9,035	33,489
WHELK, WAVED	6,612	5,525
HAKE, RED	5,637	2,190
HAKE, SILVER	5,158	3,829
BLUEFISH	5,131	4,347
CUNNER	4,322	9,147
SKATE, LITTLE	4,100	533
GOOSEFISH	2,744	4,187
TRIGGERFISHES	2,232	3,599
BASS, STRIPED	2,128	10,339
HERRING, ATLANTIC	2,000	860
SCALLOP, SEA	1,689	16,853
HADDOCK	1,570	1,976
COD, ATLANTIC	1,416	3,017
CRABS, SPIDER	1,261	1,057
SKATE, WINTER	1,211	533
POLLOCK	888	1,289

Species Name	Landing Pounds	Landing Value ($)
SQUID, LONGFIN LOLIGO	856	1,292
BUTTERFISH	802	548
CLAM, QUAHOG, NORTHERN	750	8,963
OYSTER, EASTERN	557	19,212
TUNA, LITTLE TUNNY	523	379
HAKE, WHITE	500	758
RAVEN, SEA	433	650
SEAROBINS	417	54
SHAD, HICKORY	355	213
SCALLOP, BAY	349	3,446
PERCH, WHITE	275	286
SKATES, RAJIDAE (FAMILY)	268	1,265
WEAKFISH	206	276
FLOUNDER, WINTER	140	396
HALIBUT, ATLANTIC	127	817
CRAB, NORTHERN STONE	117	99
BONITO, ATLANTIC	95	214
FLOUNDER, WITCH	92	217
GOOSEFISH, BLACKFIN	89	267
FLOUNDER, AMERICAN PLAICE	87	161
TOADFISHES, BATRACHOIDIDAE (FAMILY)	81	242
CLAM, RAZOR, ATLANTIC	78	1,129
CRAB, BLUE	57	342
FLOUNDER, YELLOWTAIL	36	67
CUSK	33	18
MACKEREL, SPANISH	15	15
SHARK, DOGFISH, SMOOTH	14	11
KILLIFISHES	12	60
MUMMICHOG	12	70
CATFISHES, BULLHEAD	12	21
DRUMS	6	2
CLAM, SOFT	6	87
WINDOWPANE	5	1
KINGFISHES	2	1
KINGFISH, NORTHERN	2	1
SHRIMP, NORTHERN	1	3
REDFISH, ACADIAN	1	1
Total	146,392,761	641,152,025

Notes: *data include all trap/pot gears
**data cover states from Maine to Connecticut
Data source: ACCSP Confidential Data Warehouse, 2021

Appendix 4.2 Social Indicators for Top Landing Ports of American Lobsters by State

State	Port	County	Pounds	Port Share	Value	Poverty	Labor Force	Housing Characteristics	Population Composition	Personal Disruption	Housing Disruption	Retiree Migration	Urban Sprawl	Commercial Engagement	Commercial Reliance
ME	Stonington	Hancock	15,152,984	12%	$57,674,407	0.155	0.281	0.846	-0.846	-0.058	1.489	0.149	-1.516	4.446	4.554
	Vinalhaven	Knox	8,916,960	7%	$39,207,878	-0.651	0.028	0.849	-1.171	-0.601	0.932	0.23	-1.341	2.635	2.622
	Beals	Washington	6,955,382	6%	$21,700,970	-0.446	0.91	N/A	-1.121	-0.372	0.298	0.357	-2.427	2.11	5.706
	Friendship	Knox	5,027,178	4%	$23,596,699	-0.182	0.201	0.392	-0.813	-0.473	-0.427	0.579	-1.118	1.725	1.663
	Portland	Cumberland	3,987,340	3%	$18,409,293	0.665	-0.99	0.349	-0.316	-0.088	0.583	-1.005	0.121	5.205	-0.031
	Spruce Head	Knox	3,960,384	3%	$15,914,903	-0.958	-0.27	0.481	-1.043	-0.734	-0.223	0.789	-1.084	3.333	1.287
	Jonesport	Washington	3,292,579	3%	$9,967,077	-0.111	1.103	1.249	-0.839	0.099	-0.025	0.7	-2.463	1.82	1.538
	Milbridge	Washington	2,845,255	2%	$10,081,280	-0.225	0.875	1.121	-0.475	-0.01	1.028	0.605	-2.272	1.227	0.786
	Cundys Harbor	Cumberland	2,836,017	2%	$12,108,318	-0.347	0.722	0.205	-1.166	-0.8	0.999	0.998	-0.348	3.657	0.665
	Owls Head	Knox	2,768,925	2%	$11,979,699	0.082	0.349	0.28	-0.79	-0.594	0.106	0.704	-1.196	1.084	0.69
	State Total		121,344,936	46%											
NH	Newington	Rockingham	4233958	70%	26463533.15	-0.775	-0.56	-0.705	-0.742	-0.841	0.607	-0.153	0.091	1.91	2.351
	Portsmouth	Rockingham	1344288.8	22%	6322403.26	-0.729	-0.9	0.072	-0.745	-0.677	0.631	-0.662	0.289	1.361	-0.058
	Seabrook	Rockingham	316024.28	5%	1469528.63	-0.365	-0.2	0.823	-0.851	0.089	-0.611	0.021	0.298	0.644	-0.041
	State Total		6,082,882	97%											
MA	Gloucester	Essex	4,148,414	23%	$21,150,942	-0.352	-0.12	0.018	-0.71	-0.314	0.211	-0.003	0.391	10.57	0.23
	New Bedford	Bristol	2,021,644	11%	$11,667,249	1.227	-0.18	0.5	0.743	0.877	0.314	-0.46	0.68	32.888	0.23
	Rockport	Essex	1,362,018	8%	$6,559,445	-0.641	0.057	-0.039	-0.886	-0.787	-0.267	0.404	0.484	0.908	0.016
	Marshfield	Plymouth	867,973	5%	$3,855,943	-0.497	-0.71	-0.592	-0.692	-0.637	0.223	-0.392	0.414	1.299	-0.072
	Provincetown	Barnstable	840,502	5%	$4,663,832	-0.341	0.075	0.116	-0.665	0.066	1.382	0.341	0.496	0.965	0.279
	State Total		17,690,692	52%											
RI	Point Judith	Washington	950,699	50%	$5,370,662	-0.861	0.092	-0.178	-0.976	-0.459	0.933	0.093	-0.063	9.854	0.495
	Newport	Newport	794,620	42%	$4,731,121	-0.004	-0.65	0.006	-0.36	-0.33	1.005	-0.71	0.255	1.425	-0.06
	Little Compton	Newport	126,892	7%	$674,959	-0.386	0.054	-0.278	-0.913	-0.574	0.938	0.192	0.042	0.474	0.05
	State Total		1,905,689	98%											

Appendix 4.3 Definition of Social Indicators

Indices	Type	Description
Social Vulnerability Indices	Poverty	A commonly used indicator of vulnerable populations. A high rank indicates a high rate of poverty and a more vulnerable population
	Labor Force	Characterizes the strength and stability of the labor force and employment opportunities that may exist. A high rank means likely fewer employment opportunities and a more vulnerable population
	Housing Characteristics	A measure of infrastructure vulnerability and includes factors that indicate housing that may be vulnerable to coastal hazards. A high rank means a more vulnerable infrastructure and a more vulnerable population. On the other hand, the opposite interpretation might be that more affordable housing could be less vulnerability for some populations
	Population Composition	Shows the presence of populations who are traditionally considered more vulnerable due to circumstances often associated with low incomes and fewer resources. A high rank indicates a more vulnerable population
	Personal Disruption	Represents factors that disrupt a community member's ability to respond to change because of personal circumstances affecting family life or educational levels or propensity to be affected by poverty. A high rank indicates more personal disruption and a more vulnerable population
Gentrification Pressure Indices	Housing Disruption	Represents factors that indicate a fluctuating housing market where some displacement may occur due to rising home values and rents. A high rank means more vulnerability for those in need of affordable housing and a population more vulnerable to gentrification
	Retiree Migration	Characterizes areas with a higher concentration of retirees and elderly people in the population. A high rank indicates a population more vulnerable to gentrification as retirees seek out the amenities of coastal living
	Urban Sprawl	Describes areas experiencing gentrification through increasing population and higher costs of living. A high rank indicates a population more vulnerable to gentrification
Fishing Engagement and Reliance Indices	Commercial Engagement	Measures the presence of commercial fishing through fishing activity as shown through permits and vessel landings. A high rank indicates more engagement
	Commercial Reliance	Measures the presence of commercial fishing in relation to the population of a community through fishing activity. A high rank indicates more reliance

Appendix 4.4 Community Profiles

Stonington, ME

Where is Stonington located?

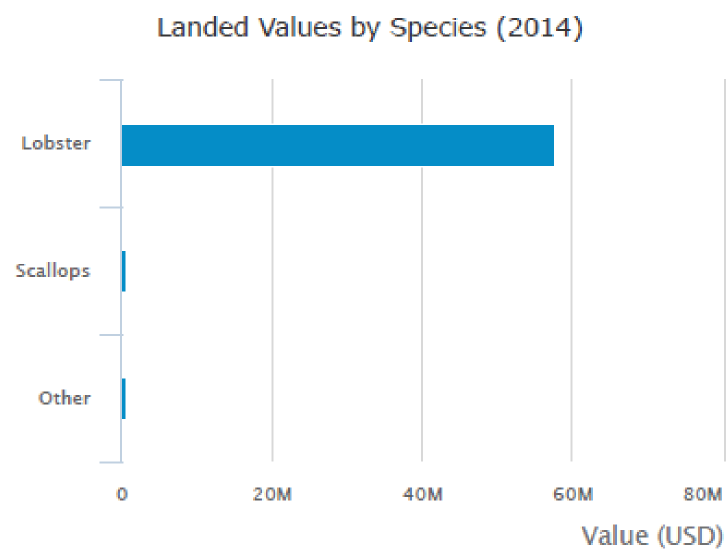
Stonington is a town with a population of 1,043 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

Involvement in Fisheries

What species are landed in Stonington?

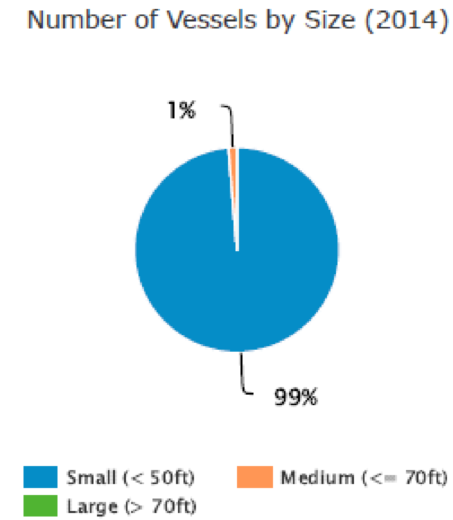
The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Stonington?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoresic industries) available in a given location.



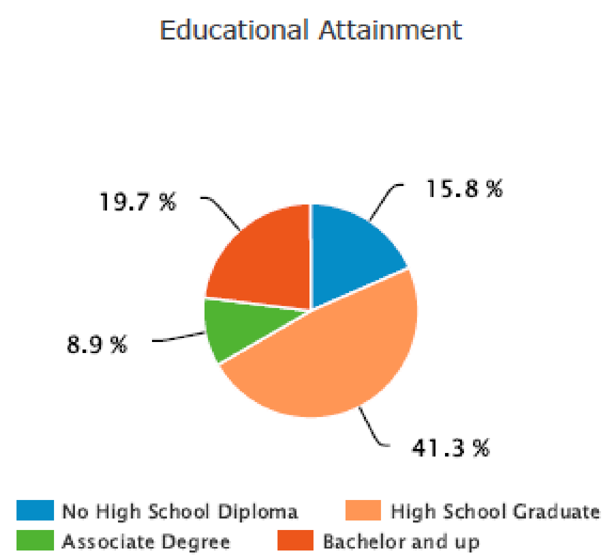
Size also matters. Larger vessels can travel farther offsl and stay out for longer periods more easily than smalle vessels. These differences also affect family life. Small dayboat fishermen tend to return home every day wher fishermen on larger vessels may be away from home fo weeks on long and distant

Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

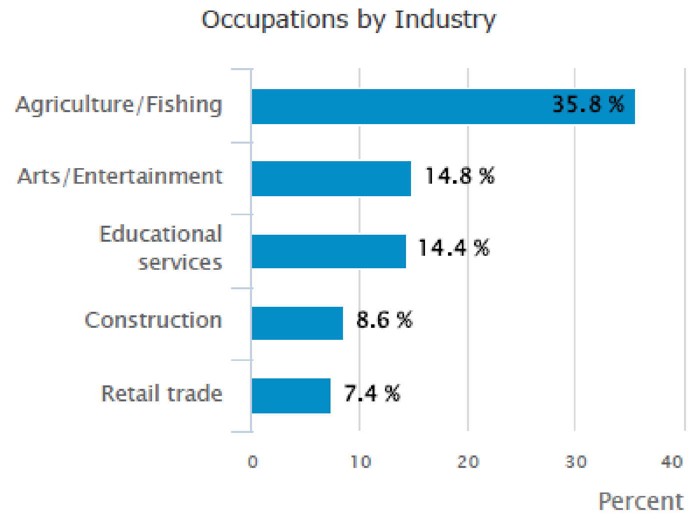
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Stonington?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **2%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: **$36,339.00**

National Average: **$51,914.00** (2011)

Individuals in Stonington living in poverty: **10.4%** The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

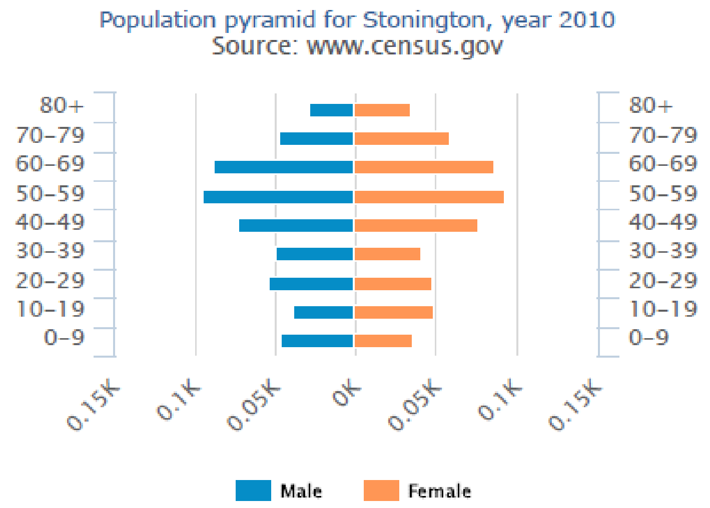
Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

may indicate the presence of universities or a military base.

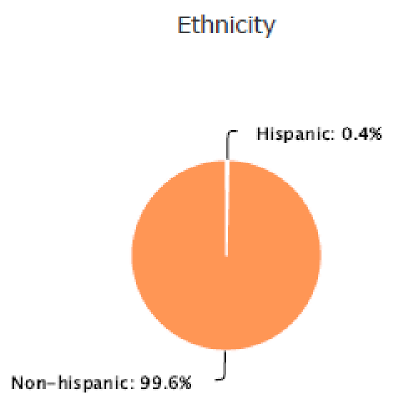
Median age: **50.7**

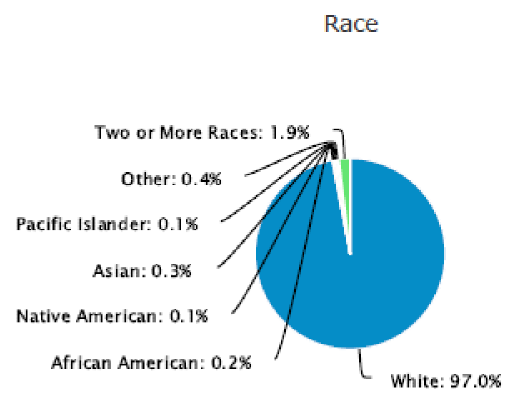
National median: **37.2**



Ethnicity and Race

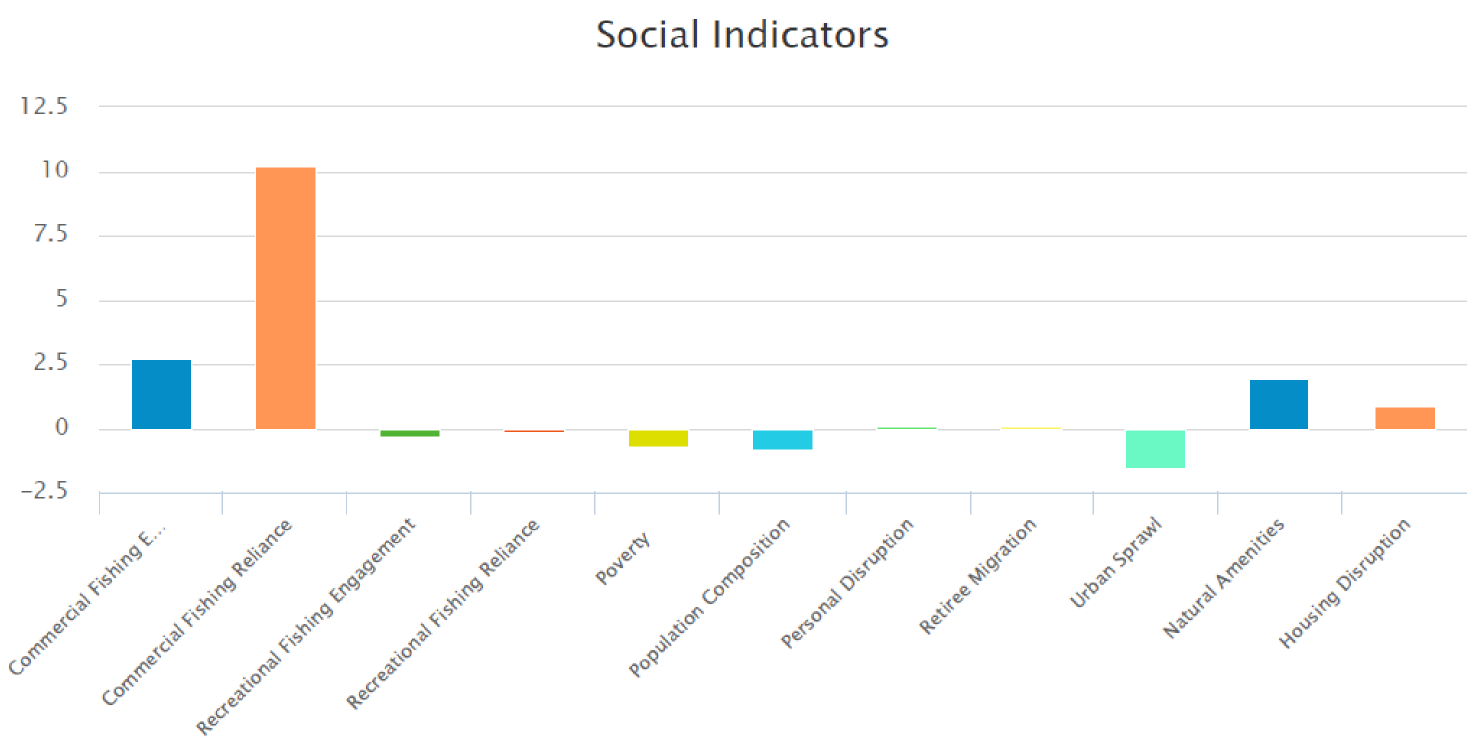
These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region





Language and Marginalization

Foreign Born: **2.1%**



[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

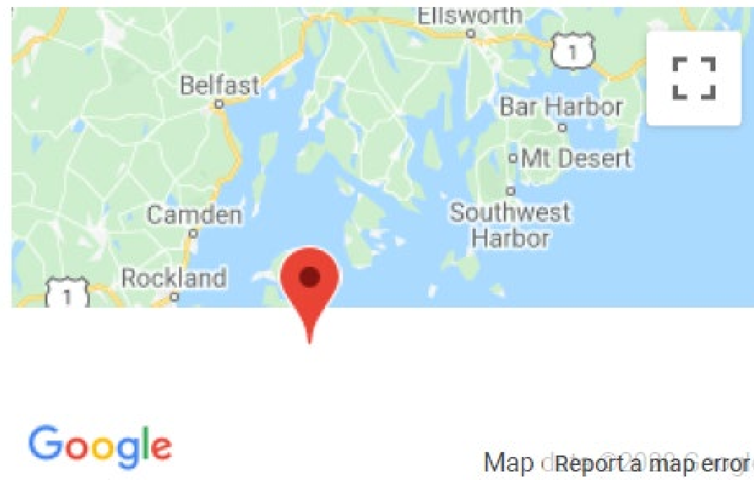
[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Vinalhaven, ME

Where is Vinalhaven located?

Vinalhaven is a town with a population of 1,165 and classified by the census as falling within a rural area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers.

However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]



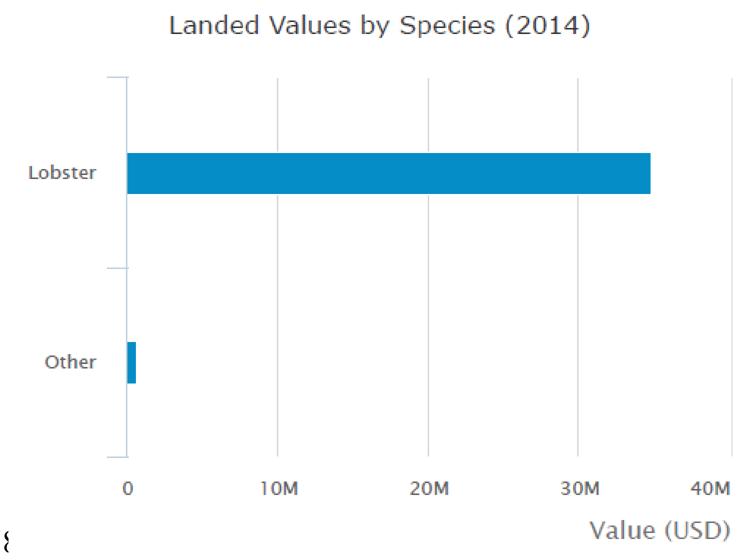
Involvement in Fisheries

What species are landed in Vinalhaven?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

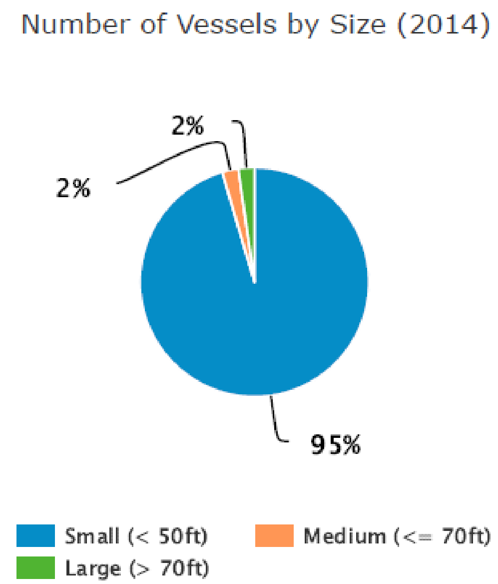
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Vinalhaven?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.

Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

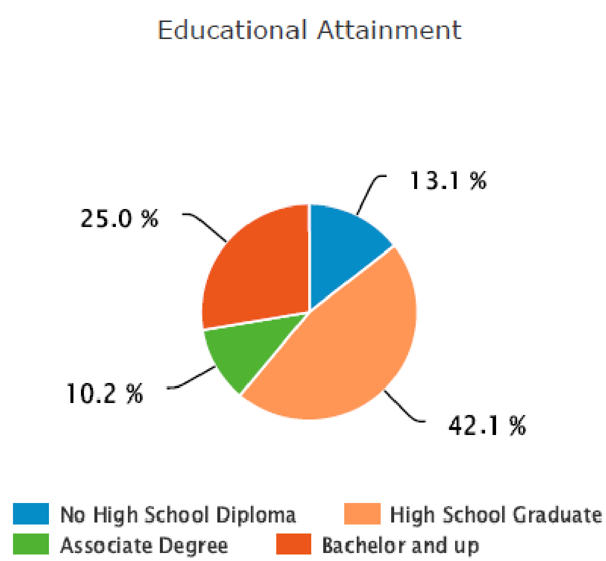


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

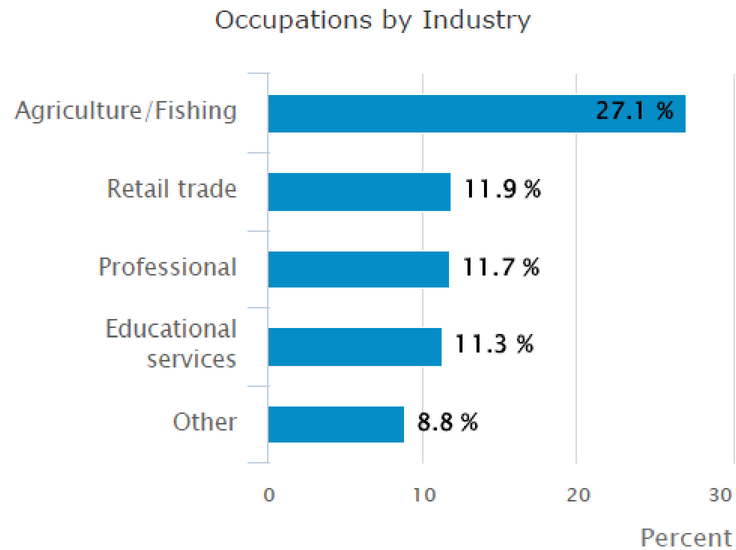
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Vinalhaven?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **1.2%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: **$40,526.00**

National Average: **$51,914.00** (2011)

Individuals in Vinalhaven living in poverty: **16%**

The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

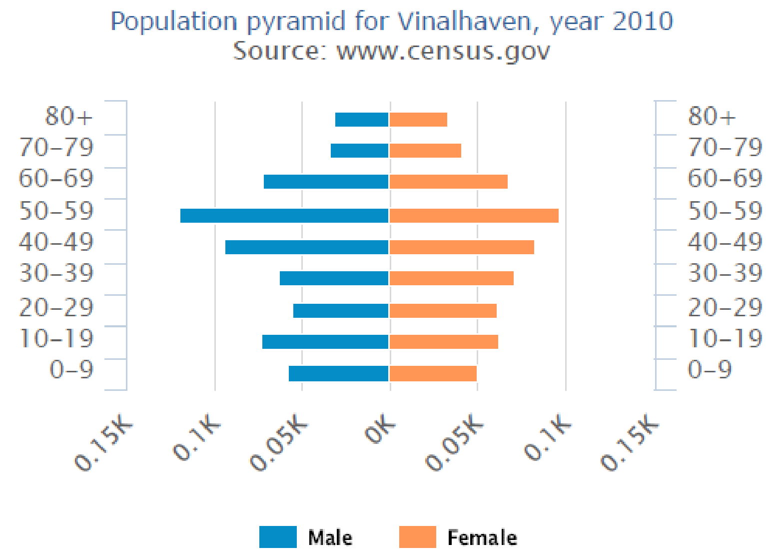
Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

may indicate the presence of universities or a military base.

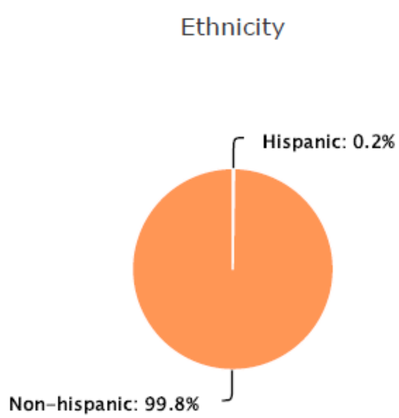
Median age: **45.1**

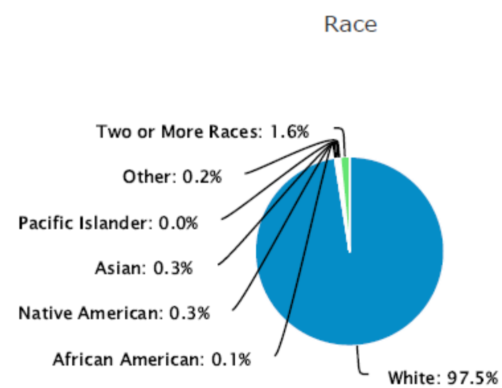
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **.9%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Stonington they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **.5%**

National Average: **8.7%**

Social Indicators

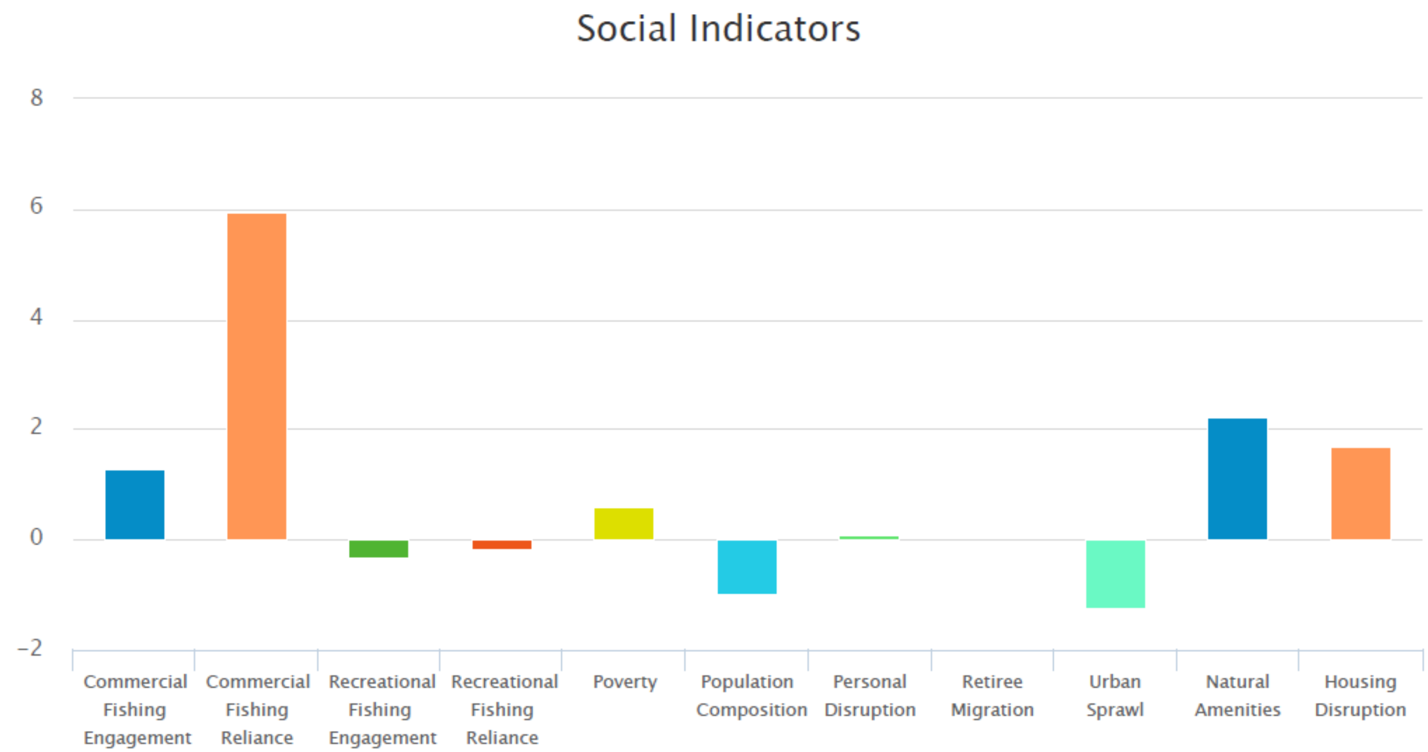
Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Stonington that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

Fishing engagement and reliance indices portray the importance or level of dependence of commercial or recreational fishing to coastal communities. The indices include: Commercial Engagement, Commercial Reliance, Recreational Engagement and Recreational Reliance.

Social vulnerability indices represent social factors that can shape either an individual or community's ability to adapt to change. These factors exist within all communities regardless of the importance of fishing. The indices include: Poverty, Population Composition, and Personal Disruption.

Gentrification Pressure indices characterize those factors that, over time may indicate a threat to the viability of a commercial or recreational working waterfront, including infrastructure. The indices include: Retire Migration, Urban Sprawl, Natural Amenities and Housing Disruption.

The factor scores for each index are normalized so that zero is the mean. Therefore, a higher value implies more engagement or reliance upon fishing or higher social vulnerability or vulnerability to gentrification. Learn more about the
social indicators for fishing communities.



[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Beals, ME

Where is Beals located?

Beals is a town with a population of 508 and classified by the census as falling within a rural area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

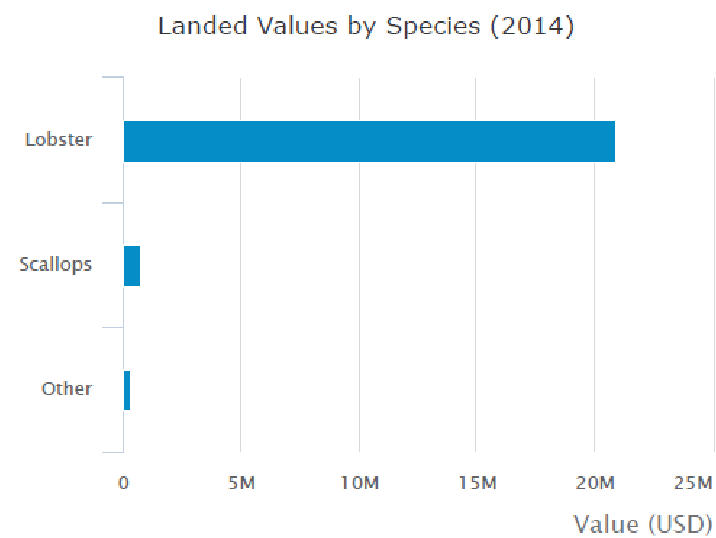
Involvement in Fisheries

What species are landed in Beals?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

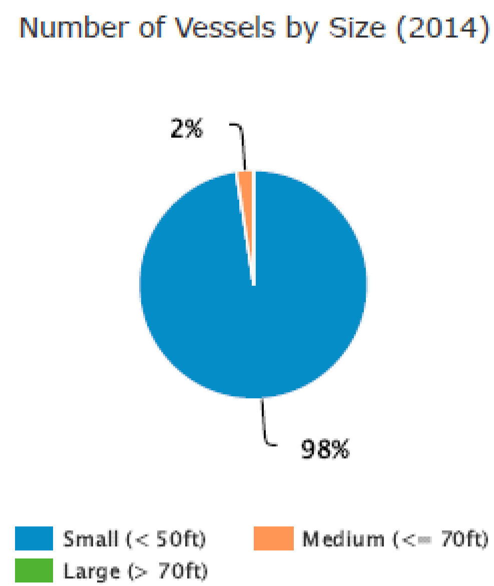
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Beals?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.

Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

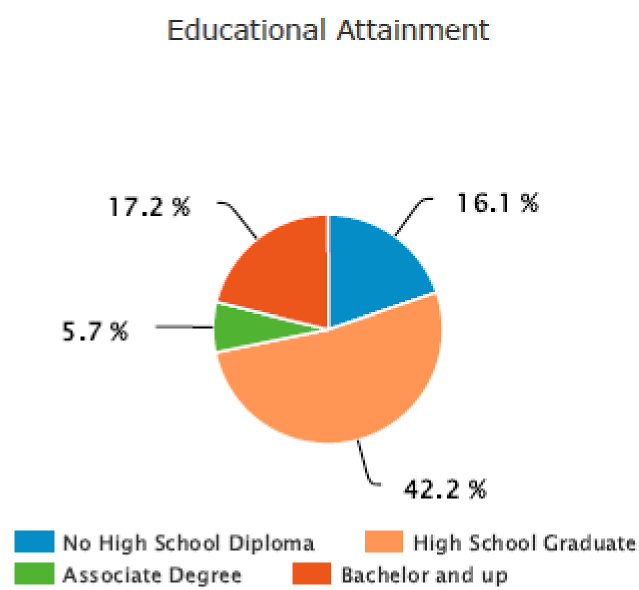


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the

Demographic Attributes

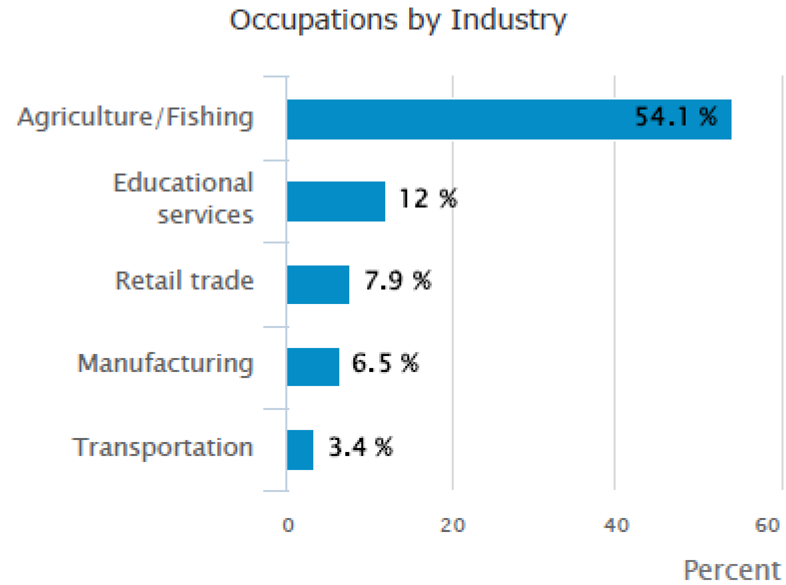
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Beals?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **4.1%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: **$32,500.00**

National Average: **$51,914.00** (2011)

Individuals in Beals living in poverty: **16.8%**

The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town’s population living under this economic threshold is an indicator of the residents’ ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

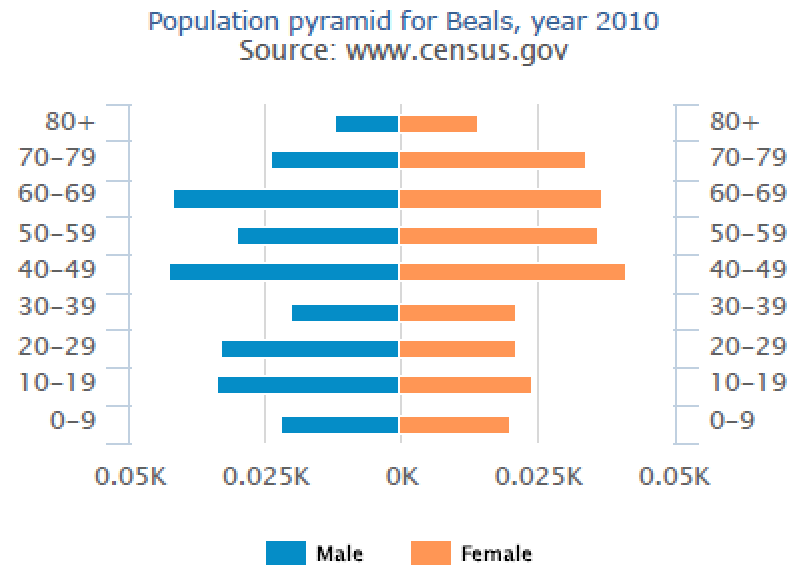
Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen’s access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

may indicate the presence of universities or a military base.

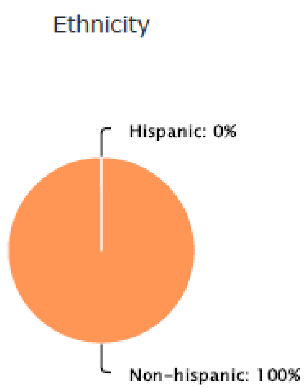
Median age: **48.1**

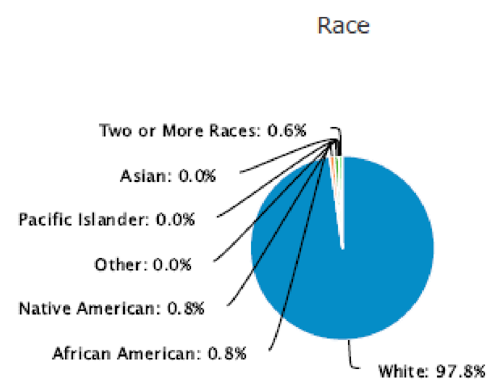
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **.3%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Beals they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **.9%**

National Average: **8.7%**

Social Indicators

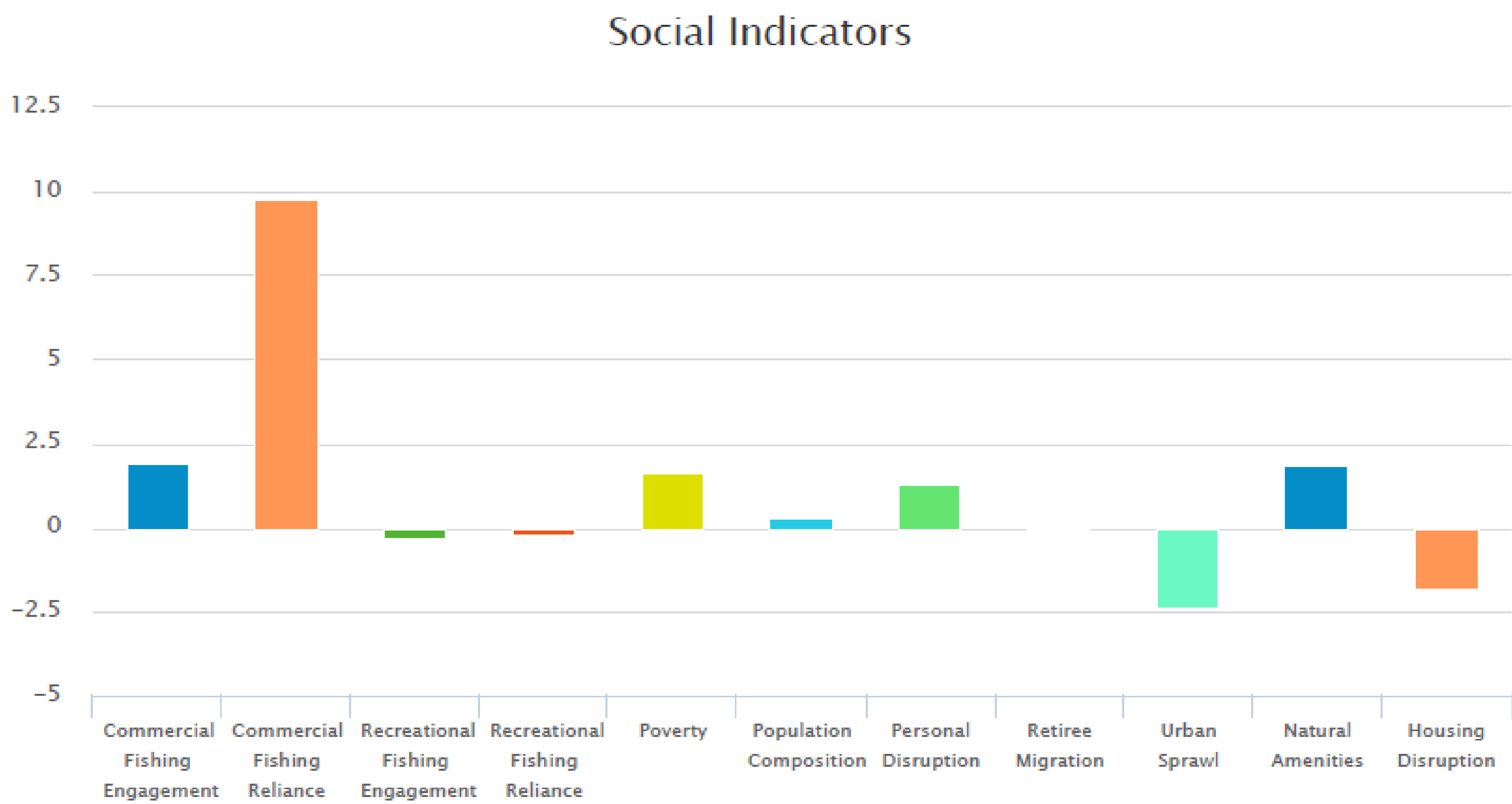
Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Beals that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

Fishing engagement and reliance indices portray the importance or level of dependence of commercial or recreational fishing to coastal communities. The indices include: Commercial Engagement, Commercial Reliance, Recreational Engagement and Recreational Reliance.

Social vulnerability indices represent social factors that can shape either an individual or community's ability to adapt to change. These factors exist within all communities regardless of the importance of fishing. The indices include: Poverty, Population Composition, and Personal Disruption.

Gentrification Pressure indices characterize those factors that, over time may indicate a threat to the viability of a commercial or recreational working waterfront, including infrastructure. The indices include: Retire Migration, Urban Sprawl, Natural Amenities and Housing Disruption.

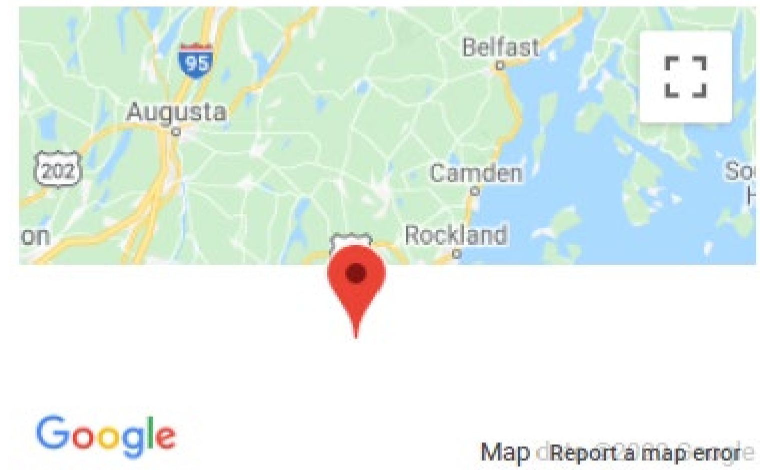
The factor scores for each index are normalized so that zero is the mean. Therefore, a higher value implies more engagement or reliance upon fishing or higher social vulnerability or vulnerability to gentrification. Learn more about the social indicators for fishing communities.



[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Friendship, ME



Where is Friendship located?

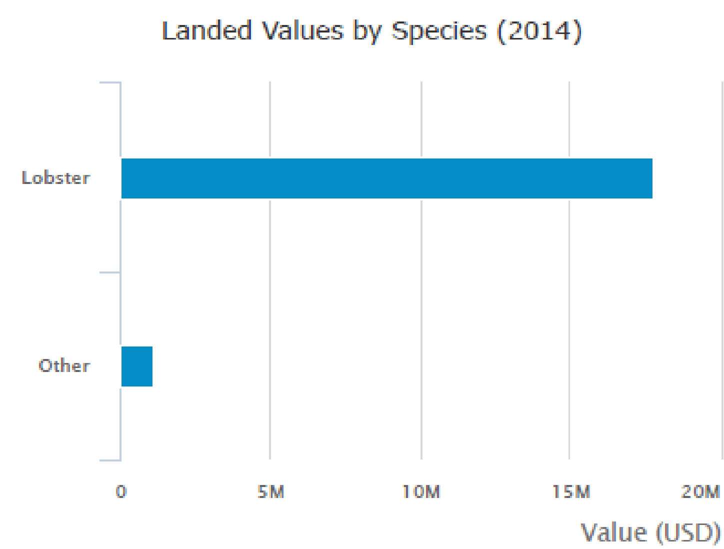
Friendship is a town with a population of 1,152 and classified by the census as falling within a rural area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers.
However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

Involvement in Fisheries

What species are landed in Friendship?

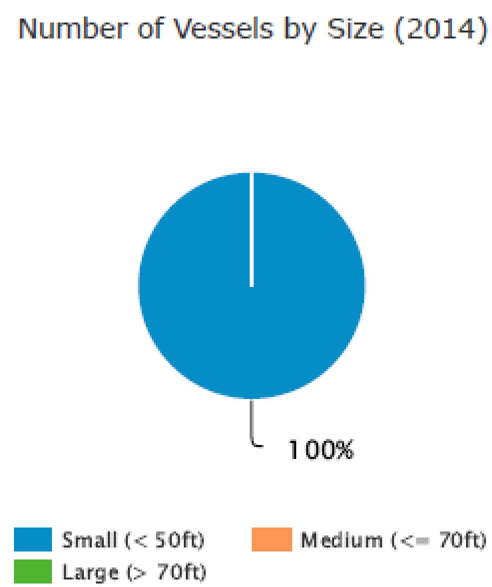
The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Friendship?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.
Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

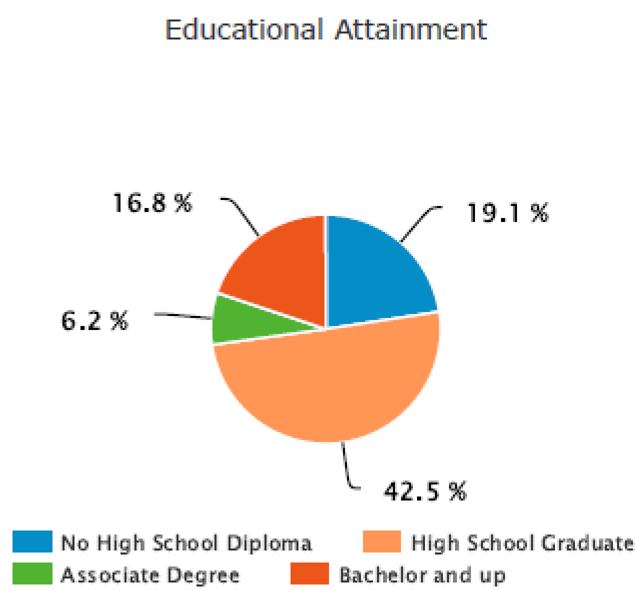


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

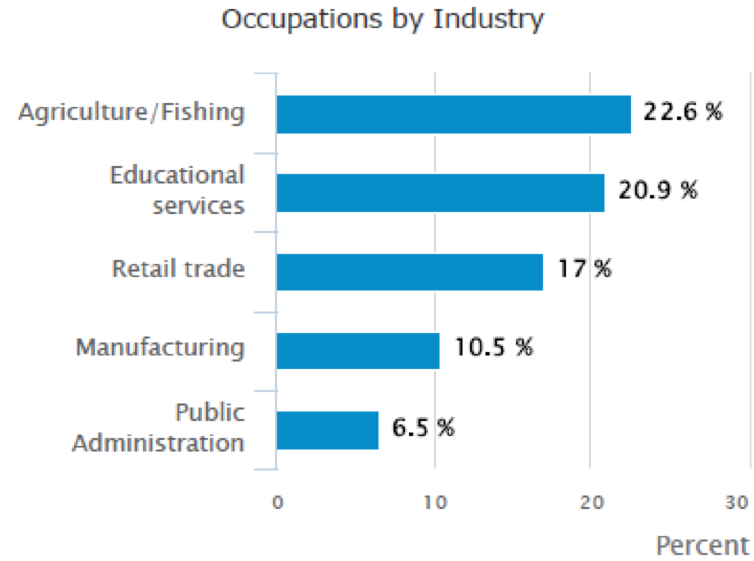
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Friendship?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: 3%

National Rate: 7.9%*

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: $48,026.00

National Average: **$51,914.00** (2011)

Individuals in Friendship living in poverty: 10.9% The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

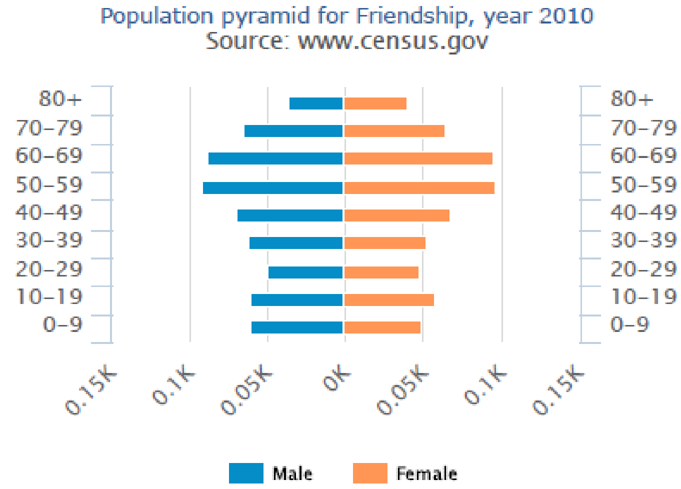
Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

may indicate the presence of universities or a military base.

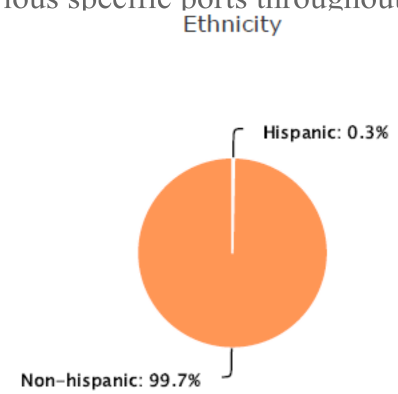
Median age: **50.1**

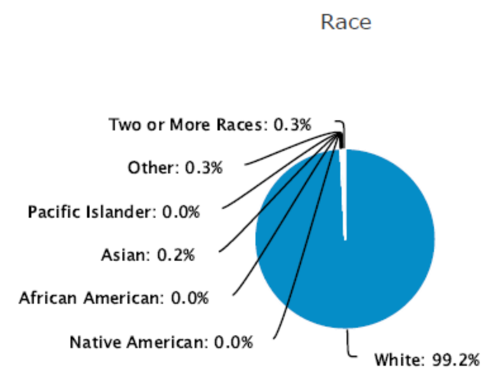
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **.6%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Friendship they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **0%**

National Average: **8.7%**

Social Indicators

Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Friendship that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

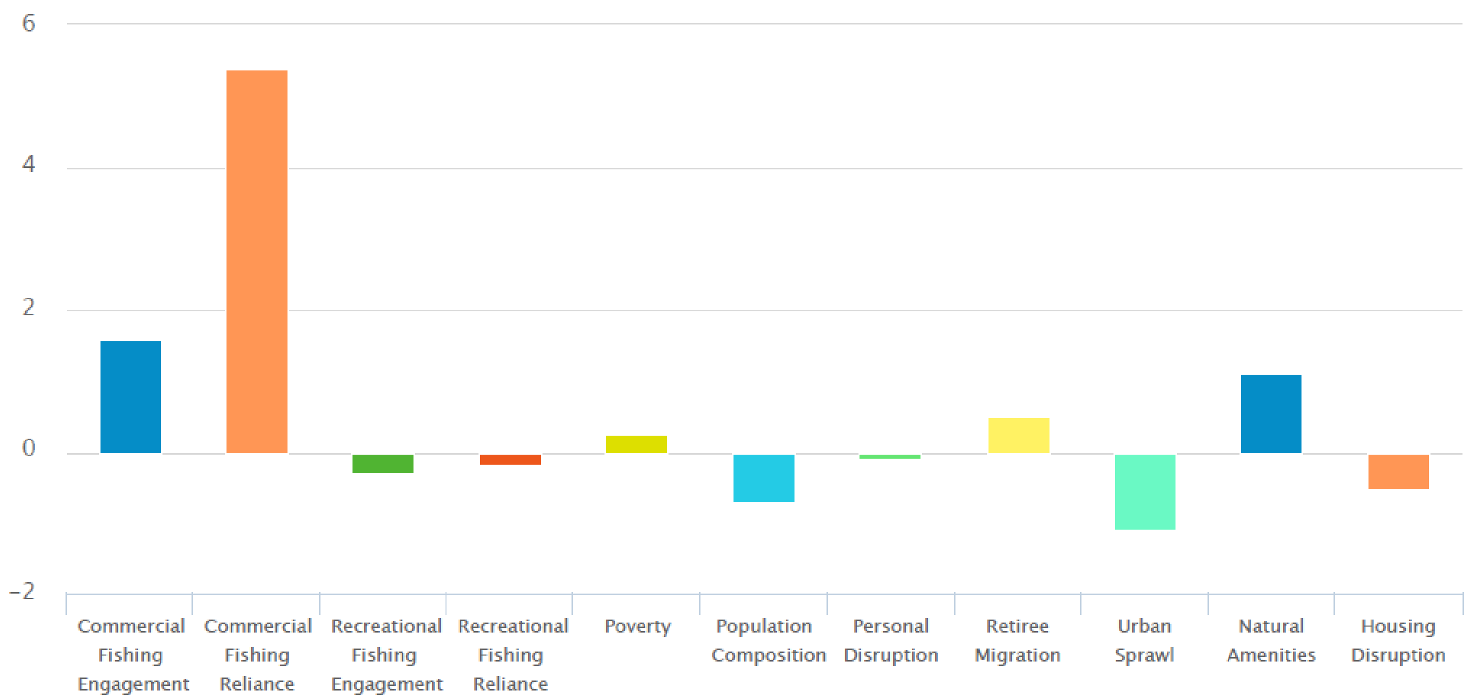
Fishing engagement and reliance indices portray the importance or level of dependence of commercial or recreational fishing to coastal communities. The indices include: Commercial Engagement, Commercial Reliance, Recreational Engagement and Recreational Reliance.

Social vulnerability indices represent social factors that can shape either an individual or community's ability to adapt to change. These factors exist within all communities regardless of the importance of fishing. The indices include: Poverty, Population Composition, and Personal Disruption.

Gentrification Pressure indices characterize those factors that, over time may indicate a threat to the viability of a commercial or recreational working waterfront, including infrastructure. The indices include: Retire Migration, Urban Sprawl, Natural Amenities and Housing Disruption.

The factor scores for each index are normalized so that zero is the mean. Therefore, a higher value implies more engagement or reliance upon fishing or higher social vulnerability or vulnerability to gentrification. Learn more about the
social indicators for fishing communities.

Social Indicators



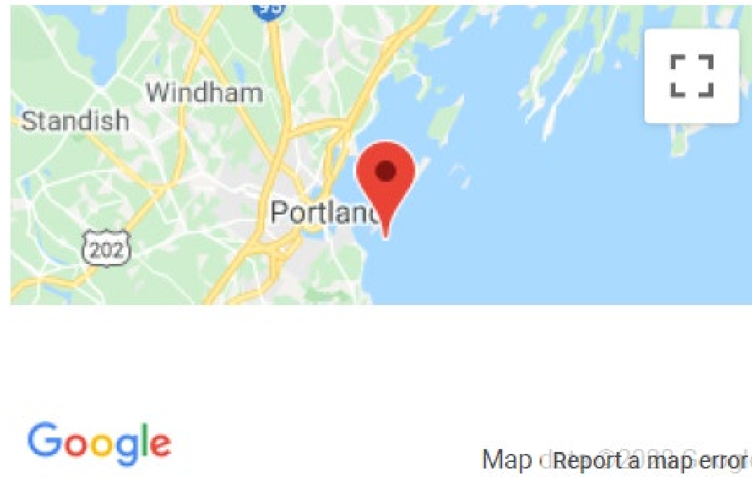
[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Northeast Fisheries Science Center

Social Sciences Branch

Portland, ME



Where is Portland located?

Portland is a town with a population of 66,194 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

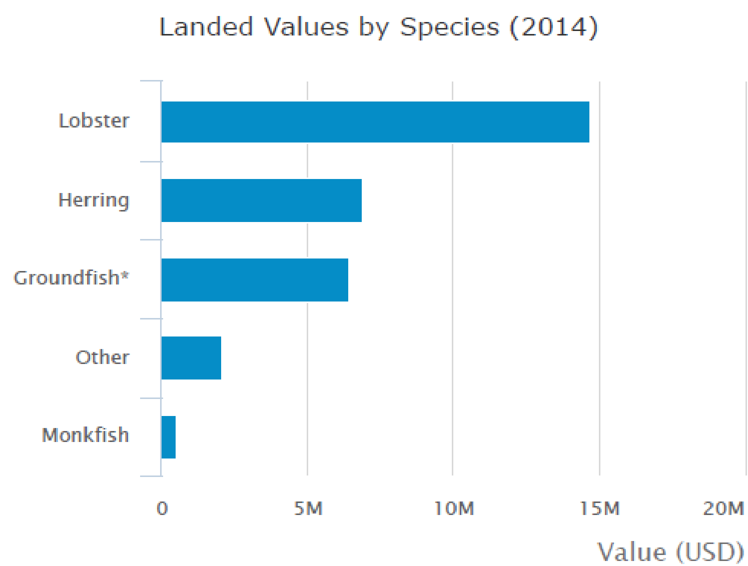
Involvement in Fisheries

What species are landed in Portland?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

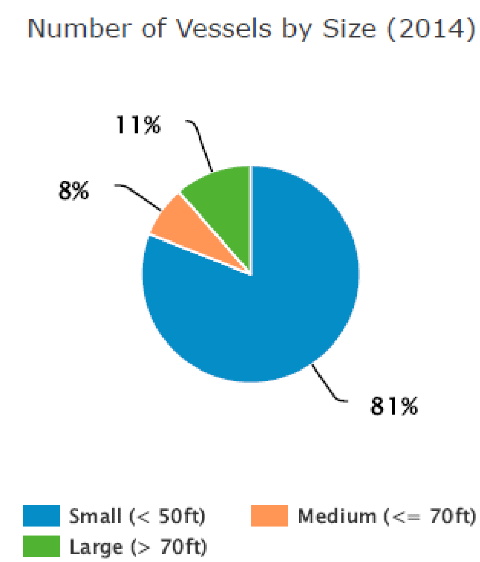
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Portland?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.

Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

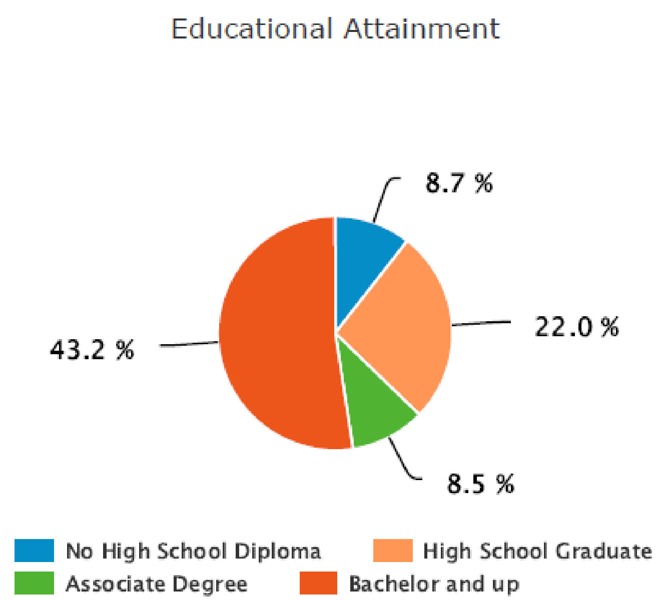


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the

Demographic Attributes

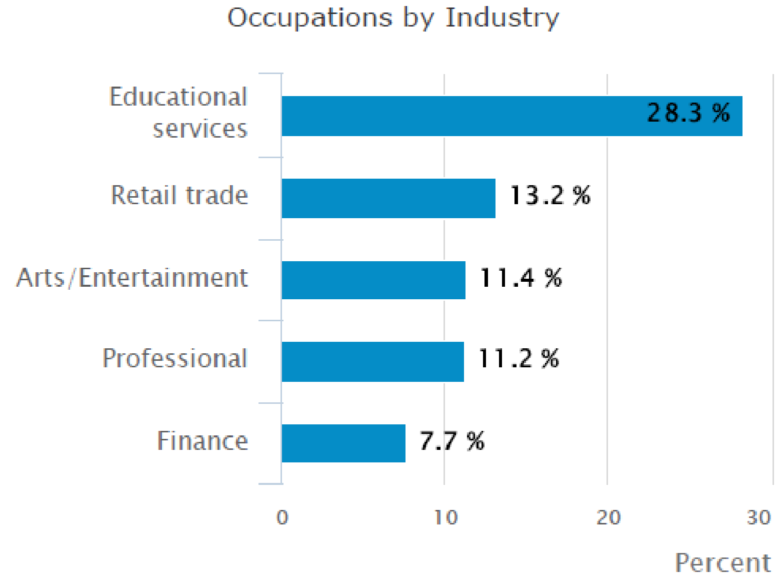
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Portland?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **3.7%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: **$44,422.00**

National Average: **$51,914.00** (2011)

Individuals in Portland living in poverty: **17.5%** The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

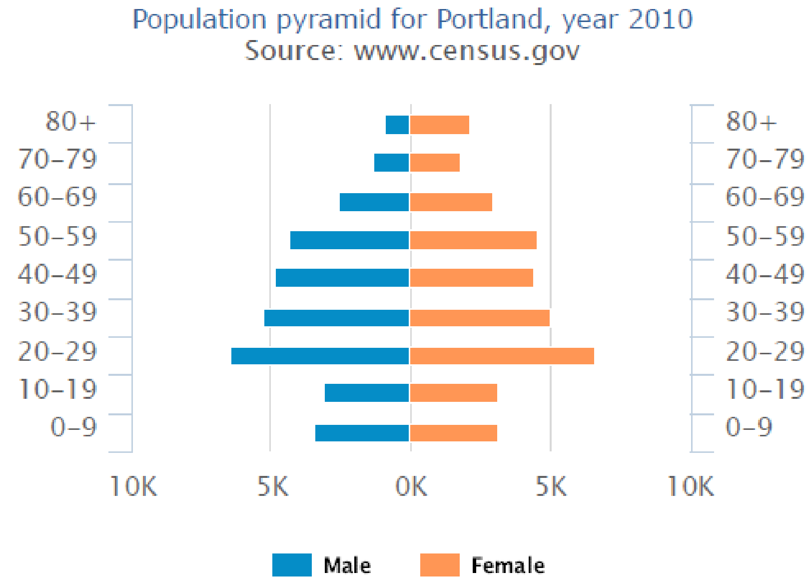
Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

may indicate the presence of universities or a military base.

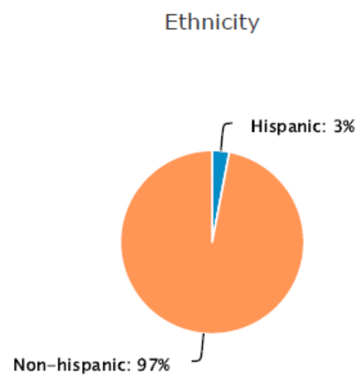
Median age: **36.7**

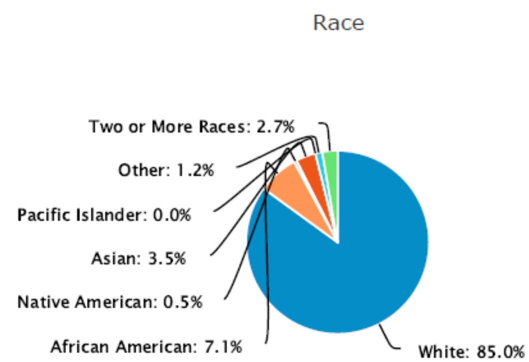
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **11%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Portland they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **6.6%**

National Average: **8.7%**

Social Indicators

Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Portland that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

Fishing engagement and reliance indices portray the importance or level of dependence of commercial or recreational fishing to coastal communities. The indices include: Commercial Engagement, Commercial Reliance, Recreational Engagement and Recreational Reliance.

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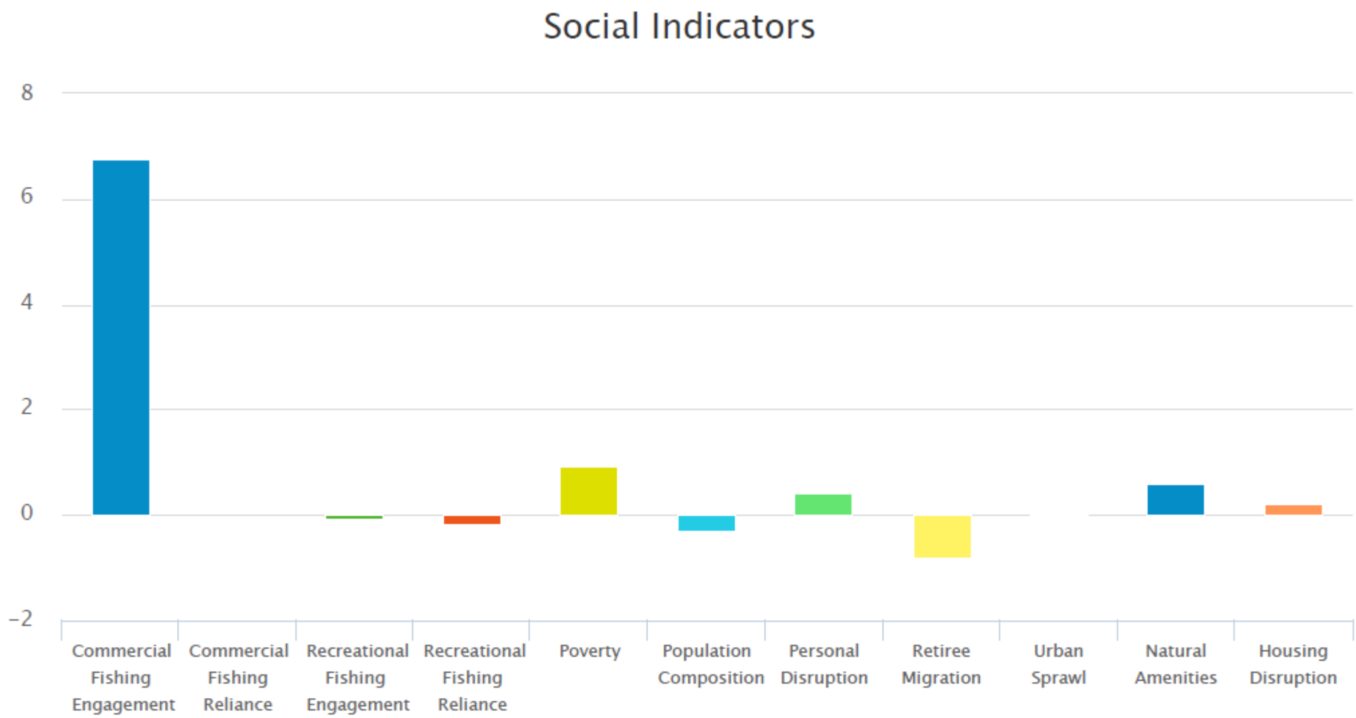

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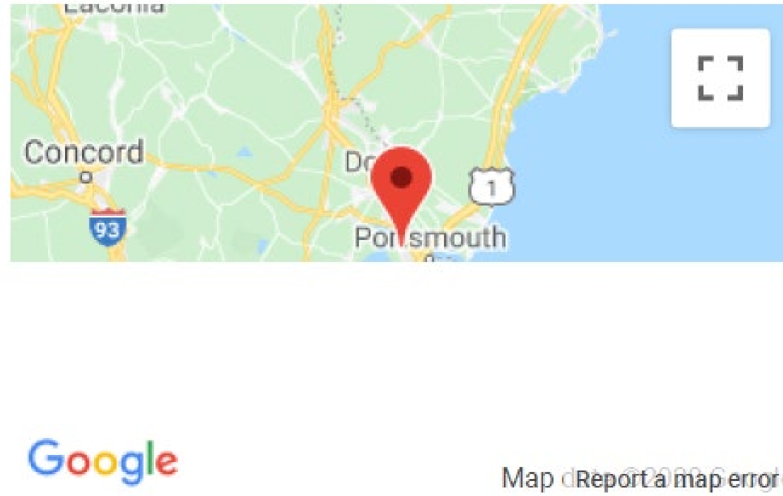
Newington, NH



Where is Newington located?

Newington is a town with a population of 753 and classified by the census as falling within a rural area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

Involvement in Fisheries

What species are landed in Newington?

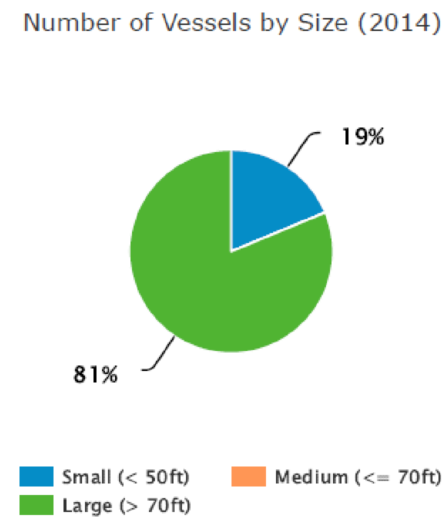
The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

**Whiting includes red hake,ocean pout,black whiting,whiting.

What are the characteristics of the fishing vessels in Newington?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location. Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

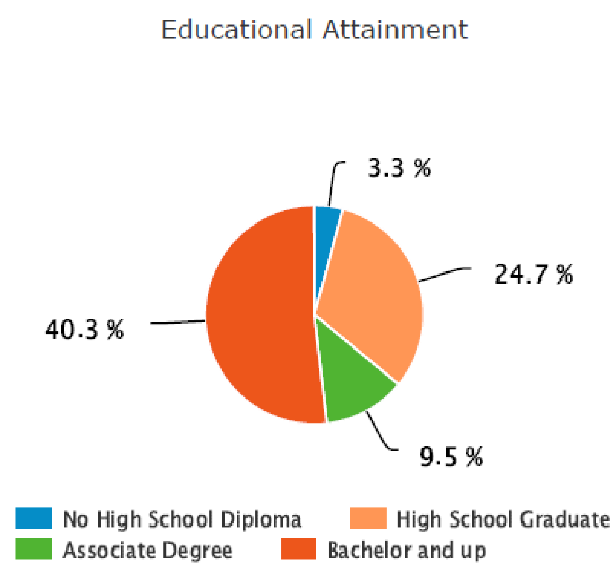


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

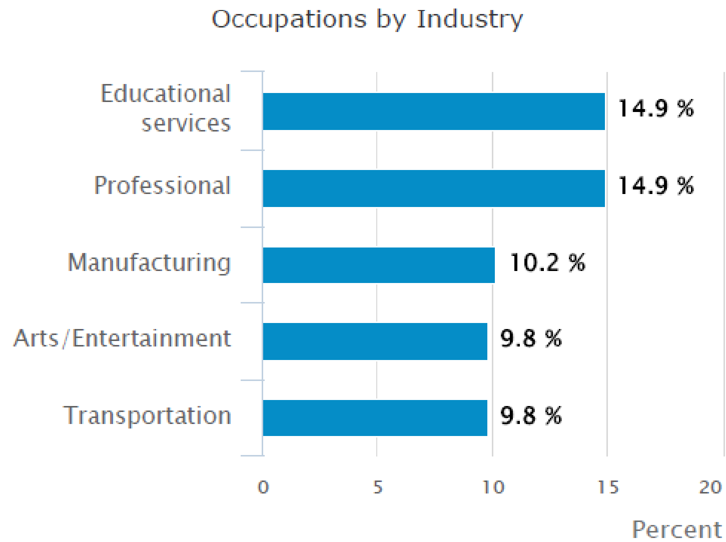
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Newington?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **0.9%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

Median Household Income: **$78,500.00**

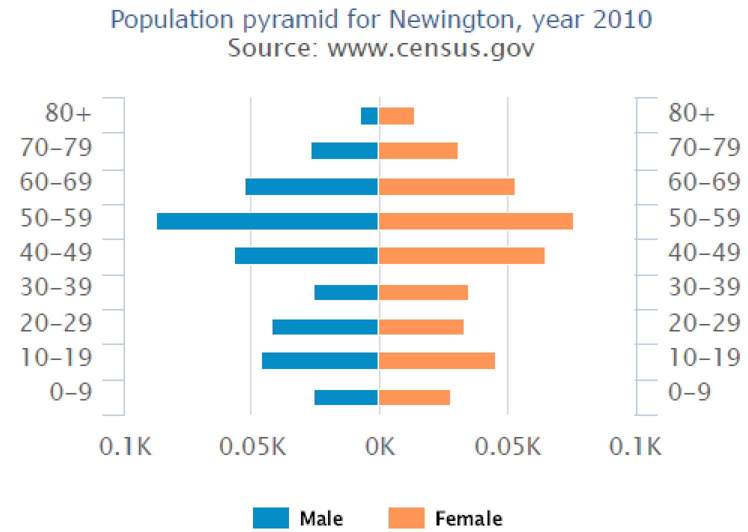
National Average: **$51,914.00** (2011)

Individuals in Newington living in poverty: **6.8%** The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

may indicate the presence of universities or a military base.

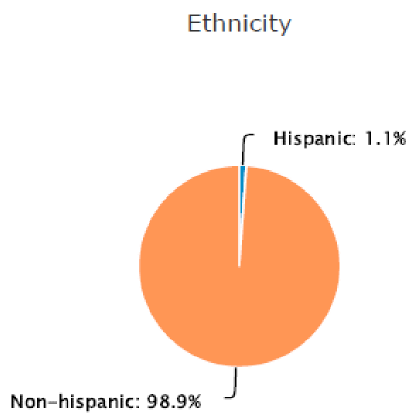
Median age: **48**

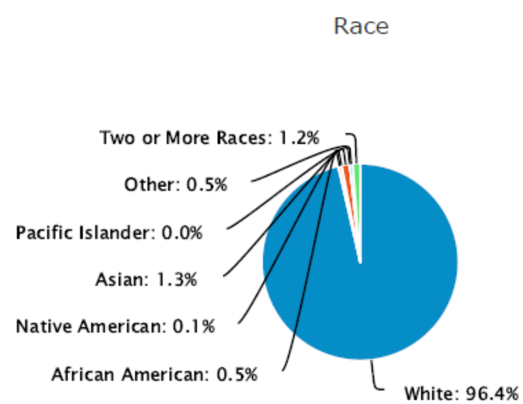
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **4.7%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Newington they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **.4%**

National Average: **8.7%**

Social Indicators

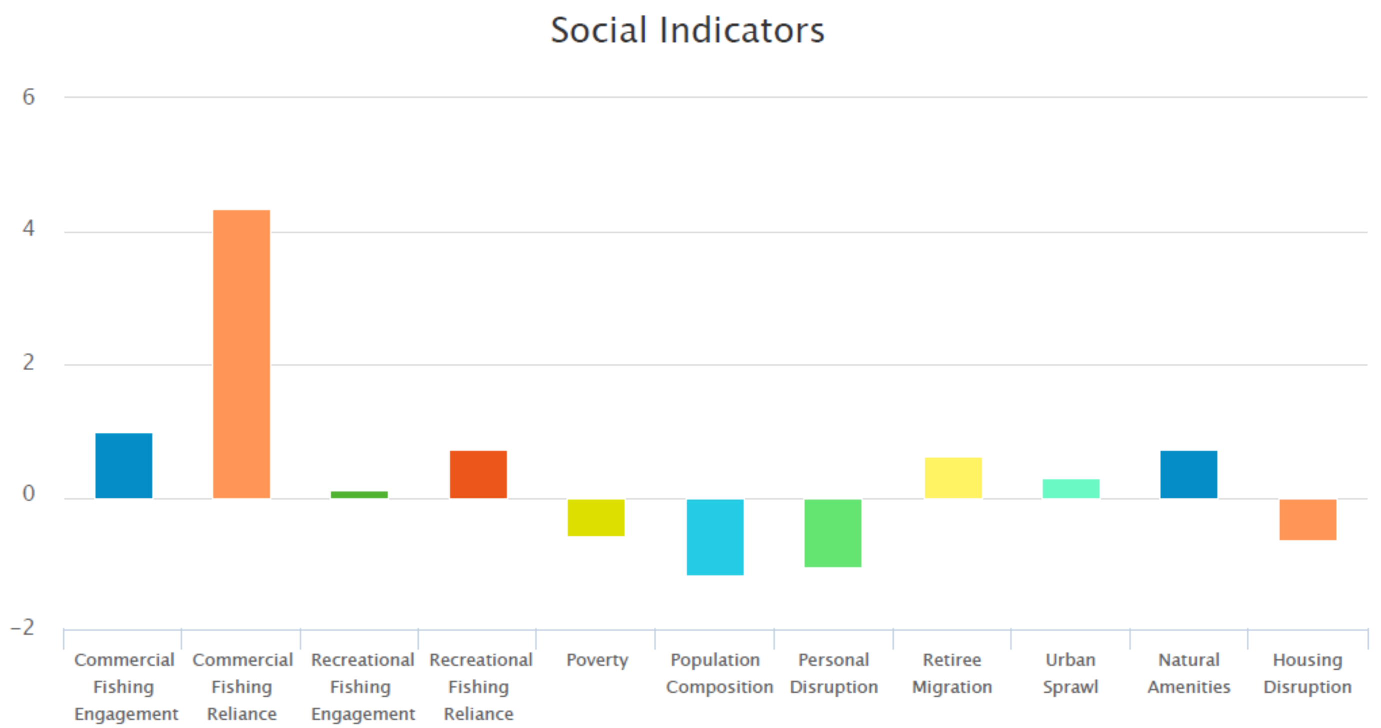
Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Newington that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

Fishing engagement and reliance indices portray the importance or level of dependence of commercial or recreational fishing to coastal communities. The indices include: Commercial Engagement, Commercial Reliance, Recreational Engagement and Recreational Reliance.

Social vulnerability indices represent social factors that can shape either an individual or community's ability to adapt to change. These factors exist within all communities regardless of the importance of fishing. The indices include: Poverty, Population Composition, and Personal Disruption.

Gentrification Pressure indices characterize those factors that, over time may indicate a threat to the viability of a commercial or recreational working waterfront, including infrastructure. The indices include: Retire Migration, Urban Sprawl, Natural Amenities and Housing Disruption.

The factor scores for each index are normalized so that zero is the mean. Therefore, a higher value implies more engagement or reliance upon fishing or higher social vulnerability or vulnerability to gentrification. Learn more about the
social indicators for fishing communities.



[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Portsmouth, NH

Where is Portsmouth located?

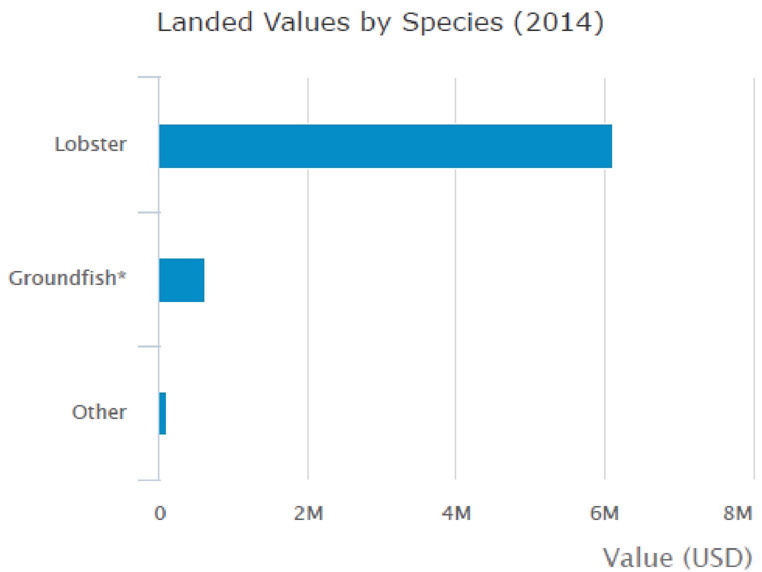
Portsmouth is a town with a population of 20,779 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

Involvement in Fisheries

What species are landed in Portsmouth?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

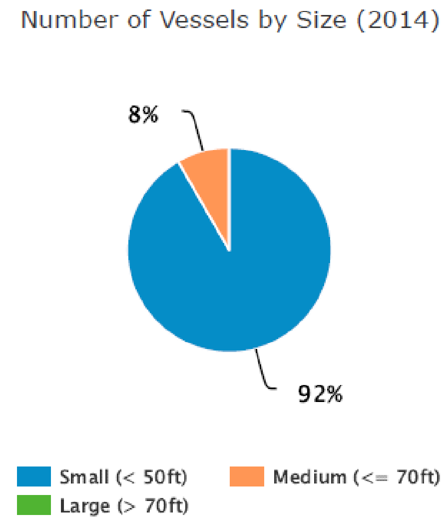
*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Portsmouth?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.

Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

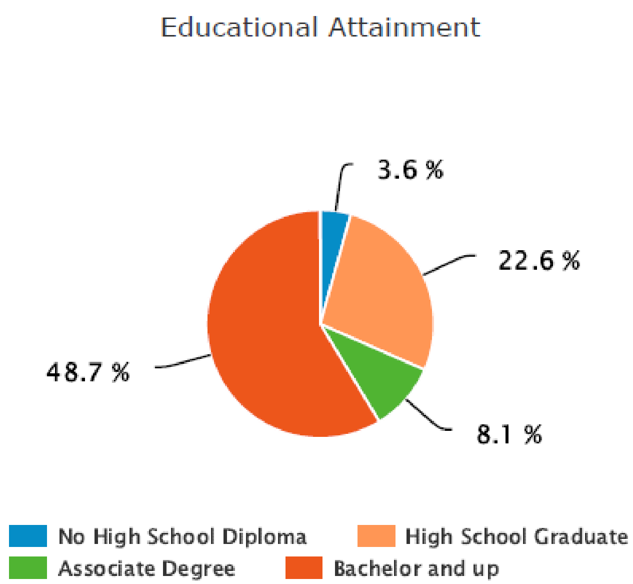


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

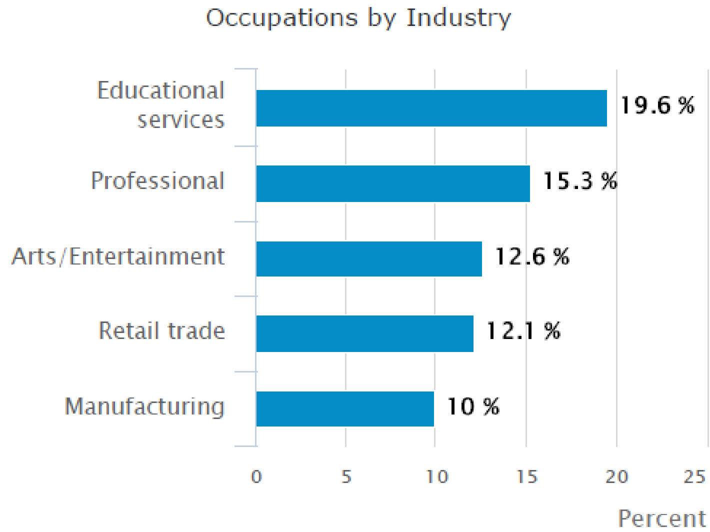
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Portsmouth?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **3.6%**

National Rate: 7.9%*

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

Median Household Income: **$62,191.00**

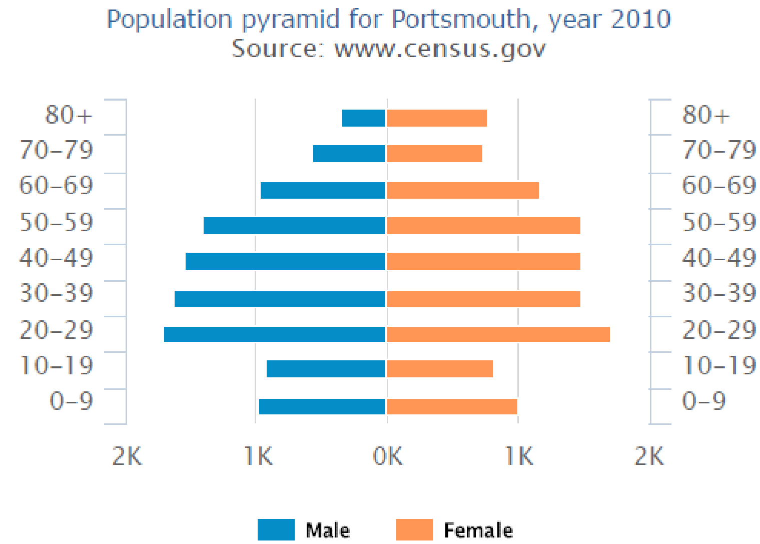
National Average: **$51,914.00** (2011)

Individuals in Portsmouth living in poverty: **8.7%** The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

may indicate the presence of universities or a military base.

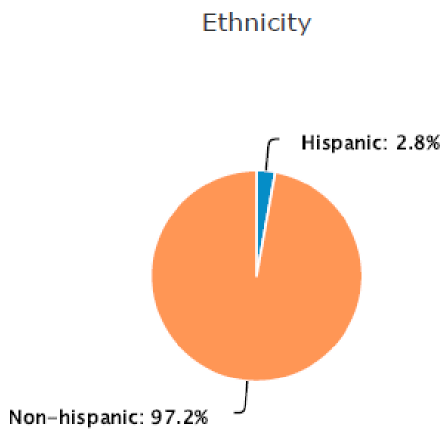
Median age: **40.3**

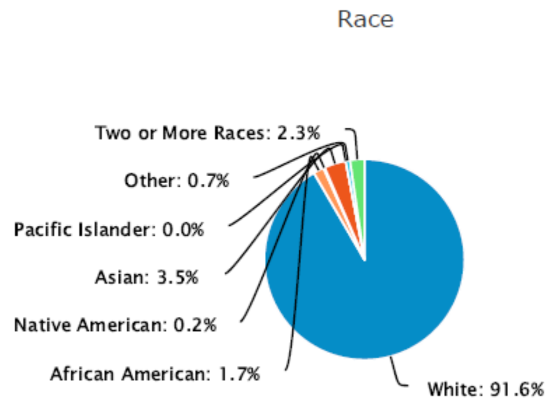
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **5.6%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Portsmouth they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **1.5%**

National Average: **8.7%**

Social Indicators

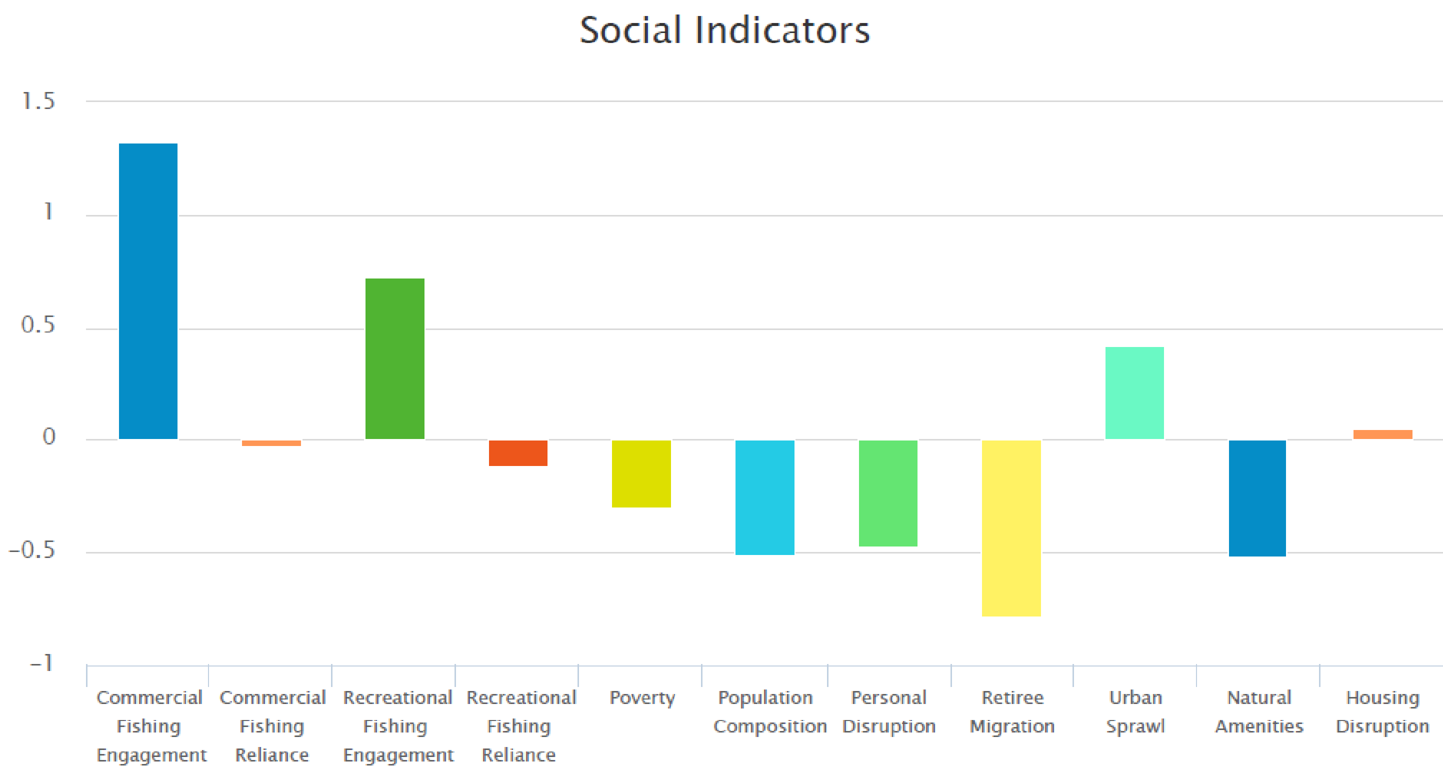
Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Portsmouth that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

Fishing engagement and reliance indices portray the importance or level of dependence of commercial or recreational fishing to coastal communities. The indices include: Commercial Engagement, Commercial Reliance, Recreational Engagement and Recreational Reliance.

Social vulnerability indices represent social factors that can shape either an individual or community's ability to adapt to change. These factors exist within all communities regardless of the importance of fishing. The indices include: Poverty, Population Composition, and Personal Disruption.

Gentrification Pressure indices characterize those factors that, over time may indicate a threat to the viability of a commercial or recreational working waterfront, including infrastructure. The indices include: Retire Migration, Urban Sprawl, Natural Amenities and Housing Disruption.

The factor scores for each index are normalized so that zero is the mean. Therefore, a higher value implies more engagement or reliance upon fishing or higher social vulnerability or vulnerability to gentrification. Learn more about the
social indicators for fishing communities.



[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Northeast Fisheries Science Center

Social Sciences Branch

Gloucester, MA

Where is Gloucester located?

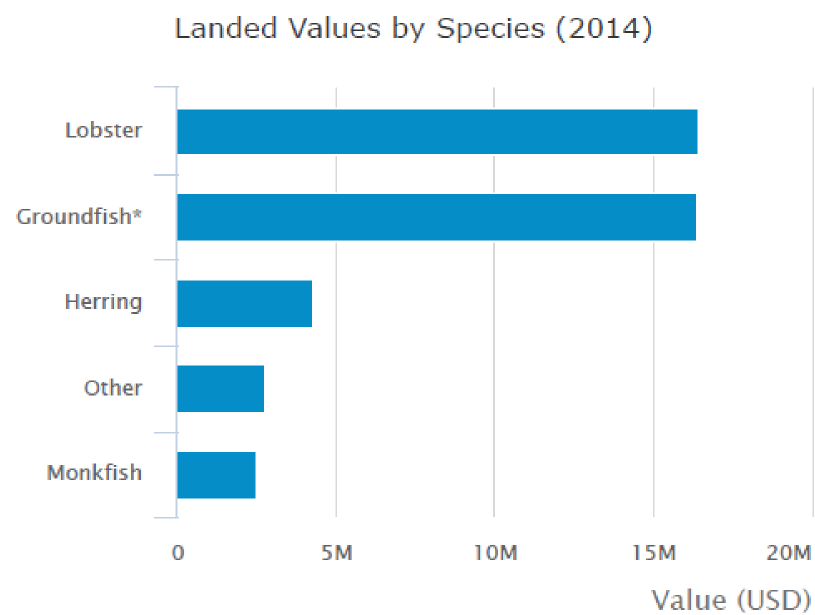
Gloucester is a town with a population of 28,789 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

Involvement in Fisheries

What species are landed in Gloucester?

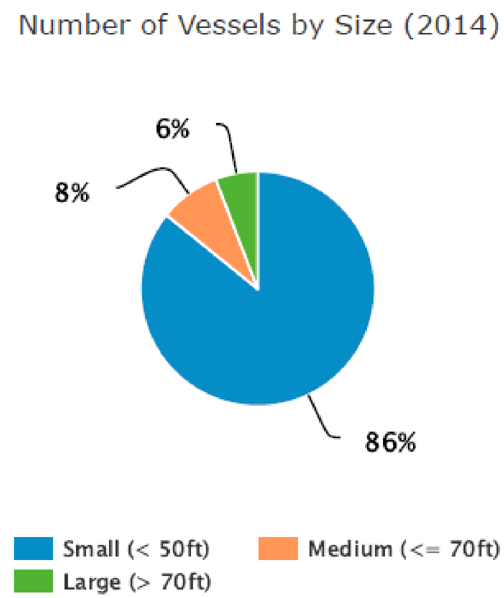
The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Gloucester?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.
Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

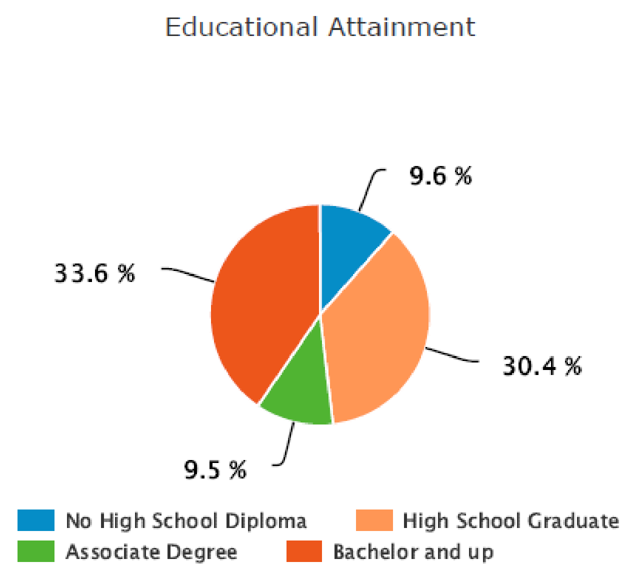


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

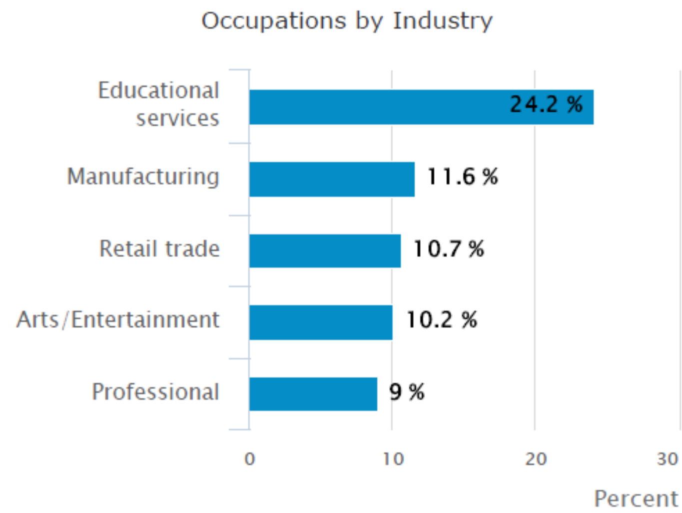
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community



How do people make a living in Gloucester?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **4%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

Median Household Income: **$60,506.00**

National Average: **$51,914.00** (2011)

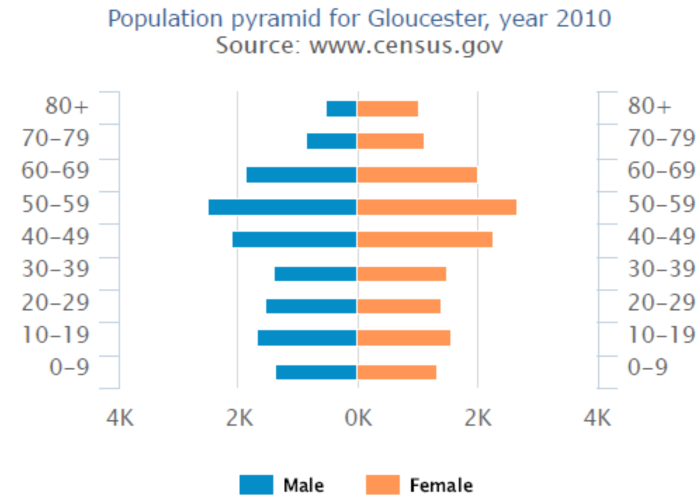
Individuals in Gloucester living in poverty: **7.8%**

The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

may indicate the presence of universities or a military base.

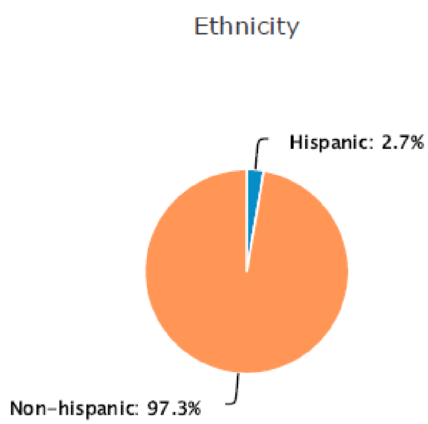
Median age: **46.4**

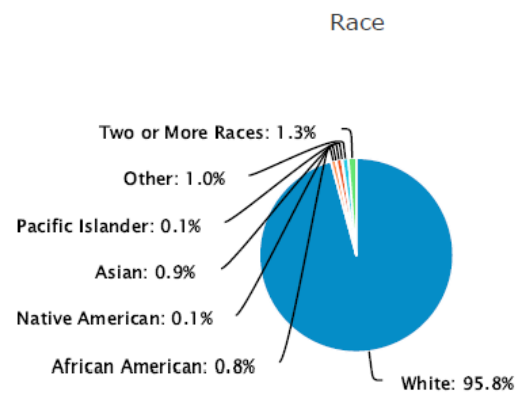
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: 7%

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Gloucester they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **4%**

National Average: **8.7%**

Social Indicators

Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Gloucester that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

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Learn more about the
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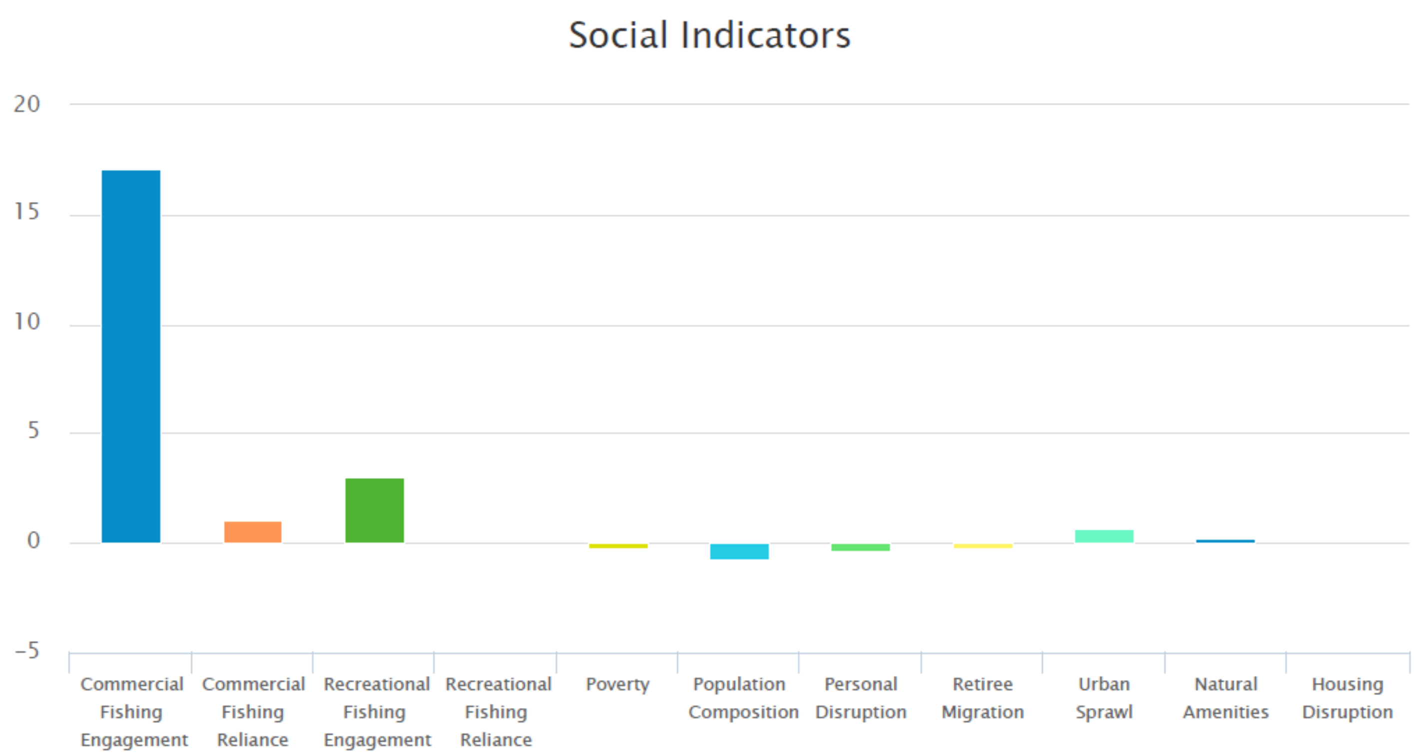

[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

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Northeast Fisheries Science Center

Social Sciences Branch

New Bedford, MA

Where is New Bedford located?

New Bedford is a town with a population of 95,072 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

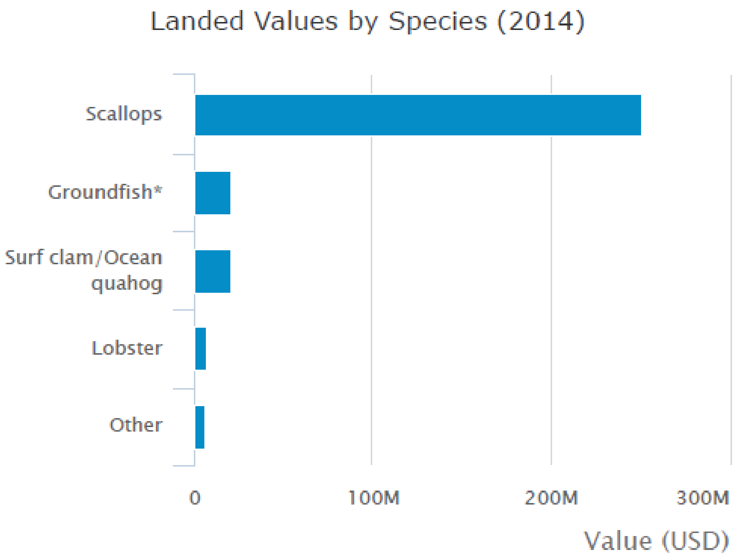
Involvement in Fisheries

What species are landed in New Bedford?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

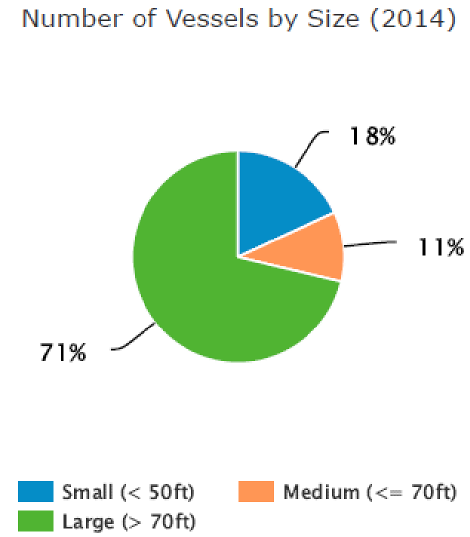
*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in New Bedford?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.
Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.



Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

Educational Attainment

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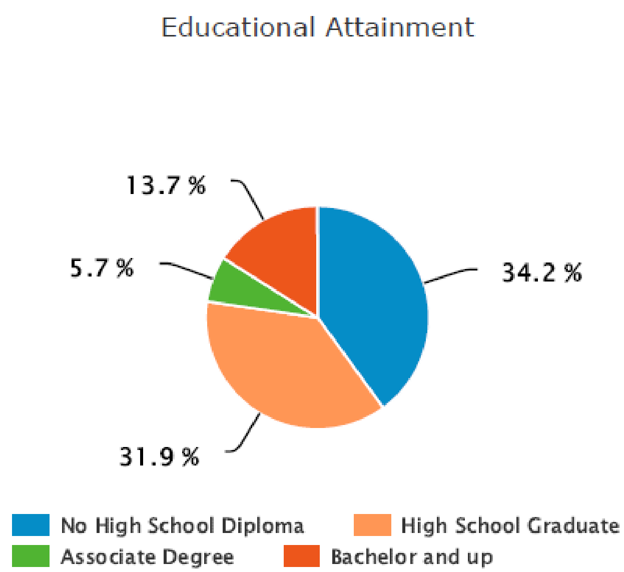
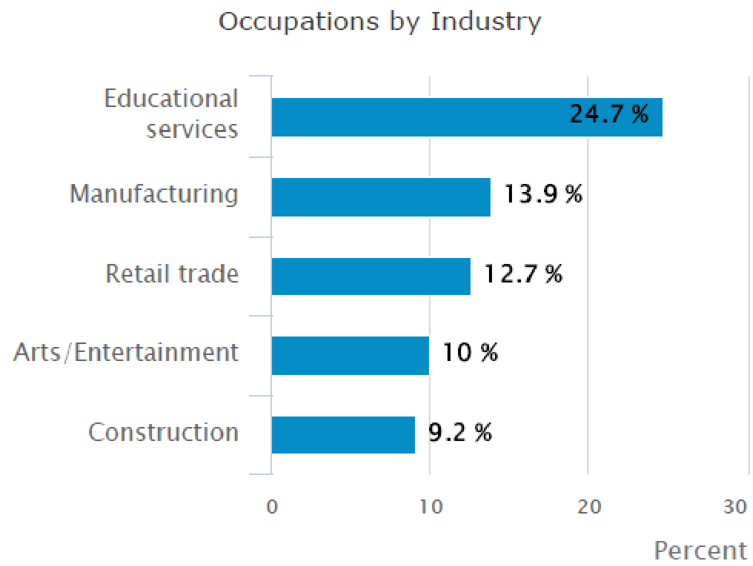


How do people make a living in New Bedford?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **6.2%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: **$36,172.00**

National Average: **$51,914.00** (2011)

Individuals in New Bedford living in poverty:
22.7%

The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

Age structure of residents

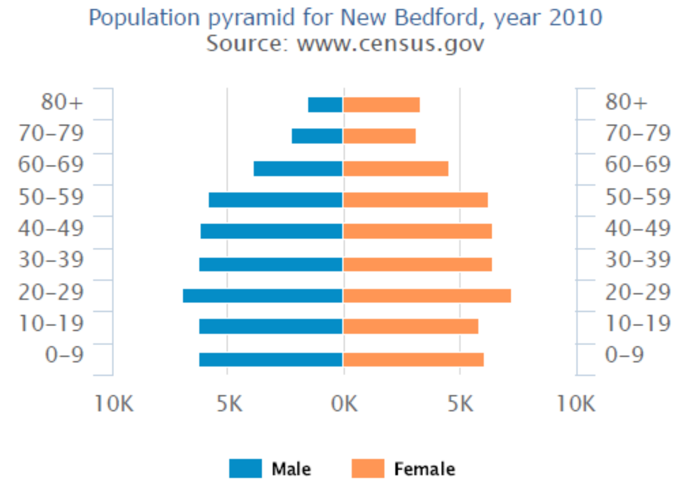
Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community.

A very

large population of young people, on the other hand, may indicate the presence of universities or a military base.

Median age: **36.6**

National median: **37.2**



Ethnicity and Race

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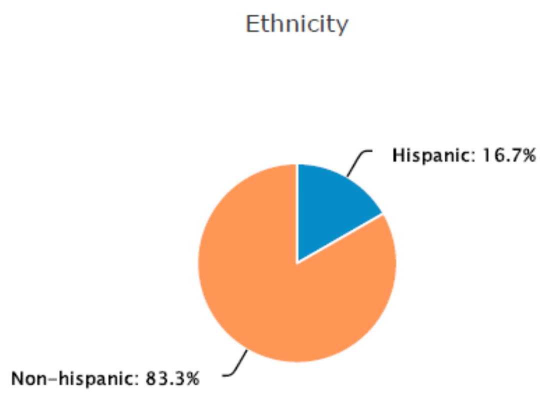

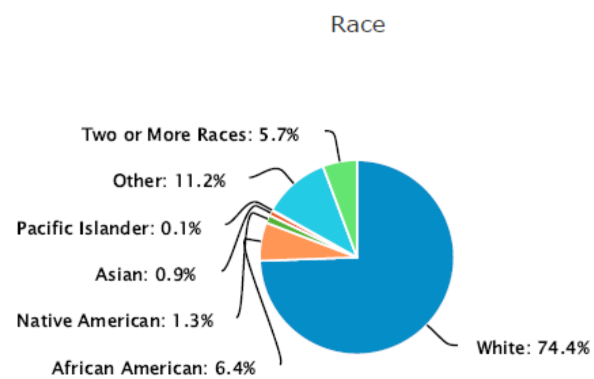

Language and Marginalization

Foreign Born: 20%

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National Average: **12.7%**

Speak English less than very well: **17.2%**

National Average: **8.7%**

Social Indicators

Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for New Bedford that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

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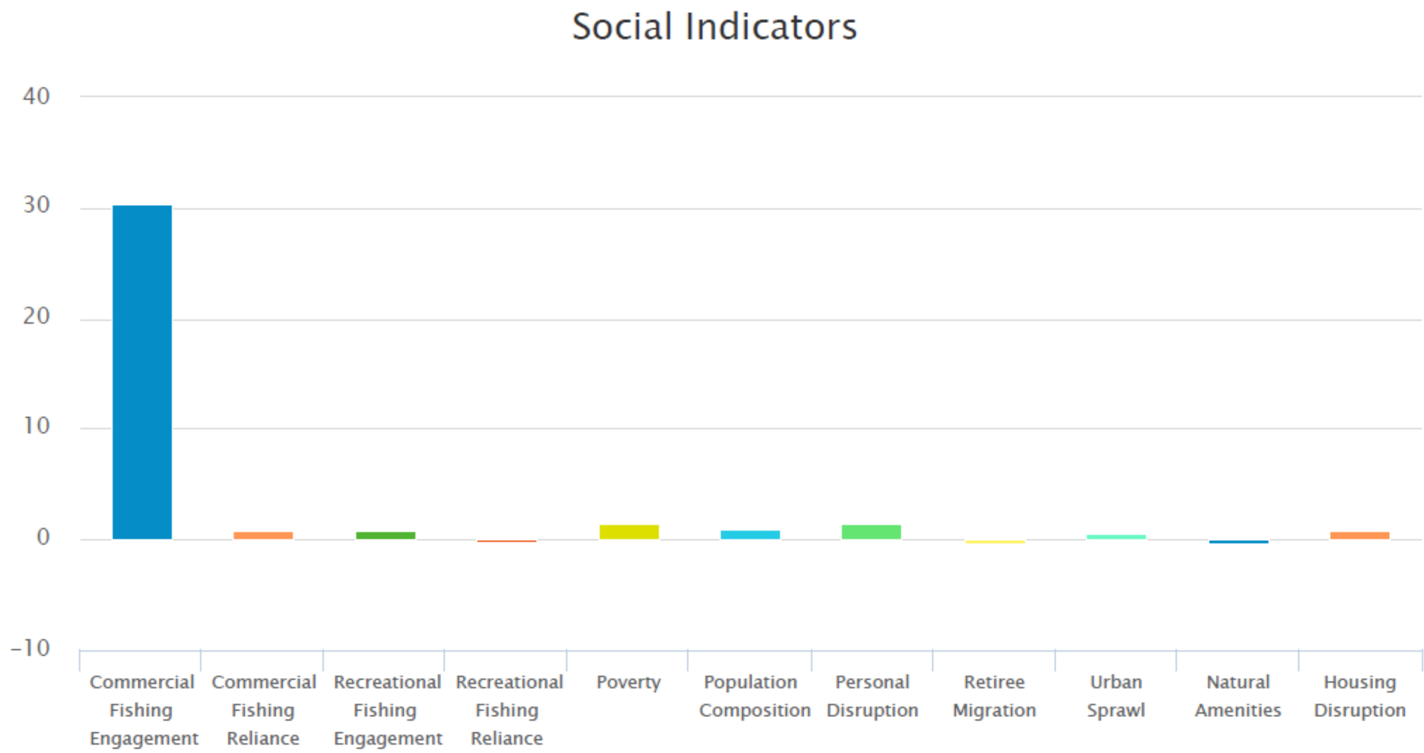


[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Rockport, MA

Where is Rockport located?

Rockport is a town with a population of 6,952 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

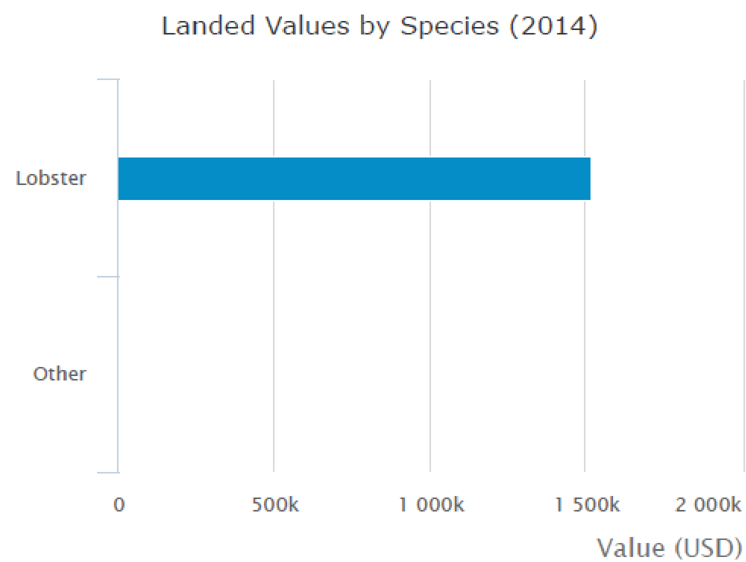
Involvement in Fisheries

What species are landed in Rockport?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

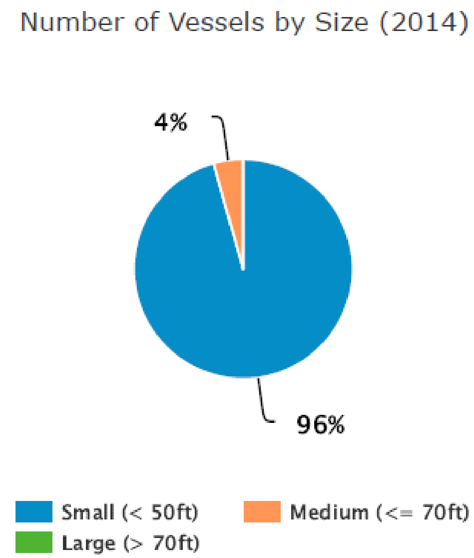
**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Rockport?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.

Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.

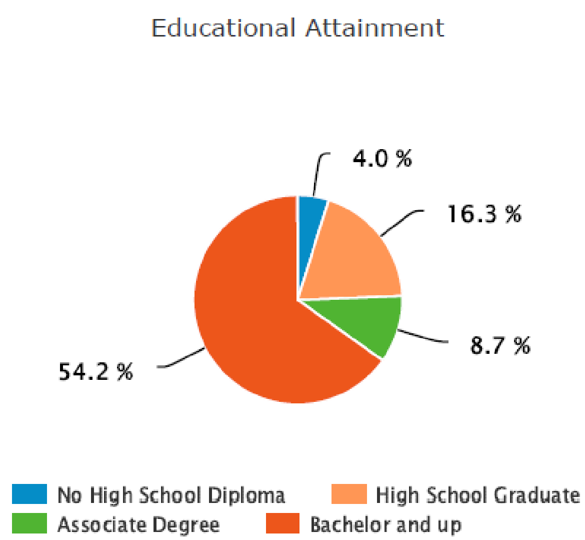


Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

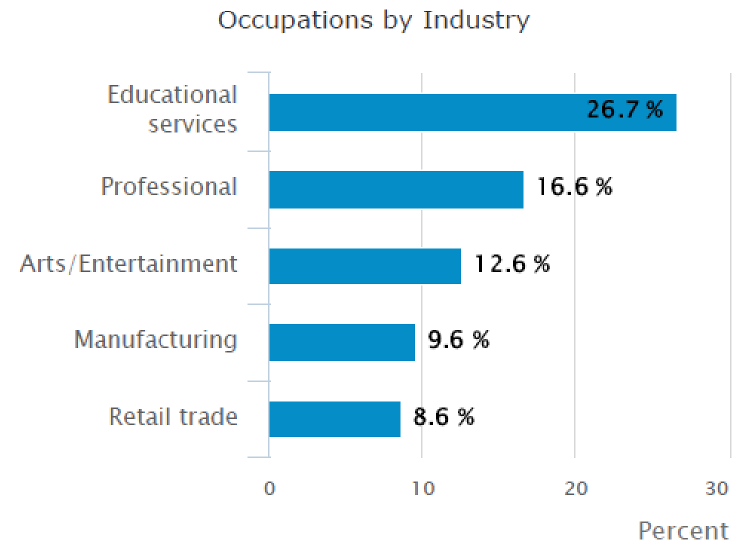
Educational Attainment

The level of educational attainment in a community is associated with issues important for community development, such as income and poverty levels, unemployment rates, and local participation in community activities.



How do people make a living in Rockport?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **5.2%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

Median Household Income: **$70,625.00**

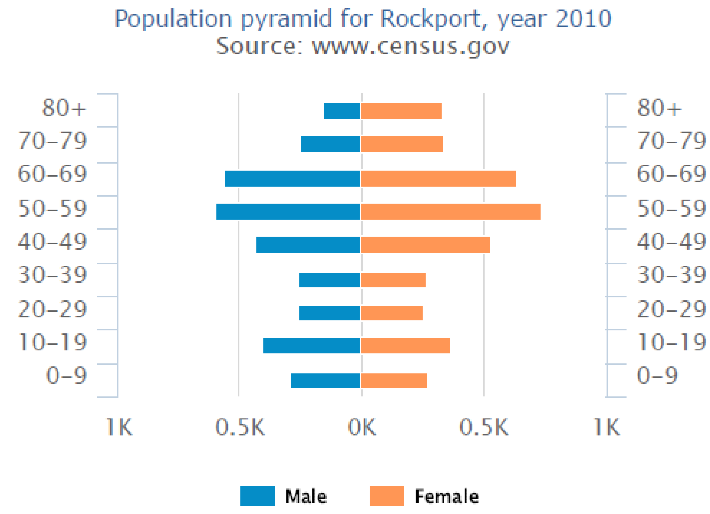
National Average: **$51,914.00** (2011)

Individuals in Rockport living in poverty: **3.7%** The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

may indicate the presence of universities or a military base.

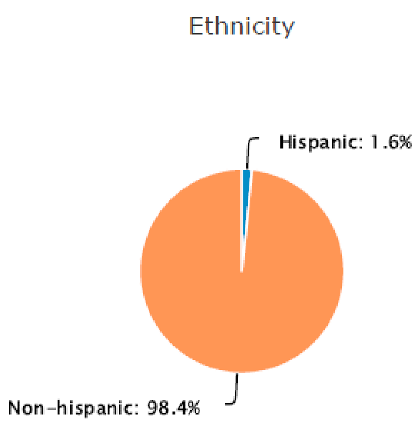
Median age: **51.2**

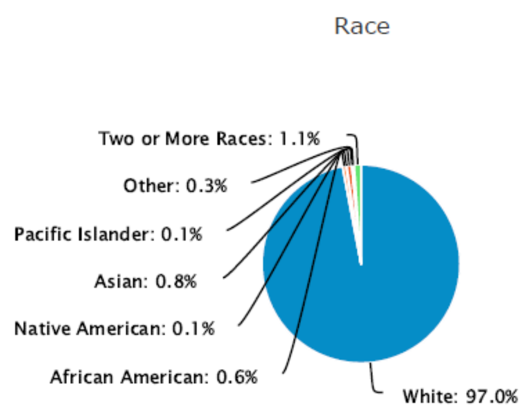
National median: **37.2**



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **3.9%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Rockport they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **1.1%**

National Average: **8.7%**

Social Indicators

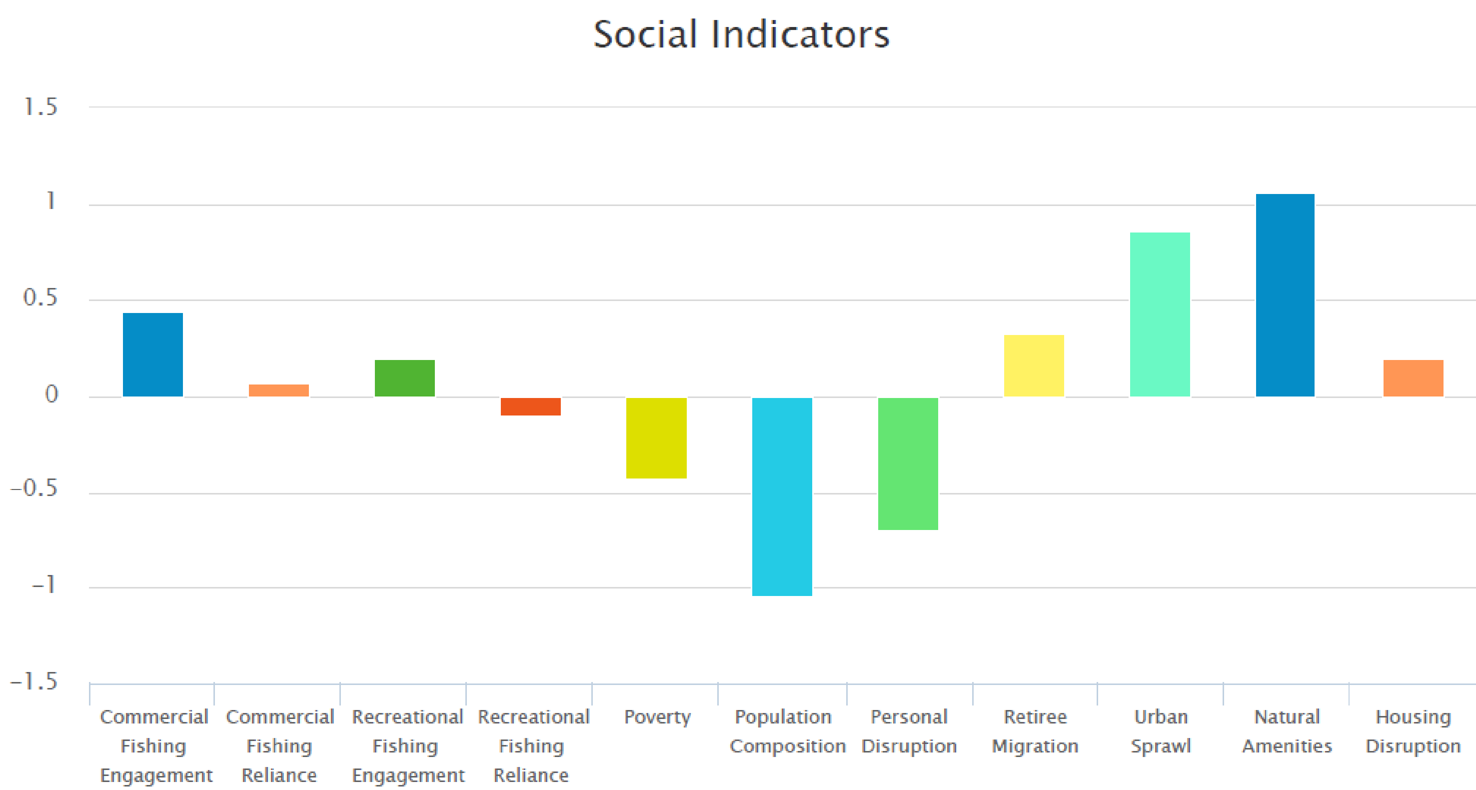
Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Rockport that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

Fishing engagement and reliance indices portray the importance or level of dependence of commercial or recreational fishing to coastal communities. The indices include: Commercial Engagement, Commercial Reliance, Recreational Engagement and Recreational Reliance.

Social vulnerability indices represent social factors that can shape either an individual or community's ability to adapt to change. These factors exist within all communities regardless of the importance of fishing. The indices include: Poverty, Population Composition, and Personal Disruption.

Gentrification Pressure indices characterize those factors that, over time may indicate a threat to the viability of a commercial or recreational working waterfront, including infrastructure. The indices include: Retire Migration, Urban Sprawl, Natural Amenities and Housing Disruption.

The factor scores for each index are normalized so that zero is the mean. Therefore, a higher value implies more engagement or reliance upon fishing or higher social vulnerability or vulnerability to gentrification. Learn more about the social indicators for fishing communities.



[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

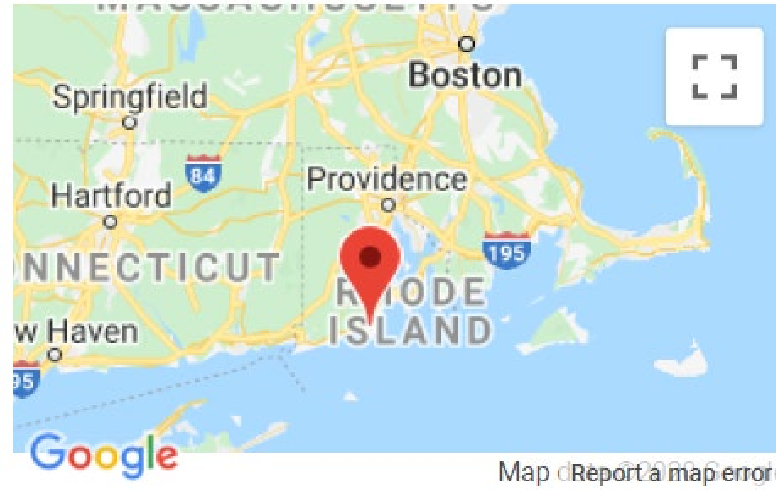
[2]Categories available are: Less than 9th grade; 9th to 12th grade, no diploma; High school graduate (includes equivalency); Some college, no degree; Associate's degree; Bachelor's degree; Graduate or professional degree.

Point Judith/Narragansett, RI

Where is Point Judith/Narragansett located?

Point Judith/Narragansett is a town with a population of 15,868 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum.

Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers. However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]



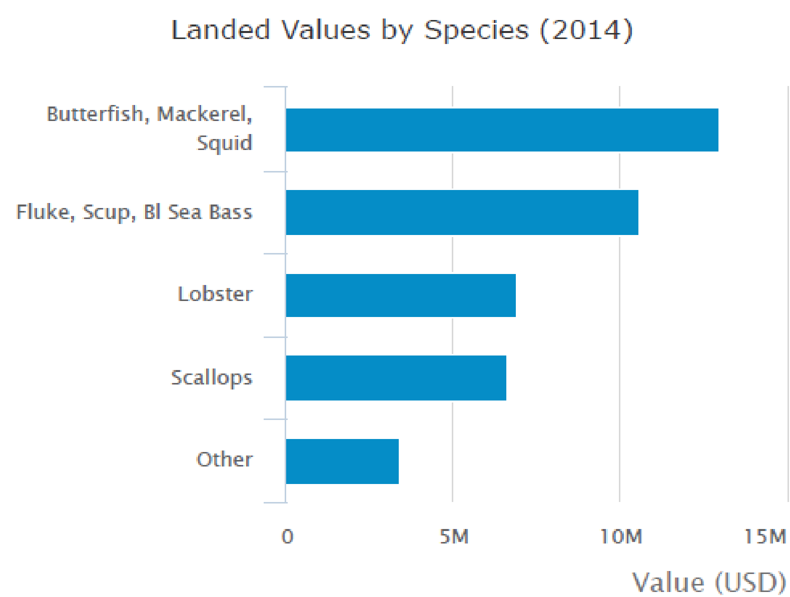
Involvement in Fisheries

What species are landed in Point Judith/Narragansett?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

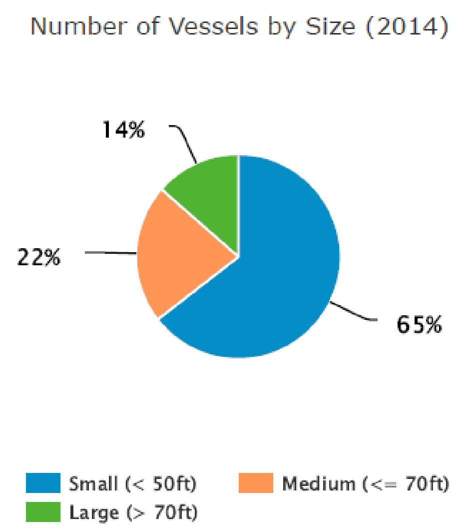
*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

**Whiting includes red hake,ocean pout,black whiting,whiting.



What are the characteristics of the fishing vessels in Point Judith/Narragansett?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.
Size also matters. Larger vessels can travel farther offshore and stay out for longer periods more easily than smaller vessels. These differences also affect family life. Smaller dayboat fishermen tend to return home every day whereas fishermen on larger vessels may be away from home for weeks on long and distant fishing expeditions.



Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

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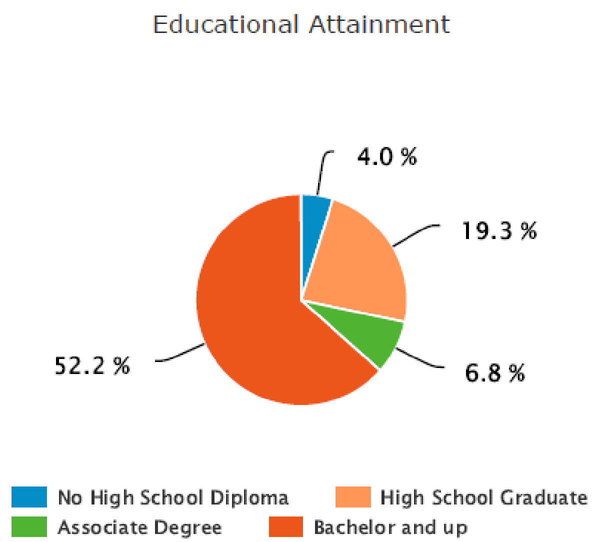
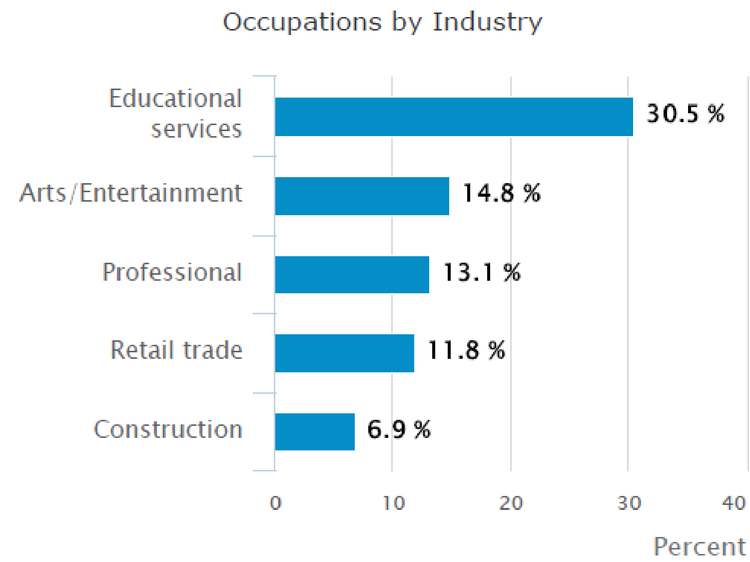


How do people make a living in Point Judith/Narragansett?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **3.3%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: **$57,906.00**

National Average: **$51,914.00** (2011)

Individuals in Point Judith/Narragansett living in poverty: **17.2%**

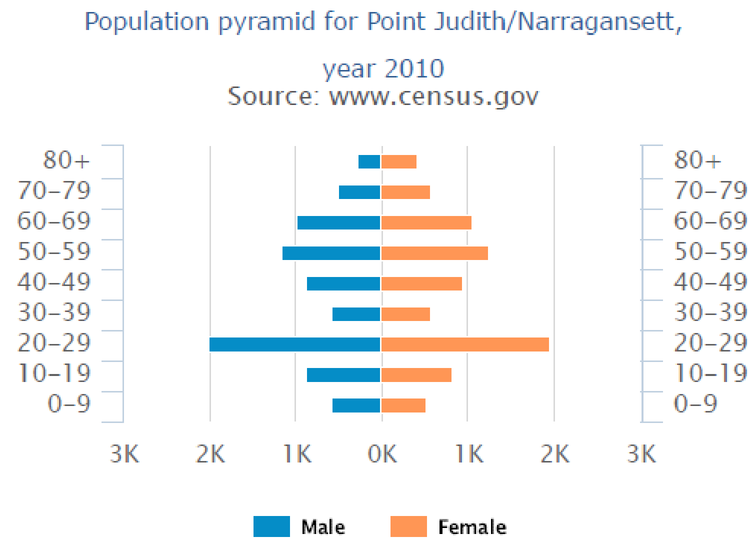
The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town’s population living under this economic threshold is an indicator of the residents’ ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen’s access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand, may indicate the presence of universities or a military base.

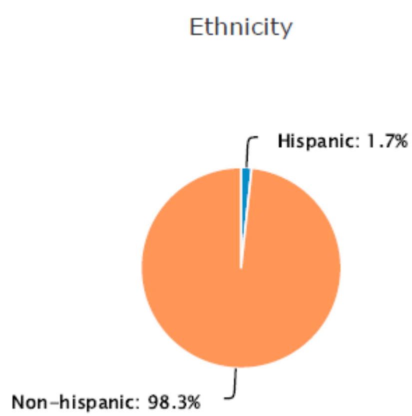
Median age: **40.4**

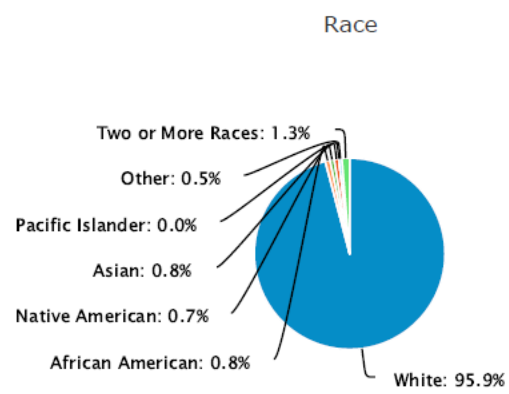
National median:



Ethnicity and Race

These factors give a sense of the cultural context of the community, and the relationship of fishing families and groups to the community in which they live. Is this community racially and ethnically diverse? In the northeast region, ethnic diversity in coastal communities tends to be higher in the Mid Atlantic than in New England, though there are significant exceptions in some fishing ports. Moreover, certain ethnic groups have long been associated with fishing in various specific ports throughout the region.





Language and Marginalization

Foreign Born: **2.7%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Point Judith/Narragansett they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **1.8%**

National Average: **8.7%**

Social Indicators

Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Point Judith/Narragansett that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

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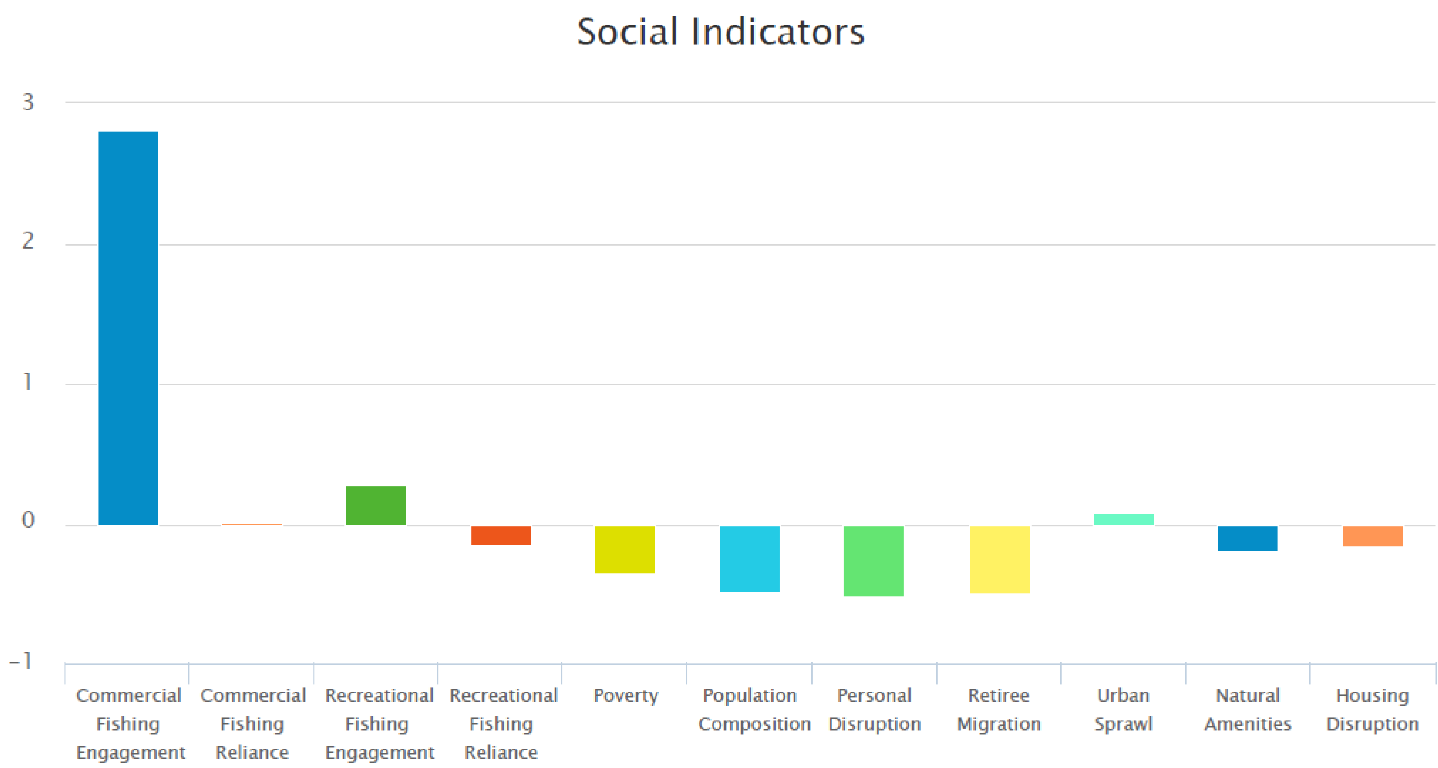

[1]The Census Bureau currently identifies two types of urban areas: urbanized areas of 50,000 or more people, and urban clusters of at least 2,500 and less than 50,000 people, both representing densely developed territory and encompassing residential, commercial, and other non-residential urban land uses. Rural areas are all those outside of urbanized areas and urban clusters. For more information see: **http://blogs.census.gov/2012/04/04/how-do-we- measure-urban-areas** and **http://www.census.gov/geo/www/ua/2010urbanruralclass.html#lists**.

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Newport, RI

Where is Newport located?

Newport is a town with a population of 24,672 and classified by the census as falling within an urbanized area. Rural to urban is really a continuum. Increasing urbanization indicates that a community has more jobs overall, more kinds of jobs, and more services like hospitals, social workers and job training centers.

However, increasing urbanization can also mean greater pressure to transform working waterfronts for alternative uses, such as hotels or tourist shops.[1]

Involvement in Fisheries

What species are landed in Newport?

The landings associated with a fishing community tell us what species are important to that community. The diversity of species caught also is indicative of a community's ability to adapt to changing environmental conditions (e.g. populations of specific fish stocks) or changes in fishing regulations that restrict access to resources.

*Groundfish includes cod, winter fl.,witch fl.,yellowtail fl., am.plaice, haddock, white hake,redfish, pollock.

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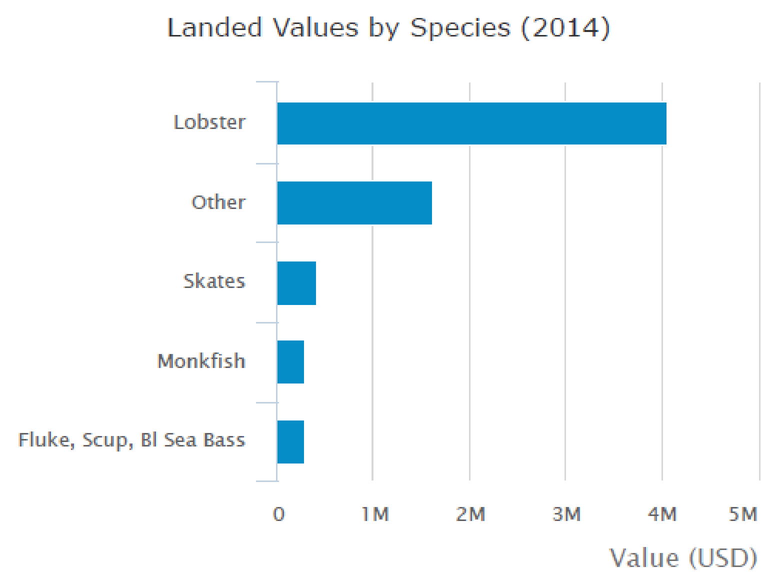

What are the characteristics of the fishing vessels in Newport?

The number of fishing vessels in a given port provides a sense of the scale of fishing in that port. Where a large port may serve as the homeport for hundreds of vessels, a smaller one may only have a handful. The number of vessels also may provide a rough sense of the number of fishing-related jobs (e.g. crew positions, jobs in shoreside industries) available in a given location.
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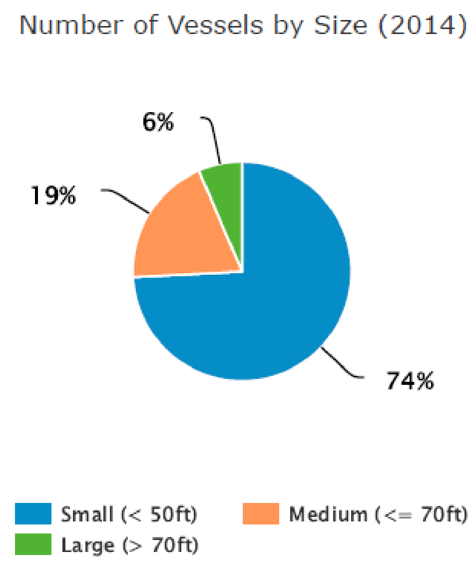

Apart from the lobster fleet, smaller boats also tend to catch a broader range of species where their larger counterparts are more specialized (e.g. limited access scallop boats and herring pair trawlers). All these characteristics help illuminate the potential impacts of regulatory changes on a given community.

Demographic Attributes

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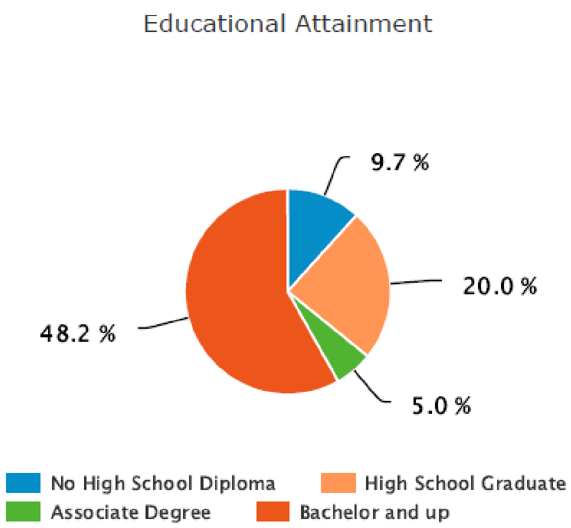
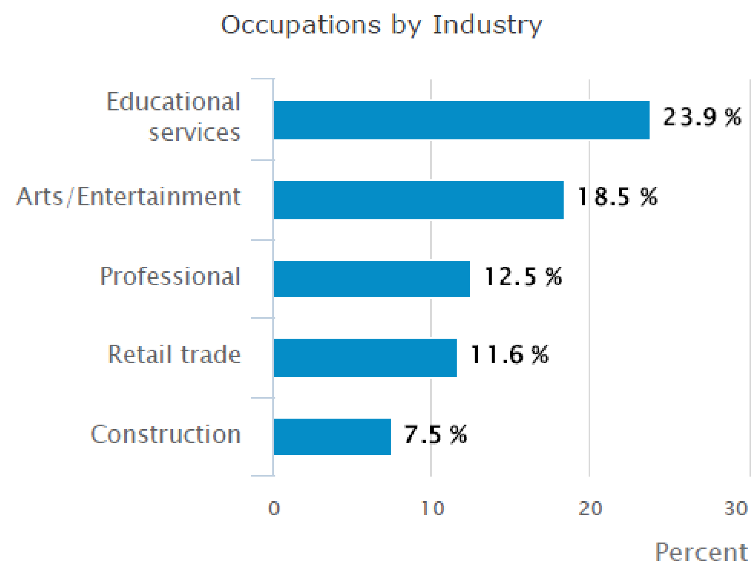


How do people make a living in Newport?

Just as the range of fish species harvested by town residents speaks to their ability to adapt to environmental change, the diversity in local occupations indicates the ability of a community to adapt to economic changes, including changes in the local fishing economy. Is there one predominant industry, for instance, or is there a range of economic opportunities? How many occupations are available that offer incomes similar to fishing or require skills and education common to the average fisherman? How many jobs are available that would provide a working environment that fishermen would be comfortable with?



Unemployment Rate: **2.2%**

National Rate: **7.9%***

The unemployment rate in a community is one indicator of the level of opportunity that may exist for fishermen who lose their jobs to find alternative ways of making a living. The unemployment rate may also indicate the desirability of fishing in the face of other opportunities.

*Source: U.S. Department of Labor, **Bureau of Labor Statistics**

Median Household Income: **$57,640.00**

National Average: **$51,914.00** (2011)

Individuals in Newport living in poverty: **10.2%** The poverty threshold for an individual is defined by the US Census for 2010 as $11,139. The percentage of a town's population living under this economic threshold is an indicator of the residents' ability to adjust to loss of income and job opportunities in fishing-related and other local industries.

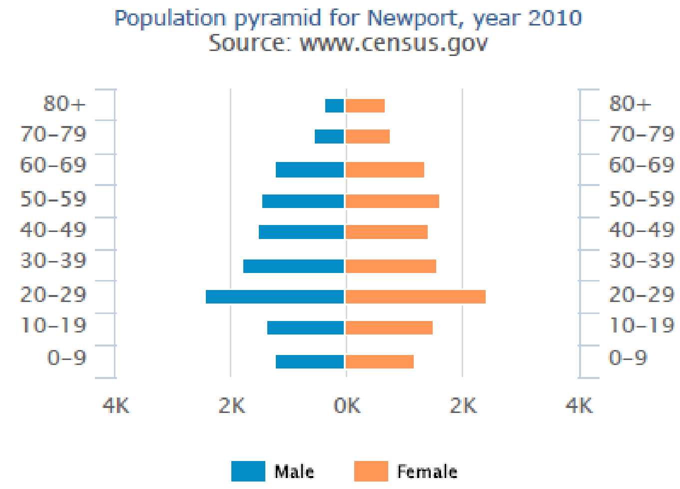
Age structure of residents

Age structure provides potential indications of many broader community issues and institutions. A large number of older residents may be associated with a retirement community or an out-migration of young people. For many fishing communities, an aging population can indicate gentrification, a process that may affect fishermen's access to the waterfront. In some remote coastal communities, people in their late teens or early twenties may leave to look for work or pursue an education outside of their community. A very large population of young people, on the other hand,

may indicate the presence of universities or a military base.

Median age: **36.4**

National median: **37.2**



Ethnicity and Race

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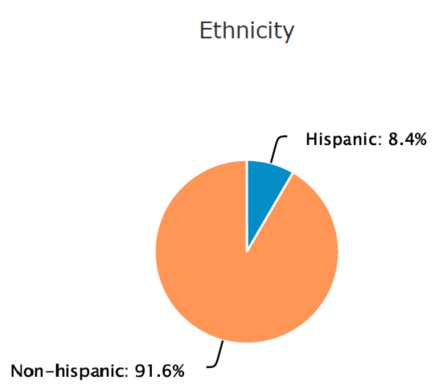

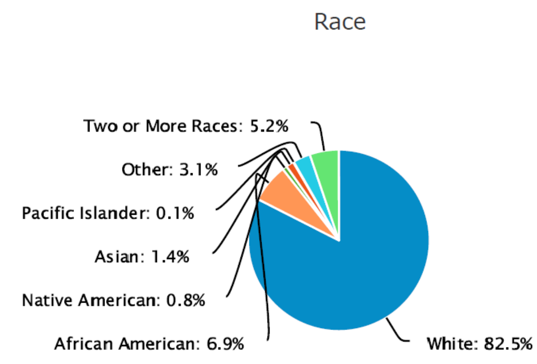

Language and Marginalization

Foreign Born: **7.6%**

Fishing regulations can be complex. Documents are rarely translated from English into other languages. Lack of strong English language skills could affect participants' ability to engage effectively in the fisheries management process. While these numbers correspond to the overall community in Newport they may indicate a population needing assistance in integrating their needs and concerns into the process.

National Average: **12.7%**

Speak English less than very well: **3.6%**

National Average: **8.7%**

Social Indicators

Social indicators are quantitative measures that describe the well-being of communities and are used to describe social phenomena over time. Below are a series of indices for Newport that provide measures of fishing engagement and reliance, and social vulnerability. An index combines variables of interest and are used to evaluate community well-being in terms of social, economic and psychological welfare.

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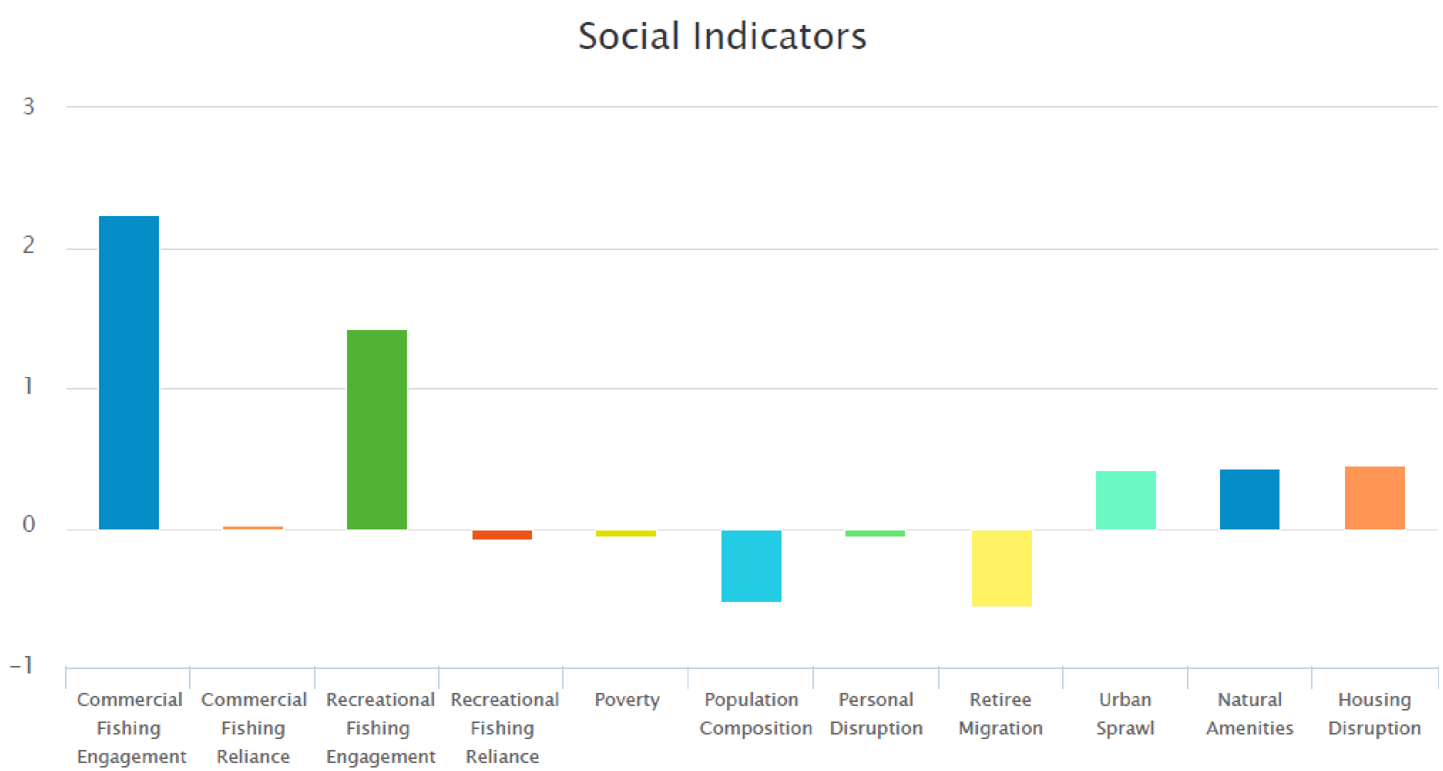

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CHAPTER 5 APENDICES

Appendix 5.1 Draft Technical Documentation for the Vertical Line / Co-Occurrence Model

Prepared for:

National Marine Fisheries Service
(NMFS), Greater Atlantic Regional
Fisheries Office (GARFO)
55 Great Republic Drive
NOAA Fisheries Service
Gloucester, MA, 01930

June 2020

Prepared by:

Industrial Economics, Incorporated
2067 Massachusetts Avenue
Cambridge, MA 02140
617-354-0074
www.indecon.com

1. INTRODUCTION

BACKGROUND

Commercial fishing gear can inadvertently pose a risk of entanglement to protected marine species, including whales. Along the Atlantic coast of the United States, the risk that whales may become entangled is of particular concern for four populations: the western North Atlantic stock of right whales; the Gulf of Maine stock of humpback whales; the western North Atlantic stock of fin whales; and the Canadian eastern coastal stock of minke whales. The effects of entanglement on members of these species can range from no permanent injury to serious injury or death.

Right whale and fin whale stocks are listed as endangered species under the Endangered Species Act (ESA); three species – Right, humpback, and fin whales – are protected under the Marine Mammal Protection Act (MMPA). Pursuant to the ESA and the MMPA, the National Marine Fisheries Service (NMFS) – with guidance from the Atlantic Large Whale Take Reduction Team (ALWTRT) – is responsible for the development and implementation of measures to reduce the risks of entanglement for these species. These measures are embodied in the Atlantic Large Whale Take Reduction Plan (ALWTRP). The Plan seeks to reduce the risks of entanglement through a set of gear modifications and other requirements that affect commercial fishing operations in Atlantic waters.

A continuing concern in the evolution of the ALWTRP is the risk of entanglement in vertical line; i.e., buoy lines associated with lobster trap/pot gear, other trap/pot gear, or gillnet gear. To better understand these risks and the potential impact of management measures designed to address them, NMFS requires information on the amount of vertical line used by various fisheries, as well the extent to which that line is fished in areas and during seasons in which whales are likely to be present.

The model described herein – the Vertical Line/Co-occurrence Model – draws on a variety of sources to assist both NMFS and the ALWTRT in their efforts to improve the effectiveness of the ALWTRP. The model, developed under contract to NMFS by Industrial Economics, Incorporated (IEc), is designed to address the following types of questions:

- Where do the fisheries that are subject to the requirements of the ALWTRP operate?
- Where are concentrations of vertical line the greatest?
- Do whales frequent areas with high concentrations of vertical line?

The model contains information on a wide range of fixed gear fisheries, including a number of gillnet fisheries, the American lobster fishery, the blue crab fishery, and other trap/pot fisheries. Through the integration of information on fishing activity and gear configurations, the model analyzes geographic and temporal variations in fishing effort and the distribution of fishing line in waters subject to the ALWTRP. The model also incorporates information on whale sightings and identifies areas and times at which whales and commercial fishing gear are likely to co-occur. The final product is a set of indicators that provide information on factors that contribute to the risk of entanglement at various locations and at different points in time.

Development of the model began in 2005; since then, NMFS has directed a series of expansions and improvements (see timeline below). This document describes the latest version of the model and the methods and data employed to support preparation of NMFS' current proposal to incorporate new requirements into the ALWTRP.[1]

DATA LIMITATIONS AND UNCERTAINTY

The objective of the ALWTRP is to reduce the number of large whales that die or suffer serious injuries as the result of incidental entanglement in commercial fishing gear. In light of this goal, it is important to emphasize that the model does not provide a basis for estimating the frequency with which entanglements may occur, nor does it provide a basis for estimating the probability that an entanglement will result in a serious injury or death. The risk of serious injury or mortality due to entanglements is likely to be a function of many factors. For example, the *probability* that an entanglement will occur may depend on the amount of gear deployed in a particular area, the number of whales that are present, whether the gear is actively tended, the behavior in which a whale is engaged when gear is encountered (e.g., whether the whale is feeding), or other factors. Similarly, the risk of injury or death *in the event of an entanglement* may depend on the characteristics of the whale involved (species, size, age, health, etc.), the nature of the gear (e.g., whether the gear incorporates weak links designed to help a whale free itself), human intervention (e.g., the feasibility or success of disentanglement efforts), or other variables. The interrelationships among these factors are not fully understood, and the data needed to provide a more complete characterization of risk are not readily available. In light of these limitations, the model does not attempt to predict the frequency or severity of entanglements. Instead, it provides relative indicators of (1) the potential for entanglements to occur at different times and locations and (2) the effect that new regulatory requirements may have on the potential for entanglements to occur. These indicators do not measure entanglement risks or changes in entanglement risks; however, they provide a relative sense of risks in different areas, as well as insight to the potential impact of alternative regulatory requirements on those risks.

In addition to the limitations noted above, the quality of the information the model provides is constrained by limitations in the data it employs. Because the data underlying the model were derived from disparate sources, including fishing reports, survey data, and expert judgment, it is not possible to generate statistical confidence intervals that characterize the uncertainty in the model's output. Nonetheless, it is important to recognize several key sources of uncertainty:

- **The model draws on multiple sources of data to characterize commercial fishing activity and gear use.** There is no single, uniform source of data on commercial fishing activity in waters subject to the ALWTRP. Permitting and reporting

[1] This documentation reflects updates to the Co-occurrence/Vertical Line Model carried out in support of ongoing NMFS rulemakings. The data and methods used to support the analysis of regulations enacted in 2014 and 2015 are addressed in "Draft Technical Documentation for the Vertical Line Model," Prepared for NOAA National Marine Fisheries Service by Industrial Economics, Inc., March 2014. The 2014 documentation provides outcomes of supplementary validation and sensitivity analyses conducted at the time in response to a Center of Independent Experts peer review. The 2020 documentation focuses on the current application of the model and does not recreate prior validation and sensitivity analyses. In addition, the 2014 documentation presents several appendices that, for reference, provide monthly baseline model outputs. The 2020 documentation provides several examples of baseline model outputs, but for brevity does not present the full suite of outputs.

requirements vary by political jurisdiction, with states regulating activity in state waters and NMFS regulating activity in Federal waters. As a result, the available data on commercial fishing activity vary considerably across jurisdictions.

- **Data on fishing activity and gear configurations in state waters vary in specificity and quality.** IEc and NMFS worked directly with state marine resource officials to develop defensible modeling assumptions for vessels fishing exclusively in state waters. For some states, key activity and gear configuration parameters are estimated based on reporting data (e.g., logbook data) submitted by fishermen in accordance with state requirements. For others, surveys are the primary source of this information. In some cases, these surveys are one-time efforts, while others are administered annually (e.g., recall surveys). Finally, for some states, the characterization of fishing activity is based upon the professional judgment of state fisheries experts. In several cases, the data are taken from a mix of sources (e.g., surveys and best professional judgment). Section 4 describes the data and processes employed to develop the key fishing parameters for each state covered in the model.
- **Federal lobster permits currently impose no trip reporting requirements.** Unlike Federal permits for other commercial fisheries, Federal lobster permits do not require their holders to report the location of fishing activity; as a result, information on the location of trips taken by vessels that hold Federal lobster permits is limited to those that also hold permits for other fisheries (these vessels must report the location of all fishing activity). In the absence of better data, the current version of the model employs several approaches to estimate the number of lobster vessels fishing in Federal waters, based on recommendations provided both by state fisheries administrators and the Northeast Fisheries Science Center (NEFSC). These revisions improve the temporal and geographic resolution of the model's characterization of lobster fishing activity in Federal waters; however, the absence of trip report data remains an important source of uncertainty, particularly in LMA 1, where the majority of non-reporting vessels operate. Section 4 provides details on the model's revised approach to characterizing the activity of Federal lobster vessels.
- **Sightings Per Unit Effort (SPUE) data provide a limited basis for characterizing the distribution of whales.** The model relies on effort-corrected sightings data to characterize the likely distribution of whales within the waters that are subject to the ALWTRP. The dataset, however, is neither geographically nor temporally comprehensive, adding uncertainty to the analysis of both baseline co-occurrence scores and the impact of alternative management measures. In particular, uncertainty arises from the inclusion of SPUE values in areas or at times with very low survey effort, as well as from the absence of SPUE values (and therefore, co-occurrence values) in areas or at times for which effort-adjusted survey data are unavailable. In addition, other sources of information (e.g., acoustic data or data on habitat conditions, such as the presence of prey species) suggest that whales may be present in places and

at times at which no sightings have been recorded. Thus, the SPUE data are both an incomplete and imprecise indicator of the distribution of whales. Section 2 provides additional detail on the SPUE data.

- **The geographic precision of the model's presentation of co-occurrence scores may be overstated.** As described in greater detail in Section 3, the model employs effort-corrected whale sightings information and estimates of the concentration of vertical line in an area to generate a co-occurrence score. These scores are assigned on a discrete basis to individual grid cells; this may imply a higher degree of geographic precision in characterizing the potential for an entanglement than the underlying data support.

VALIDATION OF GEAR CONFIGURATION ASSUMPTIONS

As discussed in detail in Section 4, the model employs a range of assumptions on the configurations of gear used in ALWTRP-regulated fisheries to estimate the number of buoy lines in the water column. IEc reviewed its assumptions on gear use with representatives of state fisheries management agencies, NEFSC, NMFS gear experts, and fishermen on the ALWTRT. In addition, IEc shared its assumptions in writing and through multiple presentations to the ALWTRT and the Atlantic States Marine Fisheries Commission (see the timeline below) so that all participants were given the opportunity to review and comment. Commenters' suggestions were taken into account in subsequent revisions to the gear configuration assumptions.

DEVELOPMENT TIMELINE

IEc began development of the Vertical Line Model in 2005. Since then the model has undergone numerous updates and revisions, many of which reflect the guidance and assistance of the ALWTRT. Members of the TRT provided information on fishing activity and gear configurations employed within state waters, as well as available data on sightings of endangered whales. Below, we present a brief timeline of the model's development, including formal presentations to the full TRT or its subgroups.

2005 - 2009. Initial methods development, working prototype, and data collection.

- Created working prototype focused on Federal vessel activity in the Northeast for 2004.
- Presented methods and preliminary findings to ALWTRT in December 2006.
- Improved the characterization of commercial fishing activity and gear use.
- Updated the model to include federally permitted activity for 2005 and 2006.
- Incorporated data on State-permitted activity in the Northeast and Mid-Atlantic, and refined assumptions on gear configurations in Northeast State waters.
- Incorporated preliminary data on whale sightings for the Northeast.
- Presented expanded model to the ALWTRT in April 2008.
- Expanded the model to include fishing activity and gear configuration data for the

Southeast (includes Federal and State waters).

- Presented updates to the model, along with requests for improved State data at separate Northeast and Mid-Atlantic/Southeast ALWTRT Subgroup meetings in April 2009.

2010. Co-occurrence indicator and scenario generator development.

- Developed distributional approach to characterize gear configurations in key Northeast states.
- Refined co-occurrence indicator using a preliminary effort-adjusted whale sightings dataset.
- Developed the capability to evaluate potential management scenarios, including closures.
- Produced draft model documentation.
- Presented a full accounting of the 2008 baseline, including an in-depth methods discussion, along with NMFS' straw man proposal at separate Northeast (November 2010) and Mid- Atlantic/Southeast ALWTRT Subgroup meetings (April 2011).

2011 – 2012. Proposal analysis and documentation.

- Worked directly with the ALWTRT's Northeast working group to evaluate and improve the model's methods and data sources.
- Incorporated coast-wide effort-adjusted sightings data provided by the North Atlantic Right Whale Consortium, based on recommendations from ALWTRT.
- Presented updated methods and results to ALWTRT, including 2009/2010 baseline and analysis of vertical line management proposals in January 2012.
- Presented analysis of revised vertical line management proposals in April 2012.
- Submitted draft documentation for peer review in June 2012.
- Peer review reports received November 2012.

2013 – 2015. Finalization of baseline and alternatives for DEIS and FEIS associated with NMFS' vertical line rulemaking.

- Updated baseline state and Federal fishing activity and gear configuration data to 2011 (where available).
- Refined gear configuration assumptions for the other trap/pot fisheries based on interviews with state officials and NMFS gear team.
- Developed sensitivity analysis to address TRT/peer review concerns regarding uncertainty in the effort-adjusted whale sightings dataset.
- Updated documentation to reflect changes in the baseline and clarify issues raised in the peer review.
- Developed DEIS/FEIS alternatives for the 2014 rulemaking and subsequent amendments.

2016 – 2017. Updated platform and preliminary 2016 baseline.

- Transitioned the model from ArcGIS / MS Access to an open-source web-based platform, improving performance, flexibility, and scalability.
- Updated baseline state and Federal fishing activity and gear configuration data to 2016 (where available) to test the new platform.
- Updated NARWC effort-corrected and opportunistic sightings to data, as available.
- Conducted extensive testing using the new platform and preliminary data, adjusting where necessary.
- Presented preliminary 2016 baseline findings as part of NMFS discussions with the ALWTRT in October 2018.

2018 - 2020. Finalized 2017 baseline for use in the DEIS associated with NMFS's forthcoming ALWTRP rulemaking.

- Updated baseline state and Federal fishing activity and gear configuration data to 2017 (where available).
- Provided updated 2017 baseline to the Atlantic States Marine Fisheries Commission Lobster Plan Development Team (PDT) and the Northeast Fisheries Science Center (NEFSC) for review and comment.
- In response to comments from the PDT and NEFSC, updated approach to calculating vertical lines in Northeast Nearshore waters and Offshore waters.
- Updated NARWC effort-corrected and opportunistic sightings data to incorporate sightings through 2018.
- Participated in peer review conducted for NEFSC's Decision Support Tool.
- Employed the revised model to support the development of NEFSC's Decision Support Tool and the DEIS alternatives for the 2020 rulemaking.

2. SCOPE OF THE MODEL

SOFTWARE

The Vertical Line/Co-occurrence Model resides on a combined platform, utilizing free, open source options wherever possible. The current model employs PostGreSQL 9 as the primary database, Pentaho Data Integration tools for modeling, and a combination of Pentaho Community Tools, Geoserver, and Open Layers for web-based mapping and visualization. Map images can be imported into Microsoft PowerPoint or other software to create animations demonstrating changes in indicators over time.

GEOGRAPHIC AND TEMPORAL SCOPE

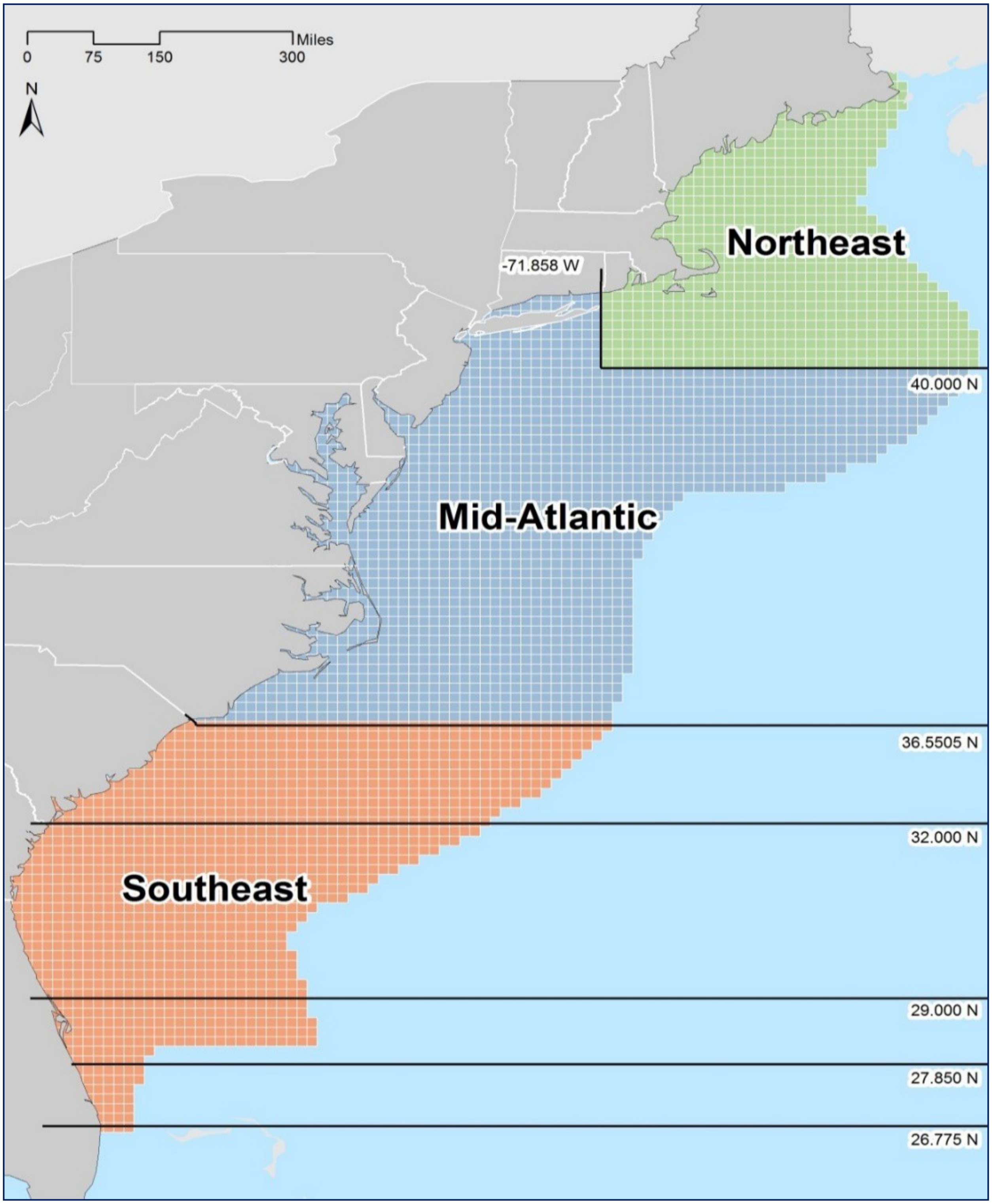
The model analyzes all the commercial fisheries subject to the ALWTRP, including those operating in the Northeast Atlantic, Mid-Atlantic, and Southeast Atlantic. The geographic range of the model mirrors that of the ALWTRP: it extends from the Canadian border to southeast Florida (at 26 degrees 46.5 minutes N latitude), and includes all Atlantic waters within the limits of the United States' Exclusive Economic Zone (EEZ). [2]

To facilitate the integration of data on fishing activity, gear configurations, and whale sightings, the model analyzes information on a common spatial grid, with consistent positioning and resolution (i.e., cell size). It employs two spatial grids for analysis. The model analyzes fishing activity and gear distribution on a one-minute grid. This allows the model to delineate activity within relatively small fishing areas, such as state fishing zones. For mapping purposes, fishing activity and gear distribution are aggregated to a standardized ten-minute grid, which matches the grid cell size used to develop the effort- adjusted whale sightings data. Likewise, the co-occurrence indicator is presented at the ten-minute grid cell level. Exhibit 1 illustrates the geographic scope of the model, displayed on a 10-minute grid.

The model baseline currently incorporates data on fishing activity in Federal waters for 2017, representing the most recent period for which IEc conducted data collection on commercial fishing activity. Because states have differing data collection programs that have evolved over time, the availability of data characterizing fishing in state waters varies by state. At minimum, the model incorporates state data that characterize vessel activity from 2015 through 2017; many states have provided data from prior years. Section 4 describes the data provided by each state in greater detail.

[2] The model's geographic range includes certain inshore waters currently exempted from some or all requirements of the ALWTRP.

EXHIBIT 1 . GEOGRAPHIC SCOPE OF THE VERTICAL LINE MODEL



COMMERCIAL FISHERIES

To account for differences in fishing practices and to allow for more detailed analysis of results, the model treats the lobster, gillnet, blue crab (south of the Delaware/New Jersey border), and other trap/pot fisheries as distinct groups. For each group, IEc collected spatially explicit data on fishing activity and the configuration of gear employed by fishing vessels. Exhibit 2 summarizes the fisheries considered in the model.

EXHIBIT 2 . FISHERIES ANALYZED IN THE VERTICAL LINE MODEL

GROUP	CORRESPONDING ALWTRP FISHERY	PERIOD OF ACTIVITY
Lobster	Northeast/Mid-Atlantic American lobster trap/pot	Year-round
Gillnet	Northeast sink and anchored float gillnet fisheries	Year-round
	Mid-Atlantic gillnet fishery	Year-round
	Southeast sink and anchored gillnet fisheries	Varies
Blue Crab	Mid-Atlantic/Southeast blue crab fishery	Varies
Other trap/pot	Atlantic other trap/pot fisheries (includes blue crab in the Northeast)	Varies

Note: The model currently excludes Northeast drift gillnet vessels.
Source: Department of Commerce, National Oceanic and Atmospheric Administration. January 2010. Guide To The Atlantic Large Whale Take Reduction Plan. Available at https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal- protection/atlantic-large-whale-take-reduction-plan.

WHALE SIGHTINGS

NARWC SPUE Data

As with other datasets used in the model, IEc worked with the ALWTRT to identify data that describe the distribution of large whales in the waters subject to the ALWTRP. Based on the recommendations of the TRT, IEc worked with the North Atlantic Right Whale Consortium (NARWC) to obtain an amalgamated dataset derived from shipboard and aerial surveys to characterize the seasonal distribution of right whales, humpback whales, and fin whales. These data are adjusted for the level of effort employed to locate whales from the air and sea, providing an indication of sightings per unit of survey effort (SPUE). The TRT identified these surveys as the best available information on the distribution of large whales in the Atlantic.

The NARWC SPUE dataset includes information obtained from surveys conducted between October 1978 and December 2018. Appendix A lists the sources of the SPUE data, which include both aerial and shipboard track surveys. To be included in the NARWC dataset, a survey must:

- Provide sufficient records of the survey platform's time and position to reconstruct its trackline;
- Have been conducted with at least one trained observer who recorded periods of dedicated observation or no observation;

- Report the whale species, group size, and position for each sighting; and
- Provide data on sightings conditions.

The records included from each survey in the dataset include only those which meet the NARWC's minimum standards for acceptable sightings conditions; i.e., visibility of at least two nautical miles, a sea state of Beaufort 4 or lower, and, for aerial surveys, a maximum altitude of no greater than 1,200 feet. The dataset includes only sightings of live whales, and excludes all records in which the identification of the species is uncertain.

The NARWC SPUE dataset aggregates the following fields by 10-minute grid cell and month:

- Effort, defined as the total kilometers surveyed;
- Sightings, defined as the total number of individuals of each species observed;
- SPUE, in units of whales (separated by species) per 1000 kilometers of valid effort (calculated as 1000*[Sightings/Effort]).

The model can further aggregate the sightings data, producing combined SPUE datasets that sum across all or a subset of the whale species within each grid cell and month. Users may employ these values in developing the Whale Sightings and Vertical Line Co-Occurrence Indicator (see below). Exhibit 3 presents maps that illustrate average monthly SPUE values for the Northeast, indexed on a scale of 0 to 1000.[3] Monthly scores can be viewed for a specific year or as the cumulative aggregation of multiple months and years, as selected by the user. Using this functionality, the model can produce monthly or seasonal maps of SPUE values for all three regions: Northeast, Mid-Atlantic, and Southeast.

Limitations of the NARWC SPUE Data

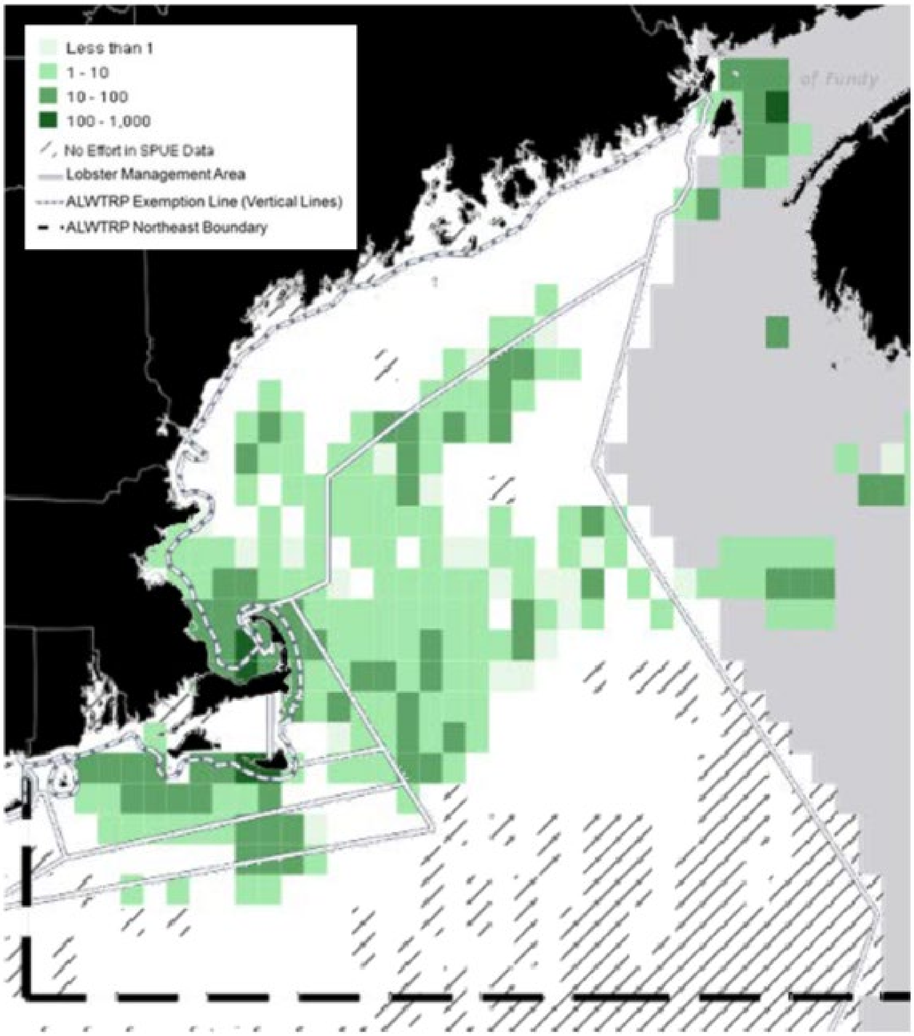
The NARWC SPUE dataset is subject to a number of limitations. For example, the dataset gives equal weight to sightings reported from survey platforms – airplanes and ships – that are known to differ with respect to search efficiency. Similarly, the dataset does not adjust SPUE values to account for variation in search efficiency across species within a platform; in the case of NEFSC aerial surveys, the estimated effective width of a survey track ranges from approximately 0.8 nautical miles for humpback whales to approximately 1.0 nautical mile for right whales and 1.4 nautical miles for fin whales. Failure to account for these differences is a source of imprecision in the model's characterization of the seasonal distribution of whales.

A potentially more significant issue is that the NARWC SPUE dataset is neither geographically nor temporally comprehensive, adding uncertainty to the analysis of co-occurrence. This uncertainty arises from the inclusion of SPUE values in areas or months with very low survey effort, as well as from the absence of SPUE values (and therefore, co-occurrence values) in

[3] The model also allows users to view opportunistic sightings data, as reported in the NARWC database. Raw sightings data from the NARWC database are strictly observational; they are not effort-adjusted and the management documents in which they are used are not peer-reviewed. Distributional patterns based on these data are likely to be biased by where, and when, surveys were conducted. We include the raw NARWC sightings data in the model primarily for reference purposes.

areas or months for which effort- adjusted survey data are completely unavailable. In addition, other sources of information (e.g., acoustic data) indicate that whales may be present in places and at times at which no sightings have been recorded. Thus, the SPUE data are both an incomplete and imprecise indicator of the distribution of whales.[4]

EXHIBIT 3 . NARWC SPUE SCORE (NORTHEAST CUMULATIVE ALL MONTHS 2010 - 2018)



INDICATORS OF FISHING ACTIVITY AND POTENTIAL RISK OF ENTANGLEMENT

The model generates four indicators to describe fishing activity and the potential for interactions between large whales and fishing gear.

[4] In developing the prior version of the model, members of the ALWTRT and peer reviewers encouraged an attempt to evaluate the sensitivity of the model's findings to the most critical limitations in the SPUE data. In response to this concern, IEc developed an analysis that examines the sensitivity of baseline co-occurrence scores to alternative assumptions about the presence of whales in areas or at times for which SPUE data are not available, or may be too limited to be reliable. Appendix C of the model's 2014 documentation presents the results of this analysis. We did not repeat this analysis for this latest model update, as we anticipate similar results. See "Draft Technical Documentation for the Vertical Line Model," Prepared for NOAA National Marine Fisheries Service, Industrial Economics, Inc., March 2014.

- **Number of Active Vessels** – Using Federal and state data sources, the model estimates the number of commercial fishing vessels that participate in each fishery. The methods employed to estimate the number of active vessels vary by location and fishery.
- **Number of Vertical Lines** – Based on the number of active vessels and data on typical gear configurations (e.g., the number of vertical lines employed per vessel), the model estimates the number of vertical lines employed by each fishery.[5]
- **Length of Groundlines** – Using similar information, the model can estimate the total length of groundline (i.e., fishing line linking traps to traps and/or traps and gillnets to anchors) in the water.[6]
- **Whale Sightings and Vertical Line Co-Occurrence Indicator** – As a relative measure of the potential for an entanglement to occur, the model combines effort-adjusted whale sightings information with estimates of the number of vertical lines in the water at a particular location and time. The co-occurrence indicator can be generated for each whale species (right, humpback, and fin) or for any combination of the three.

Section 3 provides an overview of the methods employed to produce these indicators. Section 4 provides descriptions of the specific methods and data sources used to develop estimates of the number of active vessels and vertical lines in specific areas.

[5] Since vertical lines span the entire water column, from the surface to the ocean floor, the model assumes that the frequency of whale interactions with vertical lines is not influenced by the length of the line in the water column. The length of vertical line in the water can be estimated using bathymetry data that has been aggregated into the model's grid structure.

[6] As groundline has not been the recent focus of the ALWTRT, the functionality of this aspect of the model has not been recently updated. When the model was initially developed, the TRT was briefed on the methods and data sources used to estimate the length of groundline in the water.

3. OVERVIEW OF METHODS AND BASELINE RESULTS

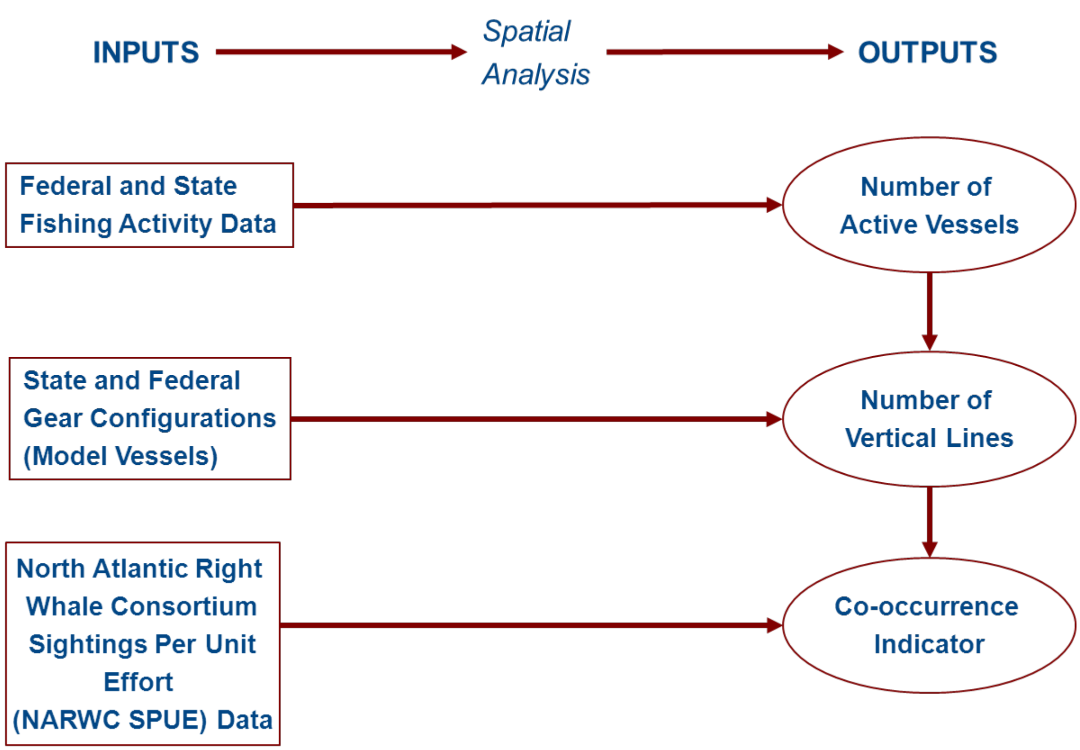
INTRODUCTION

This section presents a general overview of the Vertical Line/Co-occurrence Model and the calculations used to estimate the indicators discussed in Section 2. It also briefly describes the model's scenario building and reporting capabilities.

CONCEPTUAL OVERVIEW

Exhibit 4 presents a conceptual representation of the Vertical Line/Co-occurrence Model. The model develops spatially explicit monthly estimates of each indicator. Using Federal and state data describing fishing effort and location, the model first estimates the number of vessels operating in each grid cell each month. The model then combines the number of active fishing vessels and information on vessel gear configurations to generate monthly estimates of the number of vertical lines and the length of groundline within each cell. Finally, the model combines the vertical line estimate with the effort-adjusted NARWC whale sightings data to produce the combined whale-vertical line co-occurrence indicator. Below, we detail the general approach used to estimate each indicator.

EXHIBIT 4 . CONCEPTUAL DIAGRAM OF THE VERTICAL LINE/CO- OCCURRENCE MODEL



NUMBER OF ACTIVE VESSELS

Based on GIS layers provided by NMFS and state fisheries administrators, the model assigns each 1- minute grid cell either to a particular state's jurisdiction or to one of several Federal fishery management zones. Where data permit, grid cells in state waters are assigned to appropriate state management areas (e.g., Massachusetts Division of Marine Fisheries Statistical Reporting Areas) and are demarcated as exempt or non-exempt waters based on the ALWTRP exemption line established in the 2014/2015 rulemaking. Grid cells in Federal waters are delineated by Lobster Management Zone, NMFS Statistical Area, and/or ALWTRP trap/pot areas, including Northern Nearshore, Southern Nearshore, and Offshore waters. [7]

Using data on fishing effort from a variety of sources, including the Northeast Vessel Trip Report (VTR) system, NMFS' Northeast Permit database, the Southeast Logbook, state reporting programs, and judgments from NMFS gear experts and state fisheries administrators, IEc has developed area-specific methods to generate monthly estimates of the number of vessels that are active within Federal and state management zones. Section 4 details the management zones and approaches employed. Exhibit 5 provides the current baseline estimates of the number of active vessels by ALWTRP region, month, and fishery (includes exempt waters).

EXHIBIT 5 . 2017 BASELINE ESTIMATES - NUMBER OF ACTIVE VESSELS

FISHERY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NORTHEAST												
Lobster	1,653	1,062	1,107	1,777	2,791	3,938	5,220	5,442	5,199	4,839	4,125	2,770
Gillnet	39	33	31	69	95	157	196	168	148	120	62	48
Other Trap/Pot	6	6	3	21	81	94	138	113	123	125	91	53
Total	1,698	1,101	1,141	1,866	2,967	4,189	5,553	5,723	5,470	5,084	4,279	2,871
MID-ATLANTIC												
Lobster	56	36	49	86	152	203	197	167	131	107	106	86
Blue Crab	2	0	307	783	1,151	1,243	1,341	1,303	1,166	868	480	28
Gillnet	214	305	386	395	290	195	160	210	302	378	379	268
Other Trap/Pot	60	48	48	115	113	110	105	90	125	127	132	83
Total	332	388	790	1,379	1,706	1,751	1,803	1,770	1,725	1,480	1,097	465
SOUTHEAST												
Blue Crab	238	243	264	262	256	247	229	220	222	223	209	200
Gillnet	6	4	8	15	8	8	4	4	10	14	21	12
Other Trap/Pot	7	8	5	7	5	5	2	0	0	1	3	3
Total	251	255	277	284	269	260	235	224	232	238	233	215
Total	**2,281**	**1,745**	**2,208**	**3,530**	**4,941**	**6,199**	**7,591**	**7,716**	**7,427**	**6,802**	**5,608**	**3,551**

[7] Grid cells that overlap two or more management zones are assigned to the zone that accounts for the greatest share of the cell's total area.

NUMBER OF VERTICAL LINES AND LENGTH OF GROUNDLINE

Model Vessel Development

Given the broad scope of the ALWTRP, a vessel-by-vessel analysis of fishing gear and location is infeasible. Instead, the model is based upon the development of a set of model vessels, each of which represents a group of vessels that are likely to share similar operating characteristics. As currently configured, the model draws on nearly 220 individual model vessels to characterize gear use under baseline conditions. The model designates one or more model vessels for a suite of regions, including:

- Lobster Management Areas (LMAs);
- ALWTRP trap/pot areas;
- Federal waters off the coast of Maine delineated by distance from shore;
- Federal waters off the coast of Massachusetts and Rhode Island;
- State waters (exempt and non-exempt from the 2014/2015 Vertical Line rule); and
- State management areas (where available).

The maps in Appendix B provide the geographic location of the model vessel regions employed in the model.

Lobster, Blue Crab, and Other Trap/ Pot Model Vessel Calculations

For each lobster, blue crab, or other trap/pot model vessel, the model allows the user to specify the following gear configuration parameters for each month:

- Total traps fished;
- Number of traps per trawl;
- Number of endlines (i.e., buoy lines) per trawl;
- Length of groundline between traps (in feet);
- Number of anchors per trawl; and
- Length of anchor lines (in feet).

Using these inputs, the model employs the equations specified in Exhibit 6 to calculate the number of vertical lines and length of groundline associated with each model vessel.

EXHIBIT 6 . METHOD FOR ESTIMATING QUANTITY OF GEAR USED BY LOBSTER, BLUE CRAB, AND OTHER TRAP/ POT VESSELS

$$\mathit{Number\ of\ Vertical\ Lines} = \frac{\mathit{Total\ Traps\ Fished}}{\mathit{Traps\ per\ Trawl}} \times \mathit{Endlines\ per\ Trawl}$$

$$\begin{matrix}\mathit{Length\ of}\\ \mathit{Groundline}\end{matrix} = \frac{\mathit{Total\ Traps\ Fished}}{\mathit{Traps\ per\ Trawl}} \times \left[\left((\mathit{Traps\ per\ Trawl} - 1) \times \begin{matrix}\mathit{Length\ of}\\ \mathit{Groundline}\\ \mathit{between\ Traps}\end{matrix}\right) + \left(\begin{matrix}\mathit{Anchors\ per}\\ \mathit{Trawl}\end{matrix} \times \begin{matrix}\mathit{Length\ of}\\ \mathit{Anchor\ Lines}\end{matrix}\right)\right]$$

Gillnet Model Vessel Calculations

For each gillnet model vessel, the model allows the user to specify the following gear configuration parameters for each month:[8, 9]

- Total Strings Fished;
- Endlines per String;
- Number of Anchors per String; and
- Length of Anchor Lines.

Using these inputs, the model employs the equations specified in Exhibit 7 to calculate the number of vertical lines and length of groundline associated with each model vessel.

EXHIBIT 7 . METHOD FOR ESTIMATING QUANTITY OF GEAR USED BY GILLNET VESSELS

$$\mathit{Number\ of\ Vertical\ Lines} = \mathit{Total\ Strings\ Fished} \times \mathit{Endlines\ Per\ String}$$

$$\mathit{Length\ of\ Groundline} = \mathit{Total\ Strings\ Fished} \times \mathit{Anchors\ Per\ String} \times \mathit{Length\ of\ Anchor\ Lines}$$

[8] For use in potential revisions to the model, when possible, IEc also collected information on the number of net panels per string, the height and length of the net panels, and the length of the line between the net panels. Currently, these values are not used in the calculations described above.

[9] While wet storage of gear subject to the ALWTRP is prohibited, trap/pot gear generally remains in the water as long as it is being actively fished – in some cases, year-round. In contrast, gillnet gear may be fished in an area for as little as a few hours. Since the potential for whales to encounter gear depends in part on the duration of time the gear is deployed, the Vertical Line Model initially was designed to take variation in soak time into account in characterizing the concentration of vertical line in an area during a particular month. At the December 2010 meeting of the ALWTRT's Northeast Subgroup, the team raised concerns about the adequacy of the approach employed to determine and adjust for soak time. IEc received suggestions on alternative methods; however, consensus on a specific method was not reached. The team requested that IEc conduct a model run to test the impact and importance of the soak time assumption. IEc conducted the test assuming that vertical line from gillnets would remain in the water for the entire month. The test showed that this assumption resulted in a small increase in the estimate of the total number of lines deployed (0.07 to 0.4 percent, depending on the month). The results proved to be relatively insensitive to the treatment of gillnet soak time because the overall figure is driven primarily by the use of vertical line in trap/pot fisheries. Given this finding, the working group assigned to examine the issue determined that soak time was not of sufficient importance to warrant further analysis or more detailed treatment in the model.

Indicator Development

To estimate the total number of vertical lines in the water, the model considers each fishery group (i.e., lobster, gillnet, blue crab, other trap/pot) independently. Users have the option to view results for each group separately or as the sum of all four groups. For each group the model first estimates the average number of vertical lines per grid cell, based on the model vessels assigned to that grid cell. Where data permit (see Section 4 below for more detail), several model vessels may be assigned to the same grid cell. In these cases, each model vessel represents the percentage of vessels within the grid cell that operate with its particular configuration. This effectively allows for the development of weighted average estimates for the number of vertical lines in a given grid cell. We present example calculations below.

- Activity within a one-minute grid cell during a specific month is represented by model vessels A, B, and C.
- The number of vertical lines deployed by these model vessels in a specific month is 200, 100, and 80, respectively.
- The share of vessels fishing with each configuration is estimated as 50 percent, 30 percent, and 20 percent, respectively.
- For this grid cell and month, the model would estimate a weighted average of 146 vertical lines per vessel ([200 * 0.5] + [100*0.3] + [80*0.2]).[10]

Exhibit 8 provides the current baseline estimates of the number of vertical lines by ALWTRP region, month, and fishery (includes exempt waters).

To estimate the total length of groundline in the water, the model employs the same approach described above for vertical lines, but uses the length of groundline estimates developed for each model vessel.

COMBINED WHALE SIGHTINGS AND VERTICAL LINE INDICATOR (CO- OCCURRENCE)

As a relative indicator of the potential for whale entanglement in commercial fishing line, the model combines effort-adjusted whale sightings information provided by NARWC with estimates of the number of vertical lines in the water at a particular location and time. [11] To facilitate presentation and interpretation of the co-occurrence indicator, the underlying vertical line and whale sightings measures are indexed on a scale from 0 to 1,000.[12] For each grid cell, the indexed values are then multiplied to generate a combined indicator score, which may range in value from zero to 1 million.[13] Based on the grid cell size used to develop the effort-corrected whale sightings data, the co-occurrence indicator is presented at the ten-minute grid cell level.[14] Exhibit 9 maps cumulative co-occurrence in the Northeast using indexed Right whale SPUE from 2010 to 2018 and the current baseline number of vertical lines.

[10] In several Northeast states (see Section 4), the data allow us to delineate distributions of model vessels based on traps per trawl and traps fished. The calculations employed to estimate the number of vertical lines across these distributions are the same as those described in this example, with the primary difference being a larger number of model vessels assigned to individual areas.

EXHIBIT 8 . 2017 BASELINE ESTIMATES - NUMBER OF VERTICAL LINES

FISHERY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
NORTHEAST												
Lobster	186,440	121,094	119,761	212,947	381,881	578,053	844,079	929,582	915,911	871,298	657,585	338,494
Gillnet	815	396	306	814	1,308	3,614	5,780	4,980	4,366	3,202	1,569	1,313
OTP	131	135	50	696	3,103	3,267	4,135	3,052	3,756	4,303	3,464	1,920
Total	187,386	121,625	120,117	214,457	386,292	584,933	853,994	937,614	924,033	878,802	662,618	341,727
MID-ATLANTIC												
Lobster	4,422	2,669	4,049	6,715	9,409	12,877	12,847	11,155	8,279	6,578	6,631	5,929
Blue Crab	342	0	66,975	170,984	251,394	275,300	297,413	287,452	257,676	197,146	113,517	7,448
Gillnet	1,499	2,091	2,858	3,008	1,924	1,214	994	1,292	2,031	2,477	2,500	1,954
OTP	4,495	3,008	3,519	11,284	11,036	8,119	7,229	6,602	9,848	10,812	14,277	7,939
Total	10,759	7,768	77,401	191,991	273,763	297,511	318,483	306,501	277,834	217,013	136,925	23,269
SOUTHEAST												
Blue Crab	22,979	23,261	25,323	26,322	25,810	25,252	23,341	22,199	22,579	22,655	21,072	20,023
Gillnet	18	12	24	49	27	24	12	12	30	42	63	36
OTP	2,460	2,833	1,674	2,435	1,497	1,624	718	0	0	298	934	934
Total	25,457	26,106	27,021	28,806	27,334	26,900	24,072	22,211	22,609	22,995	22,069	20,993
Total	223,602	155,498	224,540	435,254	687,389	909,344	1,196,548	1,266,326	1,224,476	1,118,811	821,612	385,989

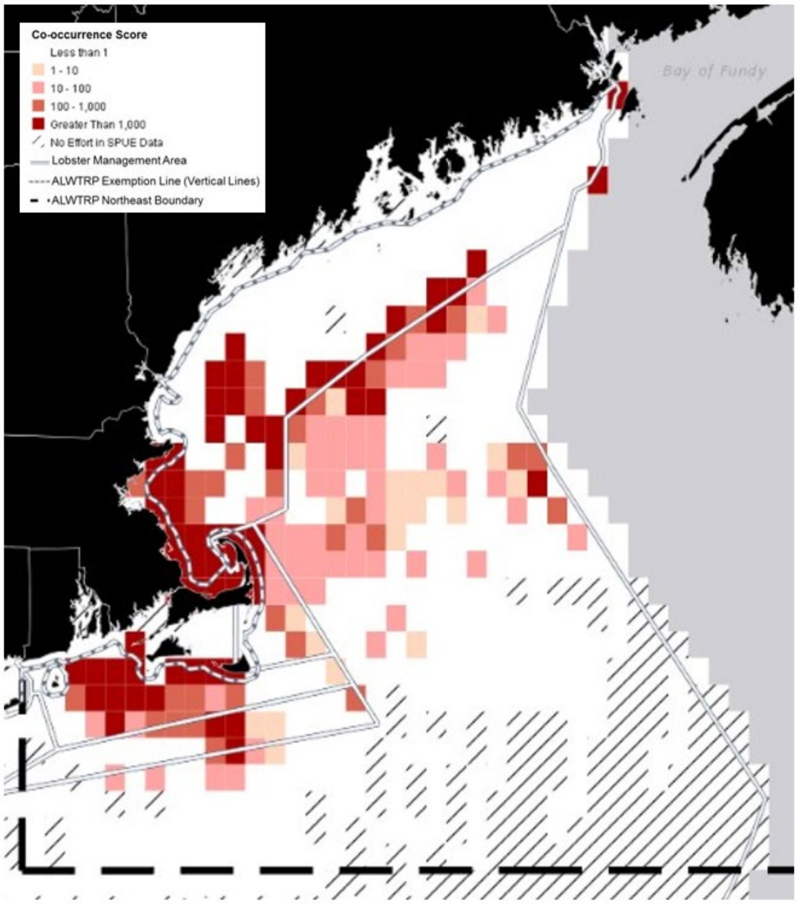
[11] The vertical line component of the combined indicator reflects the sum of the number of vertical lines estimated across the fishery groups (i.e., lobster, gillnet, blue crab, and other trap/pot).

[12] Specifically, for each measure, the highest value identified across all months and grid cells is set to 1,000. Other grid cell values are then indexed to the scale by dividing by the highest value and multiplying by 1,000. At the recommendation of the NEFSC, we updated the approach to account for outliers (extremely high values) that may occur as result of extremely low effort in a cell (defined as less than one kilometer). To account for this, the model assigns 1,000 to the grid cell with next highest value where the effort is greater than one kilometer.

[13] As stated above, users may view monthly maps of the NARWC's effort-corrected whale sightings information. This information is indexed on a 0 to 1,000 scale.

[14] It is important to note that the method described assigns a co-occurrence score of zero whenever the vertical line score or SPUE score is zero. While this is conceptually appropriate – there is no potential for whales to interact with vertical line where whales are not present or when gear is absent – it has nonetheless raised concern among some members of the ALWTRT that it provides a misleading characterization of risk. This concern stems from the understanding that to date, effort to survey the Atlantic coast for the presence of whales is in some areas inadequate to provide a reliable portrayal of their seasonal distribution. It also stems from the recognition that, absent physical barriers to entry, individual members of the species of concern could occur anywhere within the jurisdiction of the ALWTRP. Given these concerns, IEc worked with NMFS and the ALWTRT to develop methods of adjusting SPUE values to account for the potential presence of whales in areas or months for which the available SPUE are inadequate. Appendix C of the model's 2014 documentation describes these methods and presents an analysis of the impact of employing adjusted SPUE values on co-occurrence scores. See "Draft Technical Documentation for the Vertical Line Model," Prepared for NOAA National Marine Fisheries Service by Industrial Economics, Inc., March 2014.

EXHIBIT 9 . 2017 CUMULATIVE BASELINE CO- OCCURRENCE – RIGHT WHALES (2010 - 2018) / 2017 NUMBER OF VERTICAL LINES (ALL FISHERIES)



SCENARIO GENERATION

The model allows users to test for the impact of different management scenarios on the number of active vessels, the quantity of gear, and the degree of co-occurrence. Users may develop scenarios that employ one or more of the following actions:

- **Gear configuration requirements** – The user can develop scenarios that impose specific gear configuration requirements, such as establishing restrictions on the number of traps per trawl allowed in a given area. For example, in an area that currently allows fishermen to employ singles, users could develop a scenario that requires a minimum of three traps per trawl. In this case, the model would increase the number of traps per trawl for those model vessels fishing singles and doubles to three traps per trawl. This action would reduce the number of vertical lines in that area.
- **Redistribute fishing effort** – The user may wish to develop scenarios that call for an increase or decrease in fishing effort in an area. The model allows the user to specify, as a percentage ofbaseline effort, the magnitude of this change. For example, the user may wish to test the impact of a closure on a specific area. In this case, the model will eliminate all fishing effort within the selected area. The user can examine the effect of

displacement of effort to surrounding areas by adjusting the inputs for those areas to reflect the addition of displaced vessels.

REPORTING TOOLS

The model provides the capability to explore both baseline conditions and the implications of different management scenarios for each indicator described above. Results are available as:

- **Maps** – Users can produce a map for a specific month and indicator or the cumulative value across multiple months. In addition, users can develop maps that show the change in indicator values associated with a management measure (e.g., a reduction in co-occurrence from the baseline).
- **Spreadsheets** – Users can export results in a variety of file formats to support more complex analyses.
- **Animations** – Users can export monthly or seasonal maps to create animations in PowerPoint or other software. These animations can be used to visually display changes across months (or seasons) or between the baseline and alternative management scenarios.

ILLUSTRATIVE BASELINE RESULTS

Exhibits 10 and 11 provide maps that illustrate the monthly cumulative distribution of vessel activity and vertical line in the Northeast region, respectively. Exhibit 12 presents a map illustrating the change in cumulative co-occurrence associated with a recently considered management measure. Exhibit 13 presents a histogram illustrating the baseline distribution of vertical line, by region and month, across the Atlantic coast.

EXHIBIT 10 . CUMULATIVE 2017 BASELINE NUMBER OF ACTIVE VESSELS (ALL MONTHS / ALL FISHERIES)

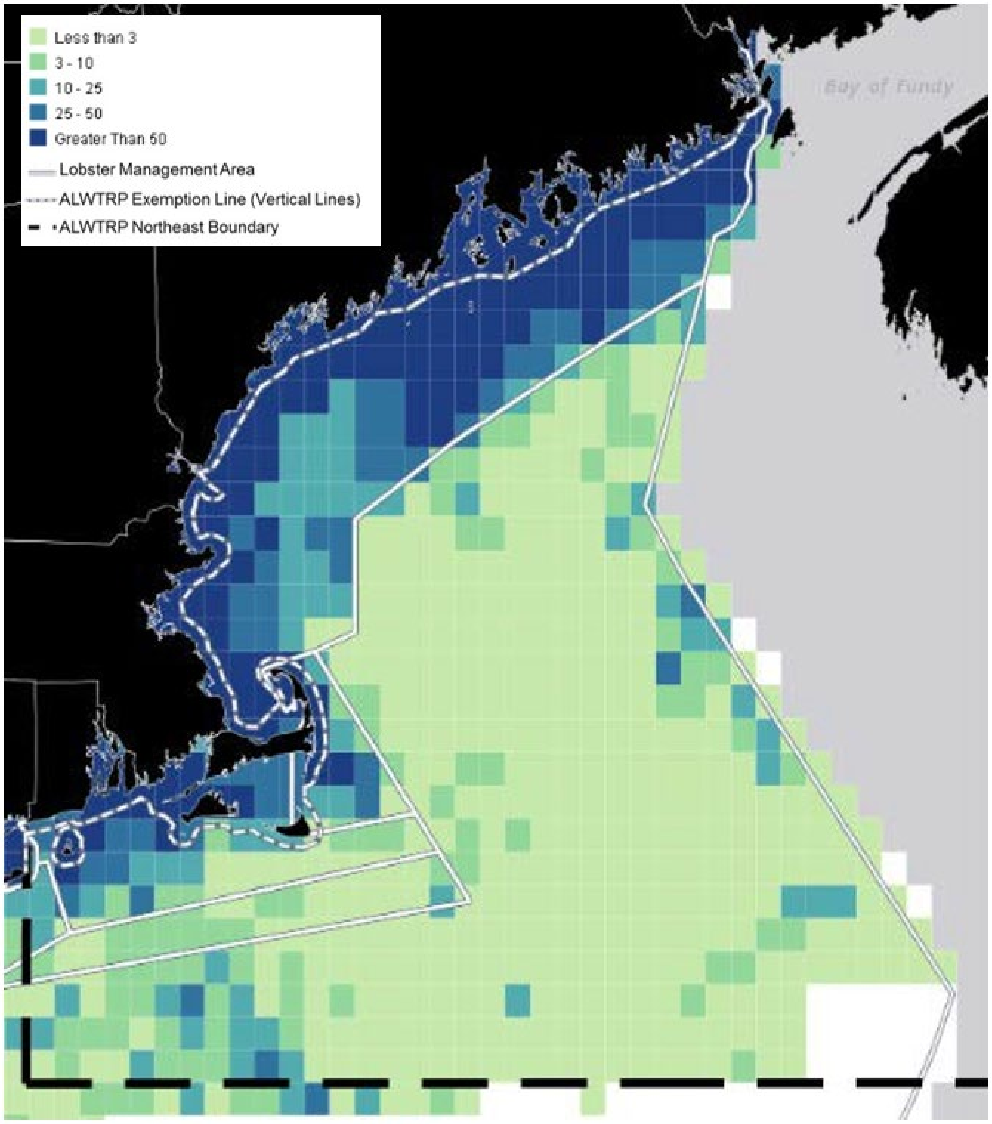


EXHIBIT 11 . CUMULATIVE 2017 BASELINE NUMBER OF VERTICAL LINES (ALL M ONTHS / ALL FISHERIES)

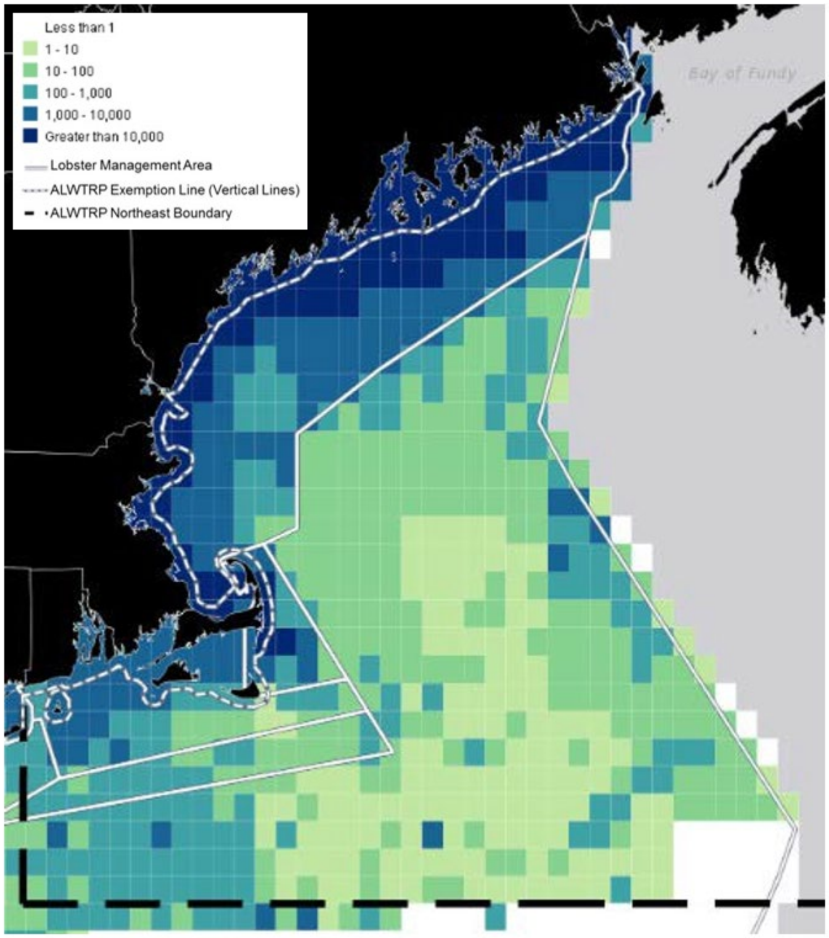


EXHIBIT 12 . CUMULATIVE CHANGE IN CO- OCCURRENCE IN RESPONSE TO A PROPOSED MANAGEMENT MEASURE (ALL MONTHS / ALL FISHERIES / RIGHT WHA LES 2010 - 2018)

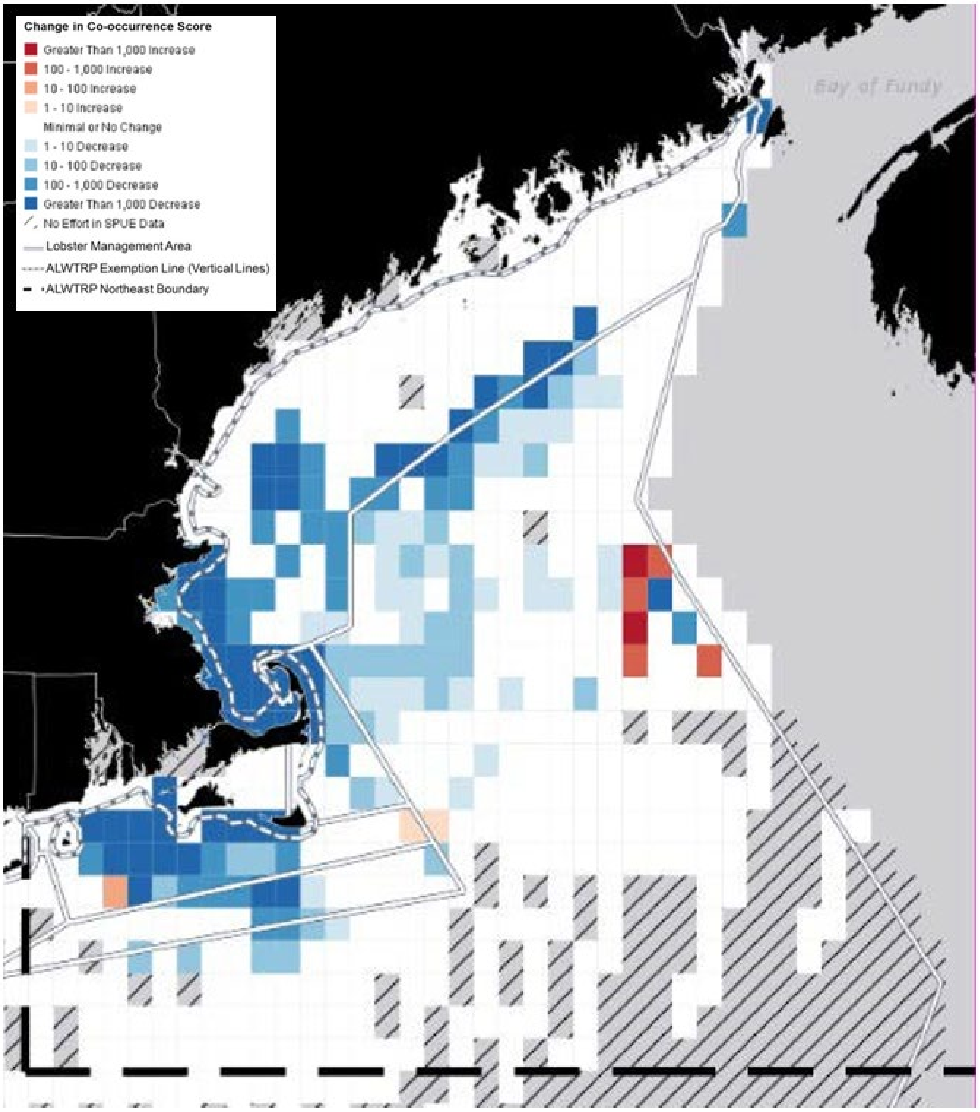
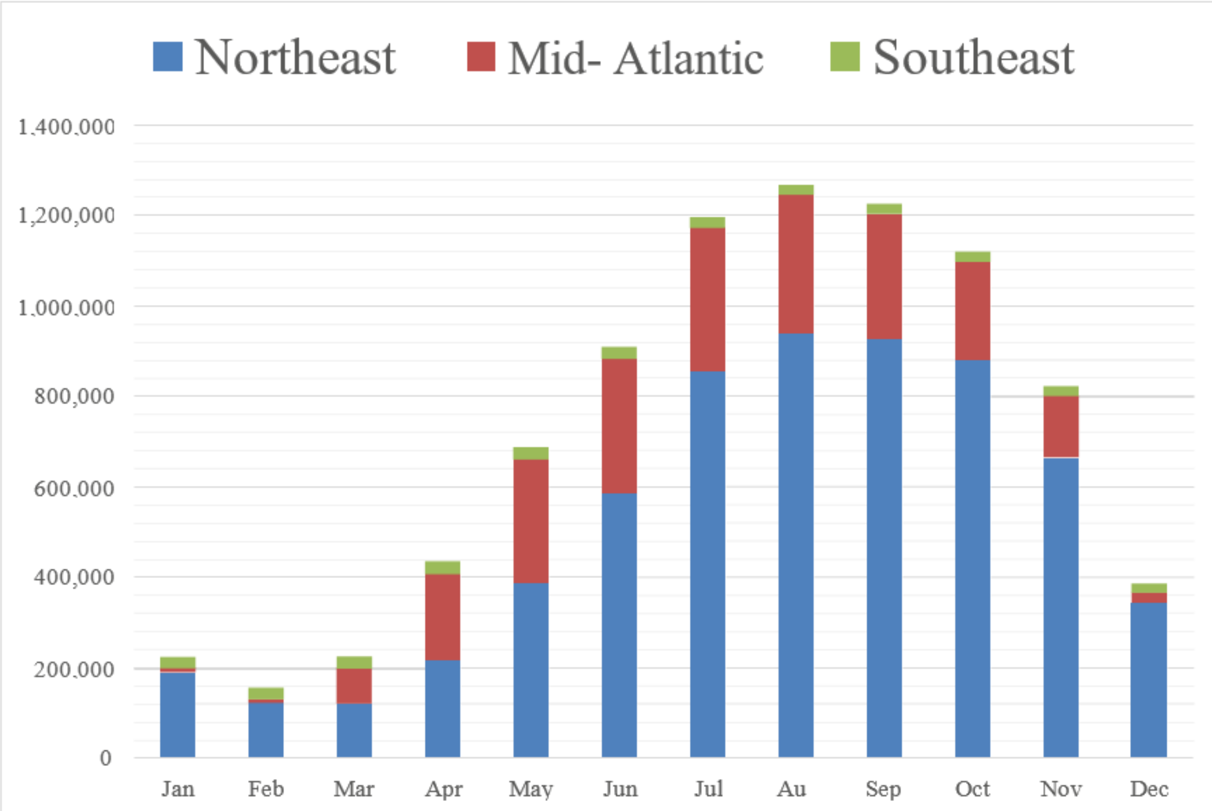


EXHIBIT 13 . 2017 BASELINE ESTIMATES – NUMBER OF VERTICAL LINES



4. LOCATION SPECIFIC METHODS AND DATA SOURCES

INTRODUCTION

The section details the location-specific methods and data sources employed in the Vertical Line/Co- occurrence Model. IEc reviewed the assumptions used to estimate vessel activity and gear use with representatives of state fisheries management agencies, NEFSC, NMFS gear experts, and fishermen on the ALWTRT. IEc shared its assumptions in writing and during multiple presentations to the ALWTRT and the Atlantic States Marine Fisheries Commission so that all participants were given the opportunity to review and comment. The documentation below incorporates this feedback, reflecting the latest 2017 baseline model assumptions. Throughout the discussion below, the documentation references numerous geographic areas used to assign gear configurations within the model. Appendix B identifies the geographic location, Region ID, and name of each region. It may be useful to refer to this appendix while reviewing the specific methods employed for each location.

USE OF VTR AND SOUTHEAST LOGBOOK DATA TO ESTIMATE VESSEL ACTIVITY

To estimate the number of active vessels that are subject to the requirements of the ALWTRP, the model employs information from both state and Federal datasets. As the primary source of information on activity in Federal waters, the model relies on two large datasets provided by NMFS:

- **Northeast Vessel Trip Report (VTR) system.** VTR covers waters north of Cape Hatteras, North Carolina. Most commercial fishing permits administered by NMFS' Greater Atlantic Regional Fisheries Office (GARFO) require fishermen to file a VTR at the conclusion of every trip.[15] VTR provides data on the gear the vessel employed and the area in which it fished, along with other information. Specifically, fishermen provide longitude and latitude coordinates that represent their average location for each fishing trip.
- **Southeast Logbook.** Similar to VTR, the Logbook requires trip-level reporting; however, fishermen are required to identify the location of their fishing effort on a 1-degree grid, as opposed to a specific location.

Through spatial analysis of the VTR and Logbook data, the model assigns trips to the spatial grid that the user specifies, creating a series of monthly datasets for each fishery (i.e., lobster, blue crab, other trap/pot, and gillnet). For each vessel, the model then apportions activity based on the ratio of trips reported within a particular grid cell to the total number of trips taken within the month. For example, consider a vessel that reports 10 trips during the course of a month, seven within Cell A and three within Cell B. The model apportions this vessel's activity for the month by assigning 0.7 active vessels to Cell A and 0.3 active vessels to Cell B. In the final step, the model sums the apportioned activity from all vessels within each grid cell.

[15] Technically, the regulations require fishermen to submit separate reports for each statistical area and type of gear fished. In practice, many fishermen compile all information for a single trip on one form.

Although the model employs VTR and Logbook data throughout its range (i.e., in state and Federal waters), the contribution of these data to the estimates of the number active vessels depends on the fishery and geographic location:

- **Lobster.** Unlike other permits administered by GARFO, Federal lobster permits currently impose no trip report requirements. As a result, the VTR database typically does not contain information on the activity of vessels that hold a Federal lobster permit but no other Federal permit. This is of particularly concern in LMA 1 (off the coast of Maine, New Hampshire, and northeastern Massachusetts), where vessels that hold only a Federal lobster permit are common.
  At the recommendation of Northeast state fisheries administrators, the updated model uses state-collected data to characterize the activity of lobster vessels in Northeast Nearshore waters.[16] The model relies on VTR data, along with NMFS permit data, to characterize activity in the Northeast Offshore, Mid-Atlantic Nearshore, and Mid-Atlantic Offshore lobster fisheries.
- **Blue Crab.** While some fishing for blue crab occurs in the Northeast region, analysis of VTR and discussions with state fisheries managers indicate that most blue crab fishing occurs south of New Jersey. To reflect blue crab's importance in these waters, the model identifies blue crab as a separate fishery (based on VTR and Logbook gear and species codes) in waters south of the New Jersey/Delaware border.[17] This fishery is heavily concentrated in state waters. This is confirmed by 2017 fishing activity data, which report no blue crab fishing in Federal waters south of New Jersey. As a result, the model uses state logbook data to account for the majority of blue crab effort.
- **Other Trap/Pot.** Within the other trap/pot (OTP) fishery, commercial fishermen frequently maintain and use different types of gear to target different species. For purposes of analysis, the model assumes that each OTP vessel maintains separate sets of gear for each species it targets. To provide an accurate characterization of the amount of gear such vessels employ, the model treats multi-purpose trips as separate events. For example, a vessel that targets both black sea bass and hagfish on the same trip is treated as having taken two trips to the same location. The determination of the species targeted is based on VTR and Logbook gear and species codes. VTR and Logbook data contribute to estimates of fishing activity in both state and Federal waters, where these fisheries are permitted.
- **Gillnet.** The model identifies gillnet activity based on VTR and Logbook gear codes. VTR and Logbook data contribute to estimates of fishing activity in both state and Federal waters, where these fisheries are permitted.

[16] The previous version of model used Federal permit data, in conjunction with VTR, to characterize the activity of lobster vessels in all Federal waters. A modified version of this approach is still in use to characterize vessel activity in the offshore lobster fishery.

[17] Blue crab fishing activity north of this border is included as a component of the other/trap pot fishery.

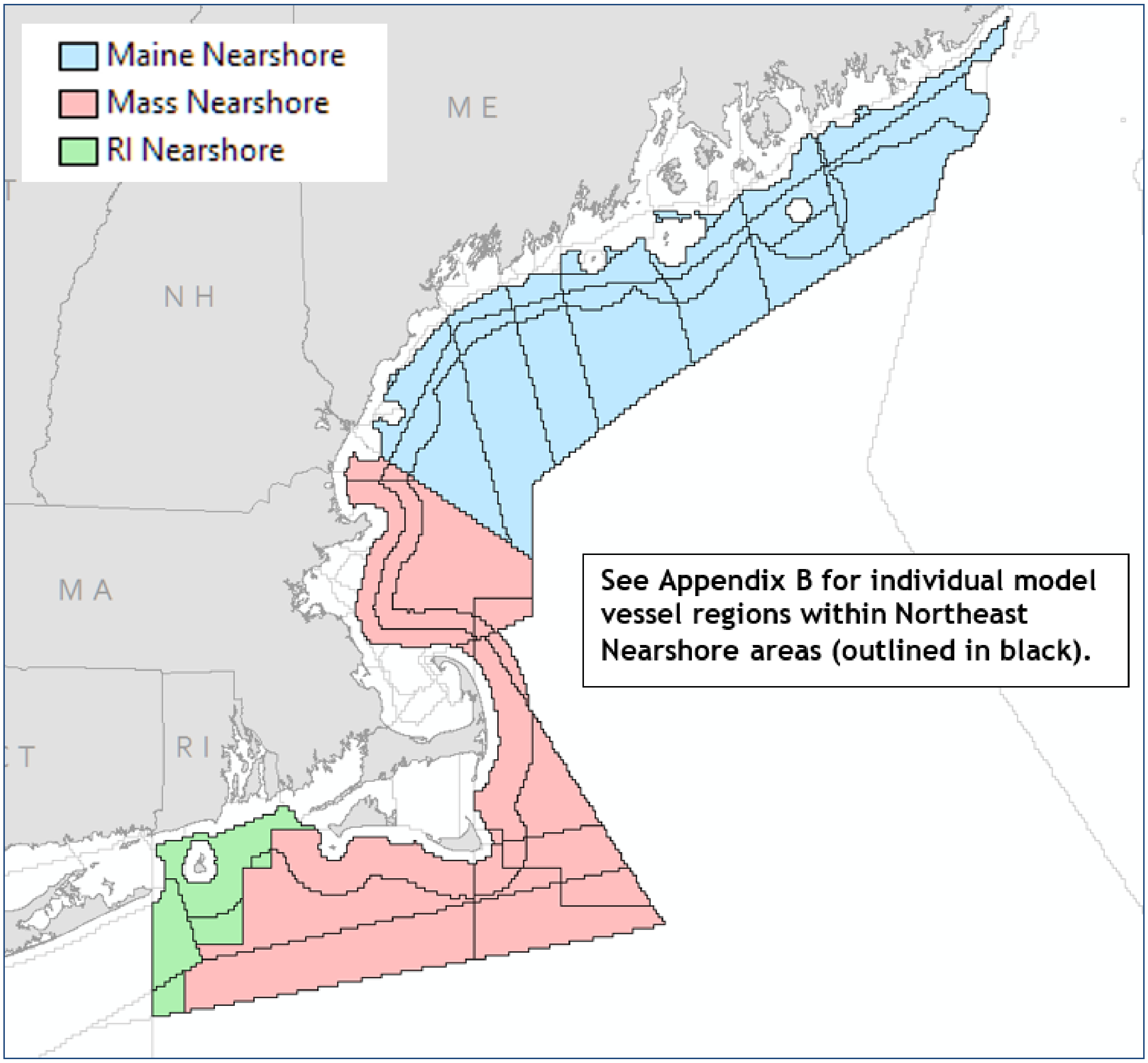
ACCOUNTING FOR RECENT VERTICAL LINE RULEMAKINGS

The data the model employs to characterize gear configurations in state waters do not distinguish between areas subject to the vertical line rules and those that are exempt. Therefore, the data often show vessels fishing in a manner that would be prohibited in areas subject to minimum trawl size requirements. To characterize activity in non-exempt waters, we assume these vessels trawl up to the nearest legal gear configuration. For example, the Maine data show a proportion of vessels fishing singles in state waters, which is allowed in the exempted area, but prohibited in the non-exempt waters. In the non-exempt share of the state zones, we assume this proportion of vessels fishes doubles, as allowed by the Plan.

FEDERAL NORTHEAST NEARSHORE WATERS

In the Northeast, Nearshore waters comprise the portions of LMAs 1, 2, 4, and the Outer Cape that lie outside of state waters (see Exhibit FED-1). Because of their intermediate position, the methods for characterizing activity and gear configurations in nearshore waters are hybrid in nature, incorporating data from diverse sources, including state logbook programs. To the extent that the model incorporates state- submitted data for nearshore waters, the methods are included in each state's profile (see below). The discussion below provides an overview of these methods, highlighting the ways in which the model integrates state data and Federal data to form a more refined characterization of activity and gear. The discussion begins with a review of methods used to estimate the number of active vessels in Nearshore waters, then describes methods for characterizing gear configurations.

EXHIBIT FED- 1 . NORTHEAST NEARSHORE MODEL VESSEL REGIONS



Northeast Nearshore Lobster

Active Vessels

The principal obstacle to estimating vessel activity in nearshore waters is the fact that lobster vessels holding only a lobster permit (i.e., no permits for other species) are not required to report to the Federal VTR program. To address this extensive reporting gap, the model previously used Federal permit data to estimate the number of non-reporters. In the absence of better information, the model distributed the activity of these vessels evenly across nearshore waters. State fisheries managers reviewing the earlier model asserted that this approach misrepresented the level of effort and spatial distribution of activity.

Based on their recommendation, the current version of the model characterizes activity in nearshore waters using state data on vessels that hold Federal permits but do not report to VTR.

Specific data sources and methods for each state are as follows:

- **Maine.** The Maine Department of Marine Resources (DMR) "100% Dealer Reporting" data report the individual vessels that were active in each of the seven Maine lobster zones in each month (see Exhibit ME-1 below). Active vessels are those that landed at least 100 pounds of lobster. The vessels identified include all federally permitted vessels, regardless of whether they are subject to VTR requirements. We rely on these data to estimate the number of active vessels operating in each zone. Within each zone, the model distributes the location of vessel activity by distance from shore (i.e., 0-3, 3-12, or 12+ miles). The distribution of activity by distance from shore within each lobster zone is derived from Maine's "10% Harvester Reporting" data, which provides information on the location of activity for the vessels included in the harvester survey sample.
- **New Hampshire.** The New Hampshire Fish and Game Department (FGD) requires that fishermen who land up to 1,000 pounds of lobster in a calendar year report their activity using the Annual Lobster Harvester Report, which includes a monthly summary of fishing activity. Fishermen who land over 1,000 pounds in a calendar year must file the Lobster Fisherman and Dealer Reporting Form, which includes trip-level data. To avoid double-counting activity captured in Federal datasets, we remove from the FGD dataset all records for fishermen who also report to the Federal VTR system. The FGD data indicate that a small number of New Hampshire-based vessels fish in nearshore waters (LMA 1 or Statistical Area 513), but do not report to VTR. Nearshore activity therefore includes these vessels, plus relevant activity reported in VTR.
- **Massachusetts.** The Massachusetts Division of Marine Fisheries (MA DMF) provided detailed vessel-level data to support development of the Vertical Line Model. Merging information from the trip-level and annual reporting components of its Catch Report data, MA DMF provided a comprehensive database of activity and gear configurations for all fixed-gear fisheries in 2017. The DMF dataset allows identification and removal of vessels that are subject to Federal VTR requirements. Therefore, the model characterizes activity in Massachusetts' nearshore waters (Massachusetts Statistical Reporting Areas 15 through 20) on the basis of the VTR dataset, supplemented by information from the DMF dataset on vessels that are not subject to VTR requirements.
- **Rhode Island**. The Rhode Island DEM Division of Marine Fisheries (RI DEM) provided 2017 vessel-level data from its state logbook program. The data include information on the activity of Federal permit holders fishing in Federal portions of NMFS statistical areas 539 and 611, as well as activity in statistical areas 537, 616, and 623. The model distributes this activity evenly across the relevant statistical area. Additional nearshore effort reported to VTR is added to the activity of non-VTR

reporters captured in the RI DEM data.

The model's revised approach uses state-reported active vessel data to help characterize effort in overlapping regions of Federal nearshore waters in LMAs 1, 2, 4, and the Outer Cape. Exhibit FED-2 summarizes the nature of the overlap and the approximate number of vessels that the model incorporates from overlapping input areas. The Model Vessel Region(s) column reflects the region to which the vessels are attributed in the model output. The Overlapping State Area column reflects the area of overlap from a neighboring state. For example, depending on the month, the model evenly distributes one to four vessels from Massachusetts SRA 20 across the Federal portions of ME Zone D, E, F, and G outside 3 miles.

EXHIBIT FED- 2 . LOBSTER ACTIVITY IN OVERLAPPING FEDERAL NORTHEAST NEARSHORE REGIONS

NMFS STAT AREA	MODEL VESSEL REGION(S)	OVERLAPPING STATE AREA	APPROXIMATE NUMBER OF VESSELS FROM OVERLAPPING STATE VESSEL DATA*
513	Portions of ME Zones D, E, F, and G outside 3 miles	MA SRA 20	1 - 4 vessels in Federal waters only
		NH 513	2 - 4 vessels in Federal waters only
514	Portions of ME Zones F and G outside 12 miles	MA SRA 19	3 - 8 vessels based on area of overlap (assumes equal distribution of vessels across the overlapping areas)
537	MA SRA 12 and MA SRA 18	RI 537	0 to 2 vessels
539	RI 539	MA SRA 15	0 vessels reported in 2017

Exhibit FED-3 summarizes the number of active vessels in northeast nearshore waters, by model vessel area and month.

Gear Configurations

State logbook data also provide the detailed information needed to characterize gear configurations in Northeast Nearshore waters. The specification of each model vessel includes the total number of traps that the vessel fishes and the number of traps fished per trawl. As with northeast state waters, the model applies a distributional approach to characterize gear configurations in nearshore waters. Rather than estimate the concentration of vertical line based on a single model vessel designed to represent the average or typical configuration of gear, the model specifies multiple model vessels – representing the mix of gear configurations currently in use – and specifies the percentage of active lobster vessels to which each configuration applies. Appendix C presents the distribution of gear configurations for Northeast Nearshore waters. The table shows each model vessel area and month combination, and the percentage distribution of vessels to each gear configuration bin (i.e., the combination of traps fished and traps per trawl).

The data and methods for relevant northeast states are presented in the sections below. Note that where appropriate, the model adjusts the trap-per-trawl figures to conform to the requirements enacted in 2014/2015. These minimum trap-per-trawl requirements apply in a large share of Northeast Nearshore waters.

EXHIBIT FED- 3 . ACTIVE LOBSTER VESSELS IN NORTHEAST NEARSHORE WATERS (2017)

NEARSHORE AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Maine State Zone A 3-12 Miles	46	27	35	54	85	93	112	112	116	113	104	87
Maine State Zone B 12+	14	12	9	11	12	10	10	3	2	7	4	4
Maine State Zone B 3-12 Miles	38	8	20	30	36	44	48	45	56	58	63	50
Maine State Zone C 12+	15	16	21	18	16	17	15	12	12	11	14	16
Maine State Zone C 3-12 Miles	66	39	38	52	47	49	41	35	44	58	64	67
Maine State Zone D 12+	55	35	39	55	46	42	37	35	37	42	44	44
Maine State Zone D 3-12 Miles	43	28	40	41	55	43	40	49	52	50	58	52
Maine State Zone E 12+	23	25	24	23	14	12	13	13	9	9	9	16
Maine State Zone E 3-12 Miles	34	21	32	26	28	21	12	17	29	29	30	28
Maine State Zone F 12+	15	23	22	16	6	8	8	10	11	17	12	18
Maine State Zone F 3-12 Miles	60	44	34	36	25	29	19	20	20	20	24	25
Maine State Zone G 12+	11	11	9	8	6	5	5	5	6	5	5	6
Maine State Zone G 3-12 Miles	35	21	23	39	41	36	35	34	39	40	44	44
NH 513	2	2	2	2	2	2	2	3	3	4	4	3
Mass SRA 15	-	-	-	-	-	-	-	-	-	-	-	-
Mass SRA 16	4	3	2	3	4	7	8	8	10	9	7	7
Mass SRA 17	-	-	-	-	1	1	1	1	1	1	1	-
Mass SRA 18	-	-	-	-	2	3	4	5	5	5	4	4
Mass SRA 19	28	12	11	15	23	16	15	22	28	37	40	33
Mass SRA 20	4	4	4	3	3	4	1	1	1	2	2	2
RI 537	2	-	2	2	2	2	2	1	1	1	1	2
RI 539	8	5	6	12	18	19	24	22	20	18	14	12
RI 611	-	-	-	-	-	1	1	1	1	-	-	-
RI 616	2	-	2	2	2	2	2	2	2	2	2	2
RI 623	-	-	-	-	1	1	1	1	1	1	1	1

Maine Nearshore Waters

To characterize gear configurations in Maine's nearshore waters, the model relies on DMR's 10% Harvester Reporting data. These trip-level data provide essential information on the total quantity of gear that a vessel fishes in a given area, as well as information that enables us to infer trawl configurations (see below). The data are reported by mile sub-area of each lobster zone, allowing a more detailed characterization of gear configurations in the region. Furthermore, Maine DMR provided Harvester data compiled across several years. Where appropriate, we pool data from 2015 to 2017 to characterize variations in gear configuration across areas and months. The model applies the following procedures to estimate vertical lines based on gear configuration:

- **Gear Quantity.** The Harvester data indicate the total number of traps that a vessel fished at the time of the trip recorded. The model calculates the average quantity of gear for each vessel in each month/area combination. To specify a distribution for these parameters, we create several categories or bins for classifying data records. For traps fished per vessel, we use the following categories for the specification of model vessels: 1-100, 101-300, 301-500, 501-700, and 701 or more traps.

- **Traps per Trawl.** Fishermen report the total number of traps hauled in a given trip, as well as the number of hauls performed. Dividing the number of traps hauled in a month by the total number of hauls provides an estimate of average traps per trawl for the month. The model assumes that if the traps-per-haul figure is five or less, the vessel fishes with one endline per trawl. If the traps per haul figure is greater than five, we assume two endlines are used. For traps per trawl, the model uses the following categories for the specification of model vessels: 1, 2, 3-4, 5-9, 10-14, 15-19, 20-39, and 40+ traps per trawl.
- **Gear Distributions.** The model cross-tabulates traps per vessel and traps per trawl, estimating the percentage of vessels that fish different configurations. We develop a separate gear distribution for each month for each of Maine's 21 nearshore model vessel areas.
- **Point Estimates.** To calculate the number of vertical lines deployed, the model must apply specific numerical values to parameters specified with ranges. For example, for the traps per trawl variable, we need to assign numerical values to the "10 to 14" range, etc. To do so, we calculate the average traps per trawl for all responses in the range, across all months. We do the same for the number of traps fished, calculating an average number of traps for each of the ranges. The point estimates are calculated collectively for all Maine nearshore waters. Exhibit FED-4 summarizes the point estimates.

EXHIBIT FED- 4. POINT ESTIMATES APPLIED FOR LOBSTER GEAR CONFIGURATION RANGES IN MAINE NEARSHORE WATERS

VARIABLE	RANGE	POINT ESTIMATE
Traps per Trawl	3-4	3.5
	5-9	6.8
	10-14	11.5
	15-19	16.3
	20-39	20.9
	40+	NA
Number of Traps Fished	1-100 Traps	54.2
	101-300 Traps	213.5
	301-500 Traps	409.5
	501-700 Traps	604.9
	701+ Traps	789.8

Note: Over the last few years, Maine implemented regulations limiting trawl length and traps fished in several geographic areas. In these areas, the distribution of model vessels is modified to comport to these regulatory limits.

Massachusetts Nearshore Waters

The MA DMF Catch Report data provide a foundation for characterizing gear configurations in Massachusetts nearshore waters (SRAs 15 through 20). For lobster vessels, the model applies the following methods:

- **Gear Quantity.** The Catch Report data indicate the total number of traps that a vessel fished during the month. To specify a distribution for these parameters, we create several categories or bins for classifying data records. For traps fished per vessel, we use the following categories for the specification of model vessels: 0-99, 100-299, 300-499, 500-799, and 800+.
- **Traps per Trawl.** Massachusetts lobstermen do not explicitly report traps per trawl; they do, however, report the number of traps they fished and the number of vertical lines they employed. We combine this information to estimate traps per trawl. We first divide the number of pots fished by the number of lines fished to calculate the number of traps per line. Consistent with DMF guidance, we then assume that if traps per trawl is less than or equal to three, the vessel fishes with one endline per trawl. If traps per trawl is four or greater, we assume two endlines are used. The traps per trawl estimates are derived by multiplying the number of traps per line by the assumed lines per trawl. To define model vessels, the model uses the following categories or bins for traps per trawl: 1, 2, 3, 4-5, 6-9, 10-14, 15-19, and 20+ traps per trawl.
- **Gear Distributions.** The model cross-tabulates traps per vessel and traps per trawl, estimating the percentage of vessels that fish different configurations. We develop a separate gear distribution for each month for each of the five nearshore model vessel areas (SRAs 16 through 20) where vessels were active in 2017.

EXHIBIT FED- 5. POINT ESTIMATES APPLIED FOR LOBSTER GEAR CONFIGURATION RANGES IN MASSACHUSETTS NEARSHORE WATERS

PARAMETER	RANGE	NEARSHORE SRA 15/16	NEARSHORE SRA 17/18	NEARSHORE SRA 19/20
Traps per Trawl	6 to 9	NA	NA	NA
	10 to 14	10.8	11.2	10.5
	15 to 19	16.5	17.1	16.5
	20+	44.6	39.1	35.8
Number of Traps Fished	0-99	54.6	NA	45.0
	100-299	185.0	172.9	187.9
	300-499	372.1	389.2	366.8
	500-799	617.2	690.1	639.4
	800+	1,314.8	1,386.5	800.2

- **Point Estimates.** To calculate the number of vertical lines deployed, the model must apply specific numerical values to parameters specified with ranges. The model calculates the average traps per trawl for all responses in the range, across all months. For traps fished, the model calculates an average number of traps for each of the ranges. We develop separate gear configuration parameters for three partially consolidated nearshore areas (SRAs 15/16, 17/18, and 19/20). Exhibit FED-5 summarizes the resulting values.

Rhode Island Nearshore Waters

Rhode Island DEM's logbook data provide a foundation for characterizing lobster gear configurations in nearshore waters:

- **Gear Quantity.** The RI logbook data allow us to characterize the average number of traps that each lobster vessel fishes in a given month. Each vessel fishing in nearshore waters is assigned to one of the following traps-per-vessel categories: 1-100, 101-500, 501-800, and 801+.
- **Traps per Trawl.** On the advice of RI fisheries experts, the model uses trap allocation as a proxy for trawl configuration, applying the following assumptions: vessels allocated 50 or fewer traps are likely to fish singles; vessels allocated 51 to 100 traps are likely to fish five-trap trawls; vessels allocated 101 to 200 traps are likely to fish 10-trap trawls; and vessels allocated 201 or more traps are likely to fish 15-trap trawls.
- **Gear Distributions.** We cross-tabulate traps per vessel and traps per trawl, estimating the percentage of vessels that fish different configurations. We develop a gear distribution for each month for all nearshore water areas as a group.
- **Point Estimates.** To calculate the number of vertical lines deployed, the model must apply specific numerical values to parameters specified with ranges. Exhibit FED-6 summarizes the point estimate figures estimated for Rhode Island nearshore waters. These point estimates are combined with the percentage gear distributions to estimate the number of endlines for each month/area combination.
- **Endlines per Trawl.** Vessels fishing five-trap trawls are assumed to use one endline, while longer trawls are fished with two endlines.

EXHIBIT FED- 6 . POINT ESTIMATES APPLIED FOR LOBSTER TRAPS FISHED RANGES IN RHODE ISLAND NEARSHORE WATERS

TRAPS FISHED CATEGORY	1 TRAP PER TRAWL	5 TRAPS PER TRAWL	10 TRAPS PER TRAWL	15 TRAPS PER TRAWL	20 TRAPS PER TRAWL
1 to 100	NA	NA	38.0	71.4	NA
101 to 500	NA	NA	145.2	267.2	267.2
501 to 800	NA	NA	NA	700.7	NA
801+	NA	NA	NA	1,372.7	1,372.7

Northeast Nearshore Gillnet and Other Trap/ pot Vessels

The model uses the VTR-based approach discussed above to estimate the number of active vessels in the Northeast Nearshore gillnet and fisheries. The VTR dataset identified no trips in Nearshore waters off the coast of Maine and New Hampshire. Exhibit FED-7 summarizes the number of active gillnet and OTP vessels in Northeast Nearshore waters by month, respectively.

The specification of model vessels for the Northeast Nearshore gillnet and other trap/pot vessels was developed using the same data sources as those used to produce the model vessels assigned to Massachusetts and Rhode Island state waters. The in-depth discussions for these states (below) provide details on the gear configurations assigned to Northeast Nearshore gillnet and other trap/pot vessels.

EXHIBIT FED- 7 . ACTIVE GILLNET AND OTP VESSELS IN NORTHEAST NEARSHORE WATERS (2017)

NEARSHORE AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Gillnet Mass Nearshore Areas (includes LMAs 1,2, Outer Cape)	16	4	2	7	14	73	136	118	103	71	33	30
Gillnet RI Nearshore Areas (includes Areas 539 and 613)	1	1	0	3	11	12	10	2	4	7	10	9
OTP Mass Nearshore Areas (includes LMAs 1,2, Outer Cape)	1	2	0	1	0	0	3	4	5	7	3	4
OTP RI Nearshore Areas (includes Areas 539 and 613)	0	0	0	0	3	3	3	1	6	5	6	3

NORTHEAST OFFSHORE WATERS

State data do not cover activity or gear configurations for vessels operating in the offshore waters of LMA 3. The methodologies for offshore waters rely on VTR data, supplementary Federal data sets, and other expert input, as discussed below. These approaches are similar to those applied in earlier versions of the model.

Active Vessels

A Federal lobster permit gives a vessel the right to fish in the LMA the permit specifies. The VTR database typically does not contain information on the activity of vessels that hold a Federal lobster permit but no other Federal permit. Information on the location of trips taken by vessels that hold Federal lobster permits is limited to those that also hold permits for other fisheries that impose VTR requirements; these vessels must report all fishing activity to GARFO.

To identify vessels that hold only a lobster permit and are not required to submit VTRs, the model relies on NMFS' Northeast Permit Database. For LMA 3, the model compares VTR and permit data to identify vessels that are permitted only for the lobster fishery and thus not subject to VTR requirements. Because some fishermen maintain a Federal lobster permit but do not actively fish, the model estimates the number of such vessels that are active within the LMA by scaling the total number vessels permitted to fish LMA 3 by the proportion of other permitted lobster trap/pot vessels (i.e., those vessels required to report to VTR) that actively fished in a given month.

In the absence of more detailed information on the location of fishing activity, the model distributes non- reporters based on the location of VTR reporters. Specifically, at the recommendation of the NEFSC, the proportional distribution of VTR reporters to each NMFS statistical area within LMA 3 is used to apportion non-reporters. The model assumes that the activity of these vessels within each statistical area is evenly distributed. Finally, to estimate the total number of vessels active in each grid cell for each month, the model adds the number of active vessels estimated from the permit data to the number obtained from VTR. The VTR reporters include not only lobster vessels, but gillnetters and OTP vessels.[18] Exhibit FED- 8 summarizes the model's estimate of the number of active vessels in offshore waters.

EXHIBIT FED- 8 . ACTIVE VESSELS IN NORTHEAST OFFSHORE WATERS (2017)

NEARSHORE AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lobster	66	64	58	58	50	68	79	70	70	75	77	80
Gillnet	18	27	29	38	32	27	11	12	8	8	4	6
Other Trap/Pot	2	2	2	4	4	4	4	3	1	1	3	5

Gear Configurations

The model uses simplified assumptions to characterize gear configurations used in Northeast Offshore waters. These assumptions come from a variety of sources, as described below:

- **Lobster.** Model inputs for lobster vessels in offshore waters are based on data developed for the NEFSC's Decision Support Tool (DST). We average across all the traps per trawl observations provided by NEFSC to obtain an estimate for each month. NEFSC also provided the total traps fished in each month; we divide this figure by the number of active lobster vessels in LMA 3 to obtain the average number of traps fished per vessel, and use that figure to specify a model vessel for each month.
- **Gillnet and other trap/pot.** The specification of model vessels for the offshore gillnet fishery relies on data collected through the Northeast Domestic Fisheries Observer Program, which is operated by NEFSC. The Northeast Observer Program maintains and distributes data on fishing activity off the Northeastern and Mid-Atlantic U.S. for scientific and management purposes. Under the program, trained scientific observers travel aboard commercial fishing vessels to obtain data that are not readily obtainable by other means, focusing on detailed observations of gear rigging and deployment. Using records from the Observer dataset for 2015 through 2018, model vessels were developed for the Northeast offshore sink gillnet and Northeast offshore other trap/pot fisheries. To characterize the gillnet fishery, the model assigns four strings per vessel and two endlines per string for all months. For the other trap/pot fishery, the model assigns 518 traps, 148 traps per trawl, and two endlines per string for all months based on the offshore red crab fishery, which fishes in long trawls.

[18] Within the OTP fishery, commercial fishermen often maintain and use different types of gear to target different species. Thus, the model assumes that each OTP vessel maintains separate sets of gear for each species it targets. To provide an accurate characterization of the amount of gear such vessels employ, the model treats multi-purpose trips as separate events. For example, a vessel that targets both black sea bass and hagfish on the same trip is treated as having taken two trips to the same location. The determination of the species targeted is based on VTR and Logbook gear and species codes.

MID- ATLANTIC AND SOUTHEAST FEDERAL WATERS

Active Vessels

To estimate the number of active vessels in Mid-Atlantic and Southeast Federal waters the model relies on VTR and Southeast Logbook data, respectively, using the approaches previously described for these data sources. Exhibit FED-9 summarizes, by fishery and month, the model's estimate of the number of active vessels in Mid-Atlantic and Southeast Federal waters.

EXHIBIT FED- 9. ACTIVE VESSELS IN MID- ATLANTIC AND SOUTHEAST FEDERAL WATERS (2017)

AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Mid-Atlantic Nearshore Lobster	9	6	8	8	5	19	21	1	18	20	17	15
Mid-Atlantic Offshore Lobster	12	7	12	12	14	16	19	17	18	16	15	13
Mid-Atlantic Nearshore Gillnet	65	50	38	44	33	28	8	8	15	20	34	49
Mid-Atlantic Offshore Gillnet	10	8	13	16	17	4	1	3	5	4	4	6
Mid-Atlantic Nearshore Other Trap/pot	19	11	4	13	15	17	14	13	16	18	23	25
Mid-Atlantic Offshore Other Trap/Pot	4	5	1	2	3	3	4	4	4	5	2	1
Southern Nearshore Gillnet	4	3	5	8	5	5	3	3	6	9	14	8
Southern Offshore Gillnet	0	0	0	0	0	0	0	0	1	1	1	1
Southern Nearshore Other Trap/Pot	5	6	3	3	3	3	1	1	0	1	2	2
Southern Offshore Other Trap/Pot	2	3	1	4	1	2	1	0	0	0	0	0

Gear Configurations

The model uses simplified assumptions to characterize gear configurations used in Mid-Atlantic and Southeast Offshore waters. These assumptions come from a variety of sources as described below and are summarized in Exhibit FED-10:

- **Mid-Atlantic Nearshore and Offshore lobster, gillnet, and other trap/pot.** The specification of model vessels for the offshore gillnet fishery relies on data collected through the Observer Program. Using these data, separate model vessels were developed for the Mid-Atlantic Nearshore and Offshore lobster, gillnet, and other trap/pot fisheries based on the average Observer values for these regions using records for 2015 through 2018. The model assigns these values for all months.[19]

[19] In addition to those specified in Exhibit FED-10, the model also assigns model vessels to the portion of the LMA 2/3 overlap that intersects with NMFS Statistical Area 613, based on information available from RI DEM. The model specifies two model vessels, both fishing 15 traps per trawl, with 267 and 1,373 traps fished, respectively.

- **Southeast Nearshore and Offshore gillnet.** The specification of model vessels for the Southeast Nearshore and Offshore gillnet fishery relies on data collected through the Southeast Domestic Fisheries Observer Program, which is operated by Southeast Fisheries Science Center (SEFSC). The Southeast Observer Program maintains and distributes data on fishing activity off the Southeast U.S. for scientific and management purposes. Using average values from the Observer dataset for 2015 through 2018, model vessels were developed for the Southeast Nearshore and Offshore gillnet fisheries. The model assigns these values for all months.
- **Southeast Nearshore and Offshore other trap/pot.** The Southeast Logbook provides basic information on the number of traps hauled per trip. The model uses the average number of traps hauled for trips using trap/pot gear for 2017. Based on discussion with NMFS gear experts, the model assumes all Federal Southeast other trap/pot vessels employ singles with one endline per trawl. The model assigns these values for all months.

EXHIBIT FED- 10 . MID- ATLANTIC AND SOUTHEAST FEDERAL MODEL VESSEL CONFIGURATIONS

MODEL VESSEL	TRAPS OR STRINGS FISHED	TRAPS PER TRAWL	ENDLINES PER TRAWL OR STRING
Mid-Atlantic Nearshore Lobster	736	21	2
Mid-Atlantic Offshore Lobster	1460	46	2
Mid-Atlantic Nearshore Gillnet	3.8	-	2
Mid-Atlantic Offshore Gillnet	5.1	-	2
Mid-Atlantic Nearshore Other Trap/Pot	444	26	2
Mid-Atlantic Offshore Other Trap/Pot	432	128	2
Southern Nearshore Gillnet	1.5	-	2
Southern Offshore Gillnet	1.5	-	2
Southern Nearshore Other Trap/Pot	346	1	1
Southern Offshore Other Trap/Pot	346	1	1

GENERAL APPROACH TO STATE WATERS

NMFS and IEc have worked directly with state marine resource officials to develop baseline modeling assumptions for vessels fishing exclusively in state waters. Key modeling parameters for lobster, blue crab, and other trap/pot vessels include: (1) the number of vessels active in different months of the year;
(2) the total number of traps fished in different areas; and (3) the typical number of traps per trawl. For gillnet vessels, key parameters include: (1) the number of vessels active in different months of the year; and (2) the total number of strings typically fished.

The model development effort focused on obtaining the most recent and highest quality data available from each state to characterize fishing effort in state waters. Exhibit ST-1 provides a brief overview of the data sources. As shown, the model relies primarily on data for 2017; the data for Connecticut are from 2016, while the data for Georgia include information characterizing activity in both 2017 and 2018. The exhibit also characterizes information obtained on gear configurations. As shown, gear information sources are of similar vintage and vary from state to state:

- For some states, key gear configuration parameters are estimated based on reporting data (e.g., logbook data) furnished by fishermen in accordance with state requirements.
- For other states, surveys are the primary source of gear configuration information. In some cases, these surveys are one-time efforts, while others are administered annually (e.g., recall surveys).
- For other states, gear configurations are largely based on the best professional judgment of state fisheries experts.

In some cases, the gear data are taken from a mix of sources (e.g., surveys and best professional judgment).

The individual state profiles in this section provide detailed descriptions of the data and analysis used to characterize vessels fishing in state waters.

EXHIBIT ST- 1 . OVERVIEW OF STATE DATA SOURCES

STATE	YEAR COVERED BY MOST RECENT ACTIVITY DATA	GEAR CONFIGURATION DATA	
		DATA SOURCE	YEAR
ME	2017	Reporting	2017
NH	2017	Reporting	2017
MA	2017	Reporting/Survey	2017
RI	2017	Reporting	2017
CT	2016	Reporting	2016
NY	2017	Reporting	2017
NJ	2017	BPJ	2017
DE	2017	Reporting	2017
MD	2017	Reporting/BPJ	2017
VA	2017	Reporting	2017
NC	2017	BPJ	2017
SC	2017	Reporting	2017
GA	2017/2018[1]	Survey	2017/2018[1]
FL	2017	Reporting	2017

Notes: Georgia DNR conducted its survey with blue crab fishermen in March of 2018, with the responses reflecting a mix of 2017 experience and anticipated 2018 activity

MAINE

The discussion below explains the model's characterization of the activity and gear associated with lobster vessels fishing in Maine waters.

Number of Active Vessels

To estimate the number of lobster vessels operating in state and nearshore waters off the Maine coast, the model incorporates two categories of data provided by the Maine Department of Marine Resources:

- First, DMR provided an extract of its "100% Dealer Reporting" data for 2017. These data report the individual vessels that were active in each of the seven Maine lobster zones in each month (see Exhibit ME-1). Active vessels are those that landed at least 100 pounds of lobster. The data also designate whether each vessel holds a Federal permit. The number of active vessels in each zone incorporates both state-permitted vessels as well as all federally permitted vessels.[20]
- Vessels in each zone are distributed to sub-areas defined by distance from shore, e.g., Zone G, 0-3 miles. Maine's "10% Harvester Reporting" data provide trip-level information on a variety of parameters, including more precise information on fishing location. Specifically, in the Harvester form, fishermen report whether they fished 0-3, 3-12, or 12+ miles from shore. These data allow the model to distribute effort in a given Zone proportionately to the distance sub-areas.[21] In doing so, we implicitly assume that the selection of reporters for the Harvester data is representative of overall effort and spatial distribution.

Exhibit ME-2 summarizes the estimated activity in each fishing area.[22]

Gear Configurations For Model Vessels

In many state waters, the model estimates the concentration of vertical line based on average gear configuration parameters for a given area. The size and complexity of the lobster fishery in Maine call for a more detailed approach. Rather than estimate the concentration of vertical line based on a single model vessel designed to represent the average or typical configuration of gear within a particular area, the chosen approach incorporates multiple model vessels for each area – representing the full range of gear configurations currently in use – and specifies the percentage of active vessels within the area to which each configuration applies.

To characterize gear configurations in Maine's state and nearshore waters, the model relies on DMR's 10% Harvester Reporting data. These trip-level data provide essential information on the total quantity of gear that a vessel fishes in a given area, as well as information allowing us to infer gear configurations (see below). As noted, the data are reported by distance from shore within each lobster zone, allowing a more detailed characterization of gear configurations in the region. Furthermore, the DMR provided Harvester data compiled across several years (2014-2017). Where appropriate, we pool data from 2015 to 2017 to characterize variations in gear configuration across areas and months. These years are selected to reflect fishing practices

[20] Unlike other Northeast states, the model relies exclusively on the Maine Dealer data for estimating active vessels, both state- and federally-permitted. VTR data are not incorporated into the active vessel count in Maine state and nearshore waters.

[21] Harvester data from 2015 through 2017 are used for this apportionment process.

[22] In addition to the lobster fishery, DMR also regulates the gillnet fishery and issues permits to gillnet vessels. However, DMR notes that very few gillnet vessels have been active in recent years. To the extent that gillnet vessels fish exclusively with state permits (and are therefore not reflected in the VTR data), the model may understate the use of vertical line in Maine waters.

prevailing after passage of the 2014 ALWTRP trawling requirements. Model vessels assigned in Maine consider the demarcations established by recent rulemakings, including the ALWTRP exemption line, "6-mile" line, "12-mile" line, and recent state regulations that limit traps and/or restrict trawl length in specific geographic areas.

EXHIBIT ME- 1. MAINE LOBSTER ZONES

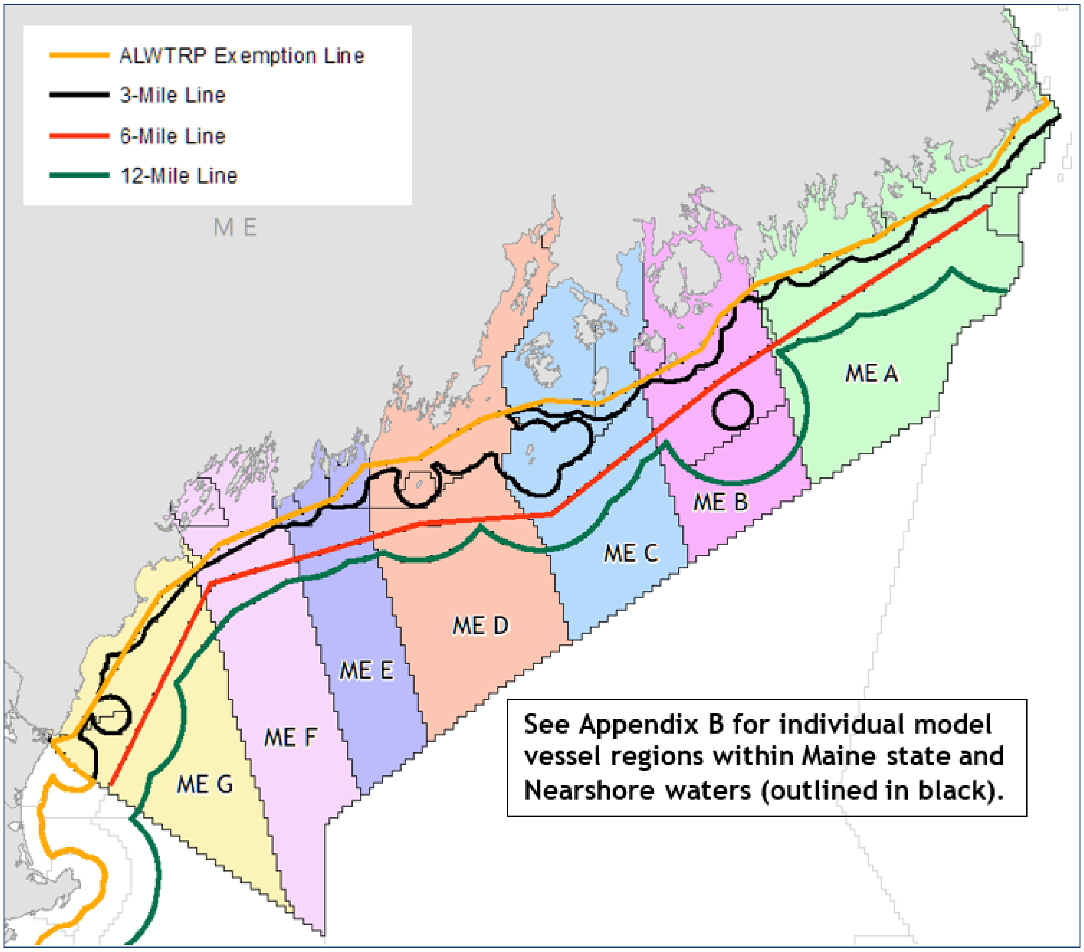


EXHIBIT ME- 2. ESTIMATED NUMBER OF ACTIVE LOBSTER VESSELS IN MAINE STATE AND NEARSHORE WATERS (2017)

AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Maine State Zone A 0-3 Miles	86	34	52	180	337	492	786	828	786	714	550	235
Maine State Zone B 0-3 Miles	86	60	68	140	232	310	483	537	496	430	329	215
Maine State Zone C 0-3 Miles	146	111	114	223	346	472	652	709	693	626	547	309
Maine State Zone D 0-3 Miles	161	92	91	180	318	511	721	754	718	697	587	362
Maine State Zone E 0-3 Miles	125	83	65	87	149	233	311	327	285	282	250	185
Maine State Zone F 0-3 Miles	142	89	101	117	178	347	498	507	482	457	403	274
Maine State Zone G 0-3 Miles	47	35	32	59	103	135	153	165	151	140	107	81
Maine State Zone A 3-12 Miles	46	27	35	54	85	93	112	112	116	113	104	87
Maine State Zone B 3-12 Miles	38	8	20	30	36	44	48	45	56	58	63	50
Maine State Zone C 3-12 Miles	66	39	38	52	47	49	41	35	44	58	64	67
Maine State Zone D 3-12 Miles	43	28	40	41	55	43	40	49	52	50	58	52
Maine State Zone E 3-12 Miles	34	21	32	26	28	21	12	17	29	29	30	28
Maine State Zone F 3-12 Miles	60	44	34	36	25	29	19	20	20	20	24	25
Maine State Zone G 3-12 Miles	35	21	23	39	41	36	35	34	39	40	44	44
Maine State Zone A 12+ Miles	46	31	27	37	31	34	24	22	21	25	38	36
Maine State Zone B 12+ Miles	14	12	9	11	12	10	10	3	2	7	4	4
Maine State Zone C 12+ Miles	15	16	21	18	16	17	15	12	12	11	14	16
Maine State Zone D 12+ Miles	55	35	39	55	46	42	37	35	37	42	44	44
Maine State Zone E 12+ Miles	23	25	24	23	14	12	13	13	9	9	9	16
Maine State Zone F 12+ Miles	15	23	22	16	6	8	8	10	11	17	12	18
Maine State Zone G 12+ Miles	11	11	9	8	6	5	5	5	6	5	5	6

Distributional Approach

The two parameters of primary interest in specifying model vessels for the Maine lobster fishery are the number of traps fished per vessel and the number of traps fished per trawl. The Harvester data indicate the total number of traps that a vessel fished at the time of the trip recorded.[23] The model calculates the average number of traps fished for each vessel in each month/area combination. To specify a distribution for these parameters, we create several categories or bins for classifying data records. For traps fished per vessel, we use the following categories for the specification of model vessels: 1-100, 101-300, 301-500, 501-700, and 701 or more traps.

The Harvester survey does not require lobstermen to explicitly report traps per trawl; however, traps per trawl can be reasonably inferred from reported information. Fishermen report the total number of traps hauled in a given trip, as well as the number of hauls performed. Dividing a vessel's total traps hauled in a month by the total number of hauls provides an estimate of average traps per trawl. The model assumes, based on ALWTRP requirements, that if the traps-per-haul figure is five or less, the vessel fishes with one endline per trawl. If the traps per haul figure is greater than five, we assume two endlines are used.

[23] Note that the total gear figure is distinct from the quantity of gear hauled in a given trip, which is also reported.

Over the last several years, Maine has instituted trap and trawl-length maximums in specific locations along the coast. The model incorporates these regions and applies the maximums that Maine has specified in characterizing activity within them. These exception areas override any gear configuration information based on the Harvester data.

For traps per trawl, the model uses the following categories for the specification of model vessels: 1, 2, 3- 4, 5-9, 10-14, 15-19, 20-39, and 40+ traps per trawl.

Table ME-3 incorporates the categories specified above to illustrate the application of the approach to characterizing gear use. The table shows, for a hypothetical area and month, the percentage of vessels that fish a given combination of traps and traps per trawl. In this case, for instance, 20 percent of vessels fish 101 to 300 traps, configured in trawls of 10 to 14 traps. The model employs matrices like this to characterize the baseline distribution of gear use in specified areas off the Maine coast. The distribution for each area varies on a monthly basis, reflecting the monthly variation in gear configurations reported in the Harvester data.

EXHIBIT ME- 3. DISTRIBUTION OF VESSELS FISHING A GIVEN CONFIGURATION OF GEAR FOR A HYPOTHETICAL AREA AND MONTH

TRAPS PER TRAWL	TRAPS PER VESSEL					
	1-100 TRAPS	101-300 TRAPS	301-500 TRAPS	501-700 TRAPS	MORE THAN 700 TRAPS	TOTAL
1						
2						
3-4	10%	15%	15%	10%		50%
5-9			5%			5%
10-14	10%	20%	10%			40%
15-19						
20-39						
40+					5%	5%
Total	20%	35%	30%	10%	5%	100%

Appendix C presents the distribution of gear configurations for all states where the distributional approach is applied (including Maine). The table shows each model vessel area and month combination, and the percentage distribution of vessels to each gear configuration bin (i.e., the combination of traps fished and traps per trawl).

Model Vessel Parameters

To calculate the number of vertical lines deployed, the model must apply specific numerical values to parameters specified with ranges. For example, for the traps per trawl variable, we need to assign numerical values to the "10 to 14" range, etc. To do so, we calculate the average traps per trawl for all responses in the range, across all months. We do the same for the number of traps fished, calculating an average number of traps for each of the ranges. The model applies separate sets of point estimates for state waters (0-3 miles from shore) and for nearshore waters (beyond three miles). Exhibit ME-4 summarizes the resulting values. It is essential to keep in mind that these are averages *within* each range. The model recognizes that gear configurations vary seasonally and by area, incorporating this variation through the distribution of active vessels to different model vessels (i.e., different combinations of traps and traps-per-trawl).

EXHIBIT ME- 4. POINT ESTIMATES APPLIED FOR GEAR CONFIGURATION RANGES

VARIABLE	RANGE	STATE WATERS (0-3 MILES)	NEARSHORE WATERS (BEYOND 3 MILES)
Traps per Trawl	3-4	3.6	3.5
	5-9	6.9	6.8
	10-14	10.9	11.5
	15-19	16.8	16.3
	20-39	21.0	20.9
	40+	NA	NA
Number of Traps Fished	1-100 Traps	31.4	54.2
	101-300 Traps	200.3	213.5
	301-500 Traps	410.9	409.5
	501-700 Traps	602.7	604.9
	701+ Traps	782.8	789.8

Note: Over the last few years, Maine implemented regulations limiting trawl length and traps fished in several geographic areas. In these areas, the distribution of model vessels is modified to comport to these regulatory limits.

NEW HAMPSHIRE

The discussion below explains the model's characterization of the activity and gear associated with lobster vessels fishing in New Hampshire state waters.[24]

Number of Active Lobster Vessels

The New Hampshire Fish and Game Department (FGD) requires that fishermen who land no more than 1,000 pounds of lobster in a calendar year file an Annual Lobster Harvester Report, which includes a monthly summary of fishing activity. Fishermen who land over 1,000 pounds must file a Lobster Fisherman and Dealer Reporting Form, which includes trip-level data. To avoid double-counting activity captured in Federal datasets, we remove records for fishermen who also report to the Federal Vessel Trip Reporting (VTR) system.

The model assigns the activity of state-licensed vessels based on the location of activity reported by each vessel. The state reporting areas subject to the ALWTRP include the Isle of Shoals, Seabrook, Gulf of Maine, Rye, and Hampton; all other fishing areas are located landward of the ALWTRP exemption line. Vessels that fish more than one sub-area are counted only once to provide a more accurate count of vessels that are active in each of the two major areas: the state's inland bays and its Atlantic waters.

Exhibit NH-1 presents the resulting data on the number of vessels active in NH waters in each month of 2017.

EXHIBIT NH- 1. ESTIMATED NUMBER OF VESSELS ACTIVE IN NE W HAMPSHIRE STATE WATERS (2017)

WATERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Inland Bays	3	4	5	8	28	53	60	57	57	46	23	10
Atlantic Waters	13	8	8	20	57	109	137	136	120	78	44	27

Gear Configurations For Model Vessels

Lobster

As with other northeast states, the vertical line model applies a distributional approach to characterize gear configurations used by New Hampshire lobster vessels. Rather than estimate the concentration of vertical line based on a single model vessel designed to represent the average or typical configuration of gear, the model specifies multiple model vessels – representing the full range of gear configurations currently in use – and specifies the percentage of active vessels to which each configuration applies. We develop separate distributions for the Inland Bays and Atlantic waters areas, all of which were exempted from the ALWTRP plan trawl requirements during the last rulemaking.

[24] The NH Fish and Game Department (NH FGD) indicates that OTP activity within NH waters is relatively minor. NH FGD does not maintain a separate reporting system for the OTP fishery. Instead, OTP fishermen use the forms developed for the lobster fishery. The NH data do not differentiate between lobster and OTP activity; therefore, any OTP activity is subsumed within estimates of activity for the lobster fishery. Furthermore, in past years, a small number of gillnet vessels were also active in New Hampshire state waters. Recently, activity has been minimal and FGD provided no gillnet information for 2017.

The specification of each model vessel includes the total number of traps that the vessel fishes and the number of traps fished per trawl. To assist with development of gear configurations, NH FGD provided an additional data set reflecting supplementary monthly data gathering in 2017. In these supplementary reports, fishermen provided an average of total traps and total buoy lines fished per month. Linking by ID number, we appended these data to the 2017 Harvester and Dealer reporting data. We used the resulting data set to calculate model vessel gear configuration parameters. Specifically, the trip-level data are used to estimate the traps-per-trawl configuration that each vessel fishes in each month, while the supplementary data provide the number of traps that the vessel fishes in the month.

The merged data allow us to cross-tabulate traps per vessel and traps per trawl, estimating the percentage of vessels that fish different configurations. To define model vessels, the model uses the following categories or bins for traps per trawl: 1, 2, 3, 4-5, 6-9, 10-15, and 16+ traps per trawl. The model assumes that if the traps-per-haul figure is five or less, the vessel fishes with one endline per trawl. If the traps per haul figure is greater than five, we assume two endlines are used.

Likewise, the model establishes ranges for the traps fished per vessel: 1-100, 101-300, 301-500, 501-800, and 801+. We develop a separate gear distribution for each month and area. As a result, for example, the data suggest that about 13 percent of all vessels fishing in the Inland Bays area in May fish 1 to 100 traps configured as doubles.

To calculate the number of vertical lines deployed, the model must apply specific numerical values to parameters specified with ranges. For example, for the traps per trawl variable, we need to assign numerical values to the "4-5" range, the "6-9" range, etc. To do so, we calculate the average traps per trawl for all responses in the range, across all months. We do the same for the number of traps fished, calculating an average number of traps for each of the ranges. Exhibit NH-2 summarizes the resulting values.

EXHIBIT NH- 2. POINT ESTIMATES APPLIED FOR GEAR CONFIGURATION RANGES

PARAMETER	RANGE	INLAND BAYS	ATLANTIC WATERS
Traps per Trawl	4 to 5	4.3	4.8
	6 to 9	6.2	7.8
	10 to 15	10	10.2
	16+	NA	18.3
Number of Traps Fished	0-100	35.7	37.6
	101-300	202.7	206.0
	301-500	436.3	414.2
	501-800	674.2	625.1
	801+	1,065.4	1,057.1

As noted, New Hampshire fishermen explicitly report the number of buoy lines per vessel. While the vertical line estimation methodology is needed to allow testing of alternative gear configuration scenarios, it yields estimates that differ slightly from the actual buoy line counts in the FGD data. To address this discrepancy, the model employs a simple calibration process to scale the endline estimates to the reported values. To accomplish this, we employed the ratio of reported endline counts to the modeled results to create a set of monthly calibration scalers. The model uses the scalers to adjust the baseline up or down to equal the reported endline counts for each area.

Appendix C presents the distribution of gear configurations for all states where the distributional approach is applied (including New Hampshire). The table shows each model vessel area and month combination, and the percentage distribution of vessels to each gear configuration bin (i.e., the combination of traps fished and traps per trawl).

MASSACHUSETTS

The discussion below explains the model's characterization of the activity and gear associated with lobster, gillnet, and other trap/pot vessels fishing in Massachusetts waters.

Data Overv iew

The Massachusetts Division of Marine Fisheries (DMF) provided detailed vessel-level data to support development of the vertical line model. Merging information from the trip-level and annual reporting components of its Catch Report data, DMF provided a comprehensive database of activity and gear configurations for all fixed-gear fisheries (lobster, gillnet, and other trap/pot).[25] The data provide monthly, vessel-level information on quantity of gear fished, number of endlines, and fishing location as indicated by Massachusetts statistical reporting area (SRA). Exhibit MA-1 provides a map of the Massachusetts SRAs. The model incorporates the data reflecting fishing activity and gear in 2017.

Number of Active Vessels

The model uses the 2017 DMF data to calculate the number of vessels active in state waters (i.e., inshore SRAs 1 through 14). To avoid double-counting federally permitted vessels, we remove all vessels that report to the Northeast Vessel Trip Report (VTR) system. In addition, the DMF data incorporate Federal vessels operating in SRAs outside of state waters. For several nearshore SRAs – 16 through 20 – the DMF data provide a preferred source for developing a count of active lobster vessels (many of which do not report to VTR). For all areas, the model assumes that the activity of each of the remaining vessels is evenly distributed throughout the area(s) is which the activity is reported. Exhibit MA-2 presents the number of active vessels in 2017 by month and area for each of the three major fisheries (lobster, gillnet, other trap/pot).[26]

[25] DMF removed all confidential information on vessel identity and assigned each vessel a generic identification number.

[26] The table excludes SRAs in which the vessels of interest reported no activity.

EXHIBIT MA- 1 . MASSACHUSETTS STATISTICAL REPORTING AREAS

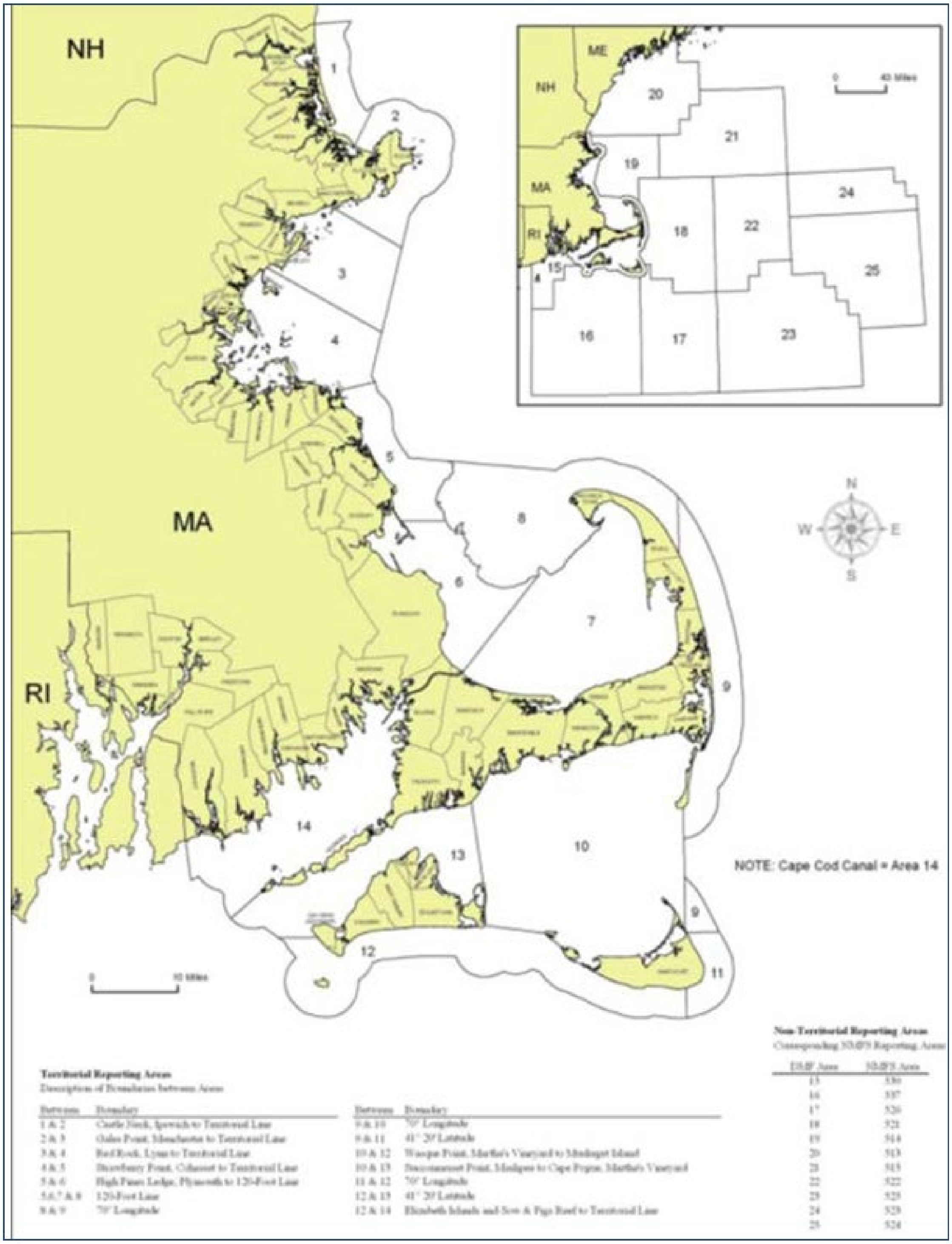


EXHIBIT MA- 2. ESTIMATED NUMBER OF ACTIVE VESSELS (2017)

FISHERY	AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lobster Trap	SRA 1	1	2	1	5	11	16	31	32	26	23	12	7
	SRA 2	34	20	15	32	54	85	108	113	112	101	77	60
	SRA 3	20	7	5	18	45	74	86	88	82	74	68	42
	SRA 4	18	5	6	28	48	77	99	106	102	99	84	53
	SRA 5	10	2	5	10	44	49	59	59	58	54	50	32
	SRA 6	5	0	0	0	40	53	63	60	59	53	44	26
	SRA 7	1	1	0	0	23	40	54	61	57	53	39	17
	SRA 8	7	1	0	0	9	19	26	28	25	21	20	10
	SRA 9	0	0	0	0	11	29	33	33	29	27	21	3
	SRA 10	0	0	0	0	1	1	1	0	1	0	0	0
	SRA 11	0	0	0	0	0	0	0	0	0	0	0	0
	SRA 12	5	4	4	6	6	7	9	7	5	3	2	3
	SRA 13	3	4	6	8	10	14	18	15	9	6	3	5
	SRA 14	4	4	5	10	12	15	16	12	7	4	3	6
	SRA 16	4	3	2	3	4	7	8	8	10	9	7	7
	SRA 17	0	0	0	0	1	1	1	1	1	1	1	0
	SRA 18	0	0	0	0	2	3	4	5	5	5	4	4
	SRA 19	28	12	11	15	23	16	15	22	28	37	40	33
	SRA 20	4	4	4	3	3	4	1	1	1	2	2	2
Gillnet	SRA 2	1	1	0	0	0	0	0	0	3	2	1	1
	SRA 3	0	0	0	3	2	5	3	3	4	2	0	0
	SRA 4	0	0	0	5	7	7	7	7	2	0	0	0
	SRA 5	0	0	0	1	2	3	2	2	0	0	0	0
	SRA 9	0	0	0	0	1	1	1	0	0	0	0	0
OTP	SRA 7	0	0	0	0	2	2	3	5	7	4	3	0
	SRA 9	0	0	0	0	0	0	1	0	0	0	0	0
	SRA 10	0	0	0	4	12	10	20	20	25	25	21	9
	SRA 12	0	0	0	1	2	3	5	5	6	1	0	0
	SRA 13	0	0	0	0	5	10	17	14	15	13	8	2
	SRA 14	0	0	0	5	13	19	24	20	20	28	20	16

Gear Configurations for Model Vessels

To properly reflect the size and complexity of the Massachusetts lobster fishery, the model defines multiple model vessels for each area – representing the full range of gear configurations currently in use – and specifies the percentage of active vessels within the area to which each configuration applies. The discussion below describes the analysis in greater detail.

Lobster Vessel Gear Configurations

The two parameters of primary interest in specifying model vessels for the Massachusetts lobster fishery are the number of traps fished per vessel and the number of traps fished per trawl. Massachusetts lobstermen do not explicitly report traps per trawl; they do, however, report the number of traps they fished and the number of vertical lines they employed. We combine this information to estimate traps per trawl. We first divide the number of pots fished by the number of lines fished to calculate the number of traps per line. Consistent with DMF guidance and the current ALWTRP, we assume that if the traps-per- line figure is less than or equal to three, the vessel fishes with one endline per trawl. If the traps per line figure is four or greater, we assume two endlines are used. The traps per trawl estimates are derived by multiplying the number of traps per line by the assumed lines per trawl. We calculate traps per trawl individually for each record in the database.[27] To define model vessels, the model uses the following categories or bins for traps per trawl: 1, 2, 3, 4-5, 6-9, 10-14, 15-19, and 20+ traps per trawl.

The second dimension in defining model vessels is the number of traps per vessel. Based on a review of the distribution of the average traps fished per vessel during the year, we define the following bins: 0-99, 100-299, 300-499, 500-799, and 800+.

Exhibit MA-3 incorporates the categories specified above to illustrate the application of the gear characterization approach. The table shows, for a hypothetical area and month, the percentage of vessels that fish a given combination of traps and traps per trawl. In this case, for instance, 20 percent of vessels fish 100 to 299 traps, configured as singles. The model employs matrices like this to characterize the baseline distribution of gear use in Massachusetts inshore lobster areas. The distribution for each area varies on a monthly basis, reflecting the monthly variation in gear configurations reported in the data.

EXHIBIT MA- 3. DISTRIBUTION OF LOBSTER VESSELS FISHING A GIVEN CONFIGURATION OF GEAR FOR A HYPOTHETICAL AREA AND MONTH

0	TRAPS PER VESSEL					
	0-99 TRAPS	100-299 TRAPS	300-499 TRAPS	500-799 TRAPS	MORE THAN 800 TRAPS	TOTAL
1		20%	10%	10%		40%
2			5%	10%		15%
3				5%		5%
4-5						
6 to 9				5%		5%
10 to 14				10%	5%	15%
15 to 19				10%	5%	15%
20+					5%	5%
Total		20%	15%	50%	15%	100%

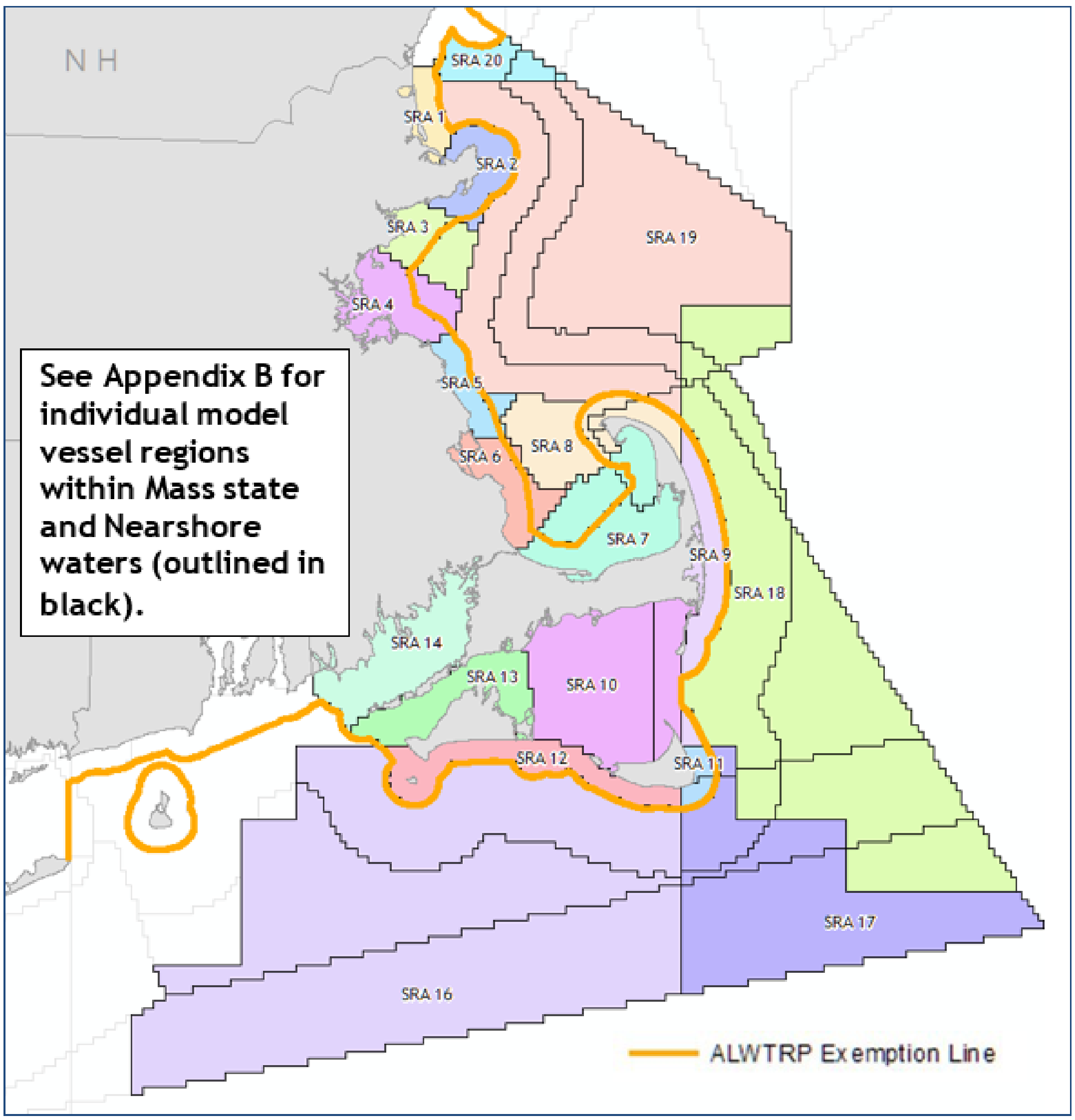
Appendix C presents the distribution of gear configurations for all states where the distributional approach is applied (including Massachusetts). The table shows each model vessel area and month combination, and the percentage distribution of vessels to each gear configuration bin (i.e., the combination of traps fished and traps per trawl). In calculating the distributions, the model consolidates SRA 10 through 13, as activity is relatively light.

[27] Note that this method necessarily leads to a "gap" in the estimate of traps per trawl; specifically, it yields no individual records where a vessel fishes four to five traps per trawl. Limited instances of four to five traps per trawl occur in the frequency distribution because of averaging performed across months for each vessel.

Model Vessel Areas

The model must specify the areas to which a given distribution of gear configurations apply. Model vessels assigned in Massachusetts consider the LMAs and ALWTRP regulations, which as of the most recent rulemaking, exempted most Massachusetts waters from minimum trap-per-trawl requirements. The model also takes advantage of the Massachusetts data to develop distributions that characterize the current configuration of lobster gear in several areas beyond state waters: SRAs 16, 18, 19, and 20. The state dataset covers vessel activity in these nearshore waters. In the absence of similarly detailed information from Federal sources or from other states, the Massachusetts data provide the best available source of information on the configuration of lobster gear in these areas. Exhibit MA-4 demonstrates the model vessel regions assigned in Massachusetts waters.

EXHIBIT MA- 4. MASSACHUSETTS MODEL VESSEL AREAS IN STATE AND NEARSHORE WATERS



Estimation of Vertical Lines

To estimate vertical line use in a given area and month, the model applies the specified distribution of gear configurations to the number of vessels reported to be active at that place and time. For instance, if the estimate of active vessels fishing in SRA 2 in September is 122, the model applies the mix of gear configurations calculated for September Area 2 to these 122 active vessels.

To calculate the number of vertical lines deployed, the model must apply specific numerical values to parameters specified with ranges. For example, for the traps-per-trawl variable, we need to assign a numerical value to the "6 to 9" range. Based on a review of the data and recommendations from MA DMF, we calculate the average traps per trawl across all months for three inshore areas: SRAs 1 through 8; SRA 9; and SRAs 10 through 14. We do the same for the number of traps fished, calculating an average number of traps for each of the ranges for each inshore area. In addition to the inshore figures, we develop separate gear configuration parameters for the three nearshore areas (SRAs 15/16, 17/18, and 19/20). Exhibit MA-5 summarizes the resulting values. We compared the variation in averages between areas and months, and found the variation to be limited. Hence, we apply these values to all months and all areas. It is essential to keep in mind that these are averages within each range. The model recognizes that gear configurations vary seasonally and by area, and captures this variation by employing a different distribution of gear configurations (i.e., different combinations of traps and traps-per-trawl) for each area and month.

EXHIBIT MA- 5 . POINT ESTIMATES APPLIED FOR GEAR CONFIGURATION RANGES

PARAMETER	RANGE	INSHORE SRA 1-8	INSHORE SRA 9	INSHORE SRA 10-14	NEARSHORE SRA 15/16	NEARSHORE SRA 17/18	NEARSHORE SRA 19/20
Traps per Trawl	6 to 9	7.7	8.3	7.7	NA	NA	NA
	10 to 14	10.5	11.8	12.6	10.8	11.2	10.5
	15 to 19	15.9	16.0	16.2	16.5	17.1	16.5
	20+	31.9	32.2	35.0	44.6	39.1	35.8
Number of Traps Fished	0-99	47.4	59.4	54.6	54.6	NA	45.0
	100-299	184.7	204.2	169.1	185.0	172.9	187.9
	300-499	372.6	386.2	371.6	372.1	389.2	366.8
	500-799	629.8	618.4	665.9	617.2	690.1	639.4
	800+	800.0	800.0	800	1,314.8	1,386.5	800.2

Buoy Line Scalar

As noted, Massachusetts lobstermen explicitly report the number of buoy lines per vessel. While the vertical line estimation methodology is needed to test alternative gear configuration scenarios, it yields estimates that differ slightly from the actual buoy line counts in the DMF data. To address this discrepancy, the model employs a simple calibration process to scale the endline estimates to the reported values. We estimate the ratio of reported endline counts to the modeled results to create a set of monthly calibration scalers. The model uses the scalers to adjust the baseline up or down to equal the reported endline counts for each area. These scalars are applied only in state waters, where the endline counts provided are largely complete and self-contained.

Model Vessels for Gillnet And OTP Fisheries

In addition to the lobster fishery, the ALWTRP also covers two other fisheries active in Massachusetts waters: the gillnet fishery and the other trap/pot (OTP) fishery. We characterize model vessel gear configurations for these fisheries as described below.

Gillnet

Relatively few gillnet vessels operate in Massachusetts state waters, so the model applies simplified gear configuration assumptions. The key gear configuration parameter for gillnet vessels is the number of strings per vessel. Since the vessel-level data include the number of buoy lines per vessel, we can use the 2017 DMF data to estimate the number of strings per vessel by dividing the buoy line figure by two (i.e., by assuming two vertical lines per string). The model applies an average strings per vessel of five for all inshore waters in all months. For nearshore SRAs, the average number of strings per vessel is 19.

Other Trap/ Pot

The model characterizes gear use in the OTP sector based on data for the two major OTP fisheries in Massachusetts: fish pots and conch pots. Using 2017 data, we calculate the number of traps per vessel and traps per trawl for these fisheries.[28] Seeing limited seasonal variation in these figures, the model applies simple year-round averages for the key gear parameters. Geographic variation is captured by developing separate values for three sets of waters: state waters in SRAs 1 through 8; state waters for SRAs 9-14; and nearshore waters (SRAs 16 through 20). These estimates are presented in Exhibit MA-6.

EXHIBIT MA- 6 . GEAR CONFIGURATION PARAMETERS FOR OTP FISHERIES

WATERS	FISHERY	NUMBER OF TRAPS PER VESSEL	TRAPS PER TRAWL	NUMBER OF ENDLINES PER TRAWL
Inshore SRAs 1-8 Exempt waters	Fish Pots	104	1	1
	Conch Pots	118	2.5	1
Inshore SRAs 1-8	Fish Pots	104	2	1
	Conch Pots	118	2.5	1
Inshore SRAs 9-14	Fish Pots	121	18.5	2
	Conch Pots	150	3.7	2
Nearshore	Fish Pots	213	44.2	2
	Conch Pots	166	10	2

[28] We calculate traps per trawl using the method described above for the lobster fishery.

The model applies these gear configuration parameters to all vessels that report some form of OTP activity, based on an estimate of the seasonal distribution of activity between the two fisheries. This distribution is shown in Exhibit MA-7. For instance, in October in SRAs 1 through 8, the model assumes that 40 percent of all OTP vessels use the fish pot configuration, while the other 60 percent use the conch pot configuration.

EXHIBIT MA- 7 . DISTRIBUTION OF OTP GEAR CONFIGURATIONS, BY MONTH

WATERS	FISHERY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Inshore SRAs 1-8	Fish Pots	0	0	0	0	0	0	0.5	0.5	0.5	0.4	0.4	0.4
	Conch Pots	1	1	1	1	1	1	0.5	0.5	0.5	0.6	0.6	0.6
Inshore SRAs 9-14	Fish Pots	0	0	0	0	0.12	0.19	0.56	0.69	0.51	0.27	0.02	0
	Conch Pots	1	1	1	1	0.88	0.81	0.44	0.31	0.49	0.73	0.98	1
Nearshor	Fish Pots	0	0	0	0	0	0	0.67	0.7	0.67	0.36	0	0
	Conch Pots	1	1	1	1	1	1	0.33	0.3	0.33	0.64	1	1

RHODE ISLAND

The discussion below explains the model's characterization of the activity and gear associated with vessels fishing in Rhode Island state waters.

Number of Active Vessels

The Rhode Island DEM Division of Marine Fisheries provided 2017 vessel-level data from its state logbook program. Fishermen submitting these trip-level logbook reports hold state permits, although the data include Federal lobster permit holders fishing in RI state waters. We use these data to calculate the number of lobster, gillnet, and other trap/pot (OTP) vessels fishing in the state-waters portion of NMFS statistical areas 538/539 (Narragansett Bay, RI coastal waters, and the southern Cape Cod area) and 611 (RI coastal waters adjacent to Long Island Sound). Exhibit RI-1 shows the location of these areas.

The vessel activity recorded in these areas includes all vessels holding only a state permit, as well as a portion of Federal permit holders who report fishing in the overall NMFS statistical area. The latter are evenly distributed to the statistical area, with a subset assigned to the state-waters portion of the overall statistical area. Exhibit RI-2 summarizes the activity data for 2017.

The OTP fishery includes vessels harvesting black sea bass, scup, eel, and conch. A single OTP fisherman may harvest multiple species; therefore, the logbook data do not allow disaggregation of these segments of the OTP fishery. However, DEM Marine Fisheries staff indicate that the scup fishery is open year-round and has a large quota; therefore, fishermen primarily target scup. Black sea bass are also harvested, but this activity is limited by a small quota and frequent closures.

EXHIBIT RI - 1. RI STATE MODEL VESSEL AREAS AND NEARBY NMFS STATISTICAL AREAS

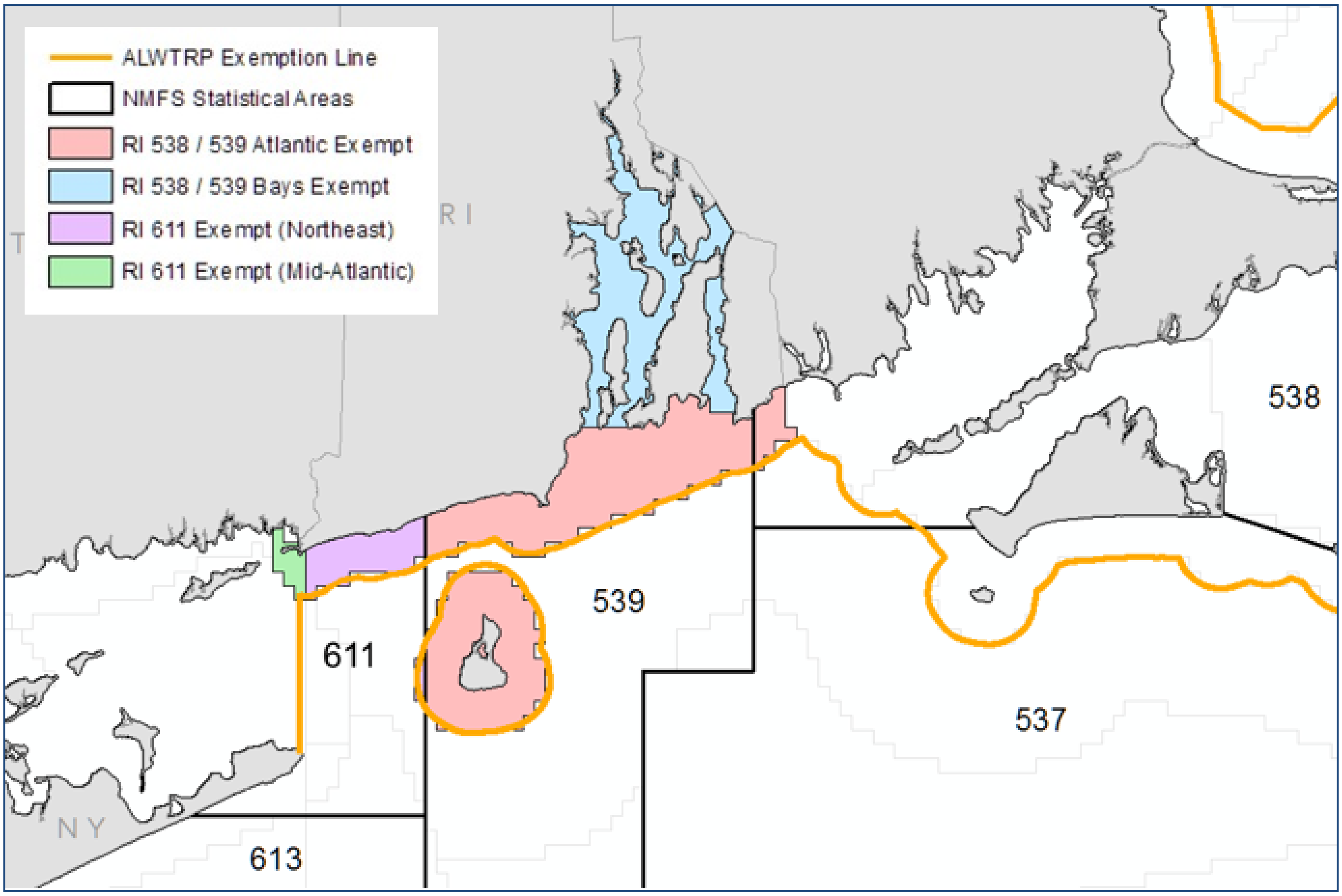


EXHIBIT RI- 2 . VESSELS ACTIVE IN RHODE ISLAND STATE WATERS, BY MONTH (2017)

FISHERY	AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lobster	RI 538/539 State Waters	10	6	9	17	34	57	67	54	32	20	19	17
	RI 611 State Waters	0	0	0	1	2	4	6	5	4	0	0	0
Gillnet	RI 539 State Waters	2	0	0	9	18	19	15	12	10	11	8	2
OTP	RI 539 State Waters	1	1	1	2	19	20	24	13	13	13	6	1
	RI 611 State Waters	0	0	0	0	0	1	1	0	2	2	1	0

Gear Configurations For Model Vessels

Lobster

As with other northeast states, the vertical line model applies a distributional approach to characterize gear configurations used by RI lobster vessels. Rather than estimate the concentration of vertical line based on a single model vessel designed to represent the average or typical configuration of gear, the model specifies multiple model vessels – representing the full range of gear configurations currently in use – and specifies the percentage of active lobster vessels to which each configuration applies.

- **Gear Configuration Parameters.** The specification of each model vessel includes the total number of traps that the vessel fishes and the number of traps fished per trawl. The RI logbook data allow us to characterize the average number of traps that each lobster vessel fishes in a given month. Each vessel fishing in nearshore waters is assigned to one of the following traps- per-vessel categories: 1-100, 101-500, 501-800, or 801+. While the logbook data do not explicitly report traps per trawl, RI fisheries experts suggest that vessels with a large trap allocation tend to fish longer trawls, while vessels with small allocations fish singles. We use trap allocation as a proxy for trawl configuration, applying the following assumptions recommended by RI DEM: vessels allocated 50 or fewer traps are likely to fish singles; vessels allocated 51 to 100 traps are likely to fish five-trap trawls; vessels allocated 101 to 200 traps are likely to fish 10-trap trawls; and vessels allocated 201 or more traps are likely to fish 15-trap trawls.
- **Gear Distributions.** We cross-tabulate traps per vessel and traps per trawl, estimating the percentage of vessels that fish different configurations. We develop a separate gear distribution for each month for each of the two areas (538/539 and 611). As a result, for example, the data suggest that in Area 538/539, about six percent of all vessels active in May fish 1 to 100 traps in 10-trap trawls.
- **Point Estimates.** To calculate the number of vertical lines deployed, the model must apply specific numerical values to parameters specified with ranges. Exhibit RI-3 summarizes the point estimate figures estimated in Rhode Island, with data pooled for both model vessel areas. These point estimates are combined with the percentage gear distributions to estimate the number of endlines for each month/area combination.
- **Endlines per Trawl.** Vessels fishing five-trap trawls are assumed to use one endline, while longer trawls are fished with two endlines.
- **Anchor Lines.** Consistent with findings for surrounding states, we assume that anchor lines are not used.
- Appendix C presents the distribution of gear configurations for all states where the distributional approach is applied (including Rhode Island). The table shows each model vessel area and month combination, and the percentage distribution of vessels to each gear configuration bin (i.e., the combination of traps fished and traps per trawl).

EXHIBIT RI- 3 . POINT ESTIMATES FOR LOBSTER GEAR QUANTITY FISHED (2017)

TRAPS FISHED CATEGORY	1 TRAP PER TRAWL	5 TRAPS PER TRAWL	10 TRAPS PER TRAWL	15 TRAPS PER TRAWL
1 to 100	22.4	34.0	48.3	50.2
101 to 500	NA	104.0	209.5	297.1
501 to 800	NA	NA	NA	728.7
801+	NA	NA	NA	1,525.0

Gillnet

- **Total Strings Fished.** The characterization of the Rhode Island gillnet fishery is based on a single model vessel that represents gillnet operations in area 539. The specifications for this vessel include the number of gillnet strings fished. Based on analysis of the 2017 logbook data, the model incorporates the assumption that each vessel in state waters fishes an average of 5.7 strings.
- **Other.** The model assumes two surface lines and two 10-foot anchor lines for each gillnet string.

Other Trap/ Pot

- **Total Traps Fished.** The model specifies a single model vessel to characterize OTP activity in Rhode Island state waters. The specification of each model vessel includes the total number of traps that the vessel fishes. On averaged over all months, OTP vessels in the region fish 36 pots each.
- **Traps per Trawl.** No Rhode Island-specific data are currently available to characterize the number of pots fished per trawl in the OTP fishery. However, RI DEM indicates that the fishery primarily targets scup, which typically are harvested using single traps. Therefore, we assume single traps for all vessels active in the OTP fishery. As noted, fishermen also use trap gear to harvest black sea bass in limited quantities. These traps are typically fished in trawls; as a result, the model may slightly overstate the number of vertical lines associated with the Rhode Island OTP fishery.

CONNECTICUT

The discussion below explains the model's characterization of the activity and gear associated with lobster, gillnet, and other trap/pot vessels fishing exclusively in Connecticut state waters. All data included in the model reflect 2016 fishing activity. The Connecticut Department of Environmental Protection (CT DEP) was unable to provide data for more recent years.

Number of Active Vessels

Lobster

- Exhibit CT-1 provides a map of the three major fishing areas in Connecticut state waters.[29] CT DEP analyzed catch report data to identify the number of lobster vessels active in Connecticut waters, organizing the data by month and fishing area. Exhibit CT-2 summarizes the data for 2016.

Other Trap/ Pot

- A small fish pot fishery operates in Long Island Sound, focusing on scup, tautog, and black sea bass. Exhibit CT-2 summarizes activity in this fishery in 2016. When only one or two vessels report activity, the data are withheld. The model assumes 1.5 active vessels in these instances.

Gillnet

- Historically, a small staked gillnet fishery has operated in Connecticut state waters. Because of limited participation, all data in 2016 were withheld. Therefore, the model assumes no gillnetting activity in Connecticut state waters, possibly understating vertical lines to a small degree.

GEAR CONFIGURATIONS FOR MODEL VESSELS

Lobster

- **Total Traps Fished**: The specification of each model vessel includes the total number of traps that the vessel fishes. CT DEP analyzed catch report data from 2016 to calculate the total number of lobster pots fished each month in each of the three areas that comprise the state's waters. To estimate the mean number of traps per vessel, we divide the total number of traps in each month/area by the number of active vessels in each month/area. The model vessels for Connecticut incorporate the resulting figures, as shown in Exhibit CT-3.[30]
- **Traps per Trawl**: Each model vessel incorporates an estimate of the number of traps per trawl. CT DEP reports that lobster vessels in state waters may fish singles or trawls of up to 12 traps. Consistent with CT DEP recommendations, the model vessels for all three state water areas assume the use of six-trap trawls.
- **Endlines per Trawl**: Based on input from CT DEP, we assume two endlines per trawl.
- **Anchor Lines**: Consistent with CT DEP recommendations, we assume that anchor lines are not used.

[29] CT DEP typically uses the terms Western LIS, Central Basin, and Eastern Basin, respectively, for these same areas. For simplicity, as shown in Exhibit CT-1, the model uses the terms Long Island Sound West, Central, and East.

[30] In several instances, data on number of traps fished are withheld. In these cases, the model incorporates an average number of traps per vessel based on the adjacent months for which data are available. For instance, if no data are available for November, the model uses an average of the number of traps per vessel in October and December.

Other Trap/ Pot

- **Pots Fished per Vessel**: CT DEP analyzed catch report data to calculate the total number of fish pots fished by month and geographic area. To estimate the typical number of traps per model vessel, we divide this total by the number of active vessels in each month/area. The data suggest that fish pot vessels fished an average of 25 pots per vessel in 2016.
- **Other**: Consistent with CT DEP guidance, we assume that all pots are fished as singles, with one endline.

EXHIBIT CT- 1. MODEL VESSEL AREAS IN CONNECTICUT STATE WATERS

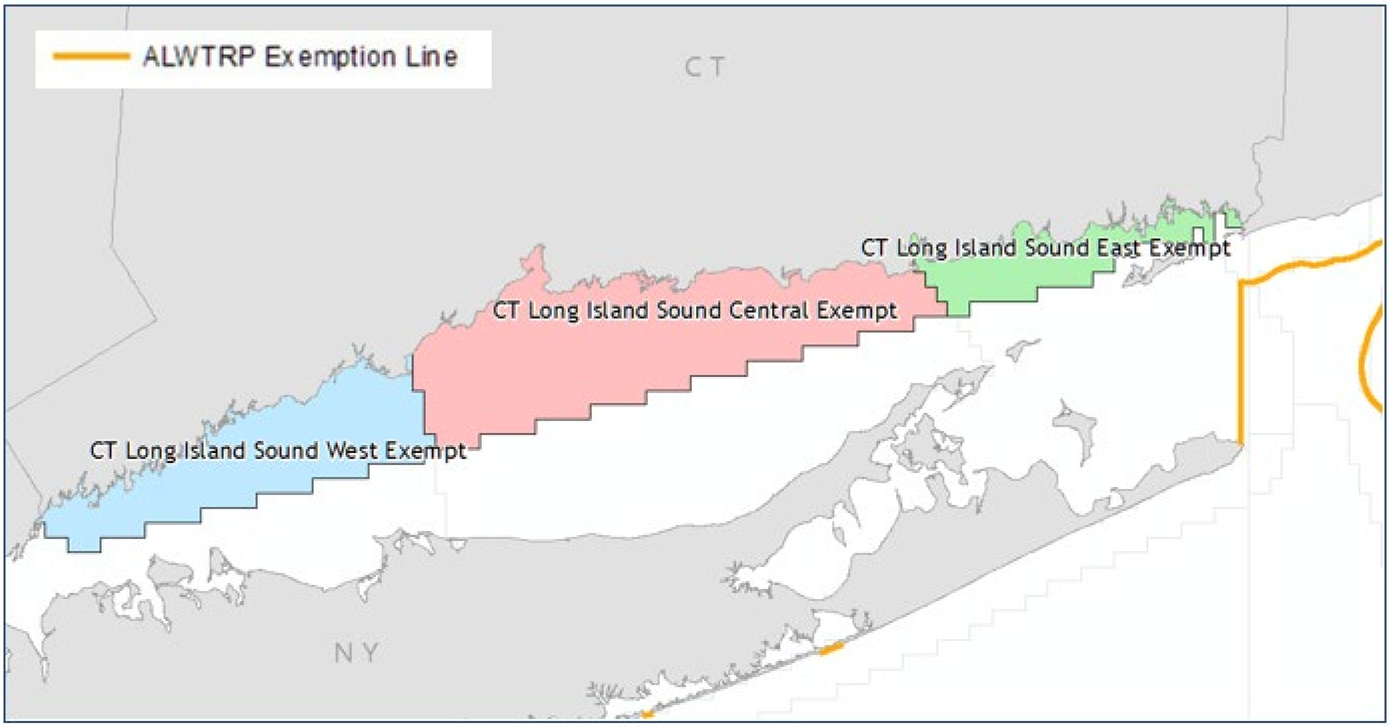


EXHIBIT CT- 2 . NUMBER OF ACTIVE VESSELS FISHING IN CONNECTICUT STATE WATERS (2016)

FISHERY	AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lobster	Long Island Sound East	7	4	4	5	11	19	19	19	2	0	2	9
	Long Island Sound Central	3	4	8	11	15	22	25	25	2	0	4	8
	Long Island Sound West	6	4	6	8	8	12	12	10	4	0	5	8
Fish Pot	Long Island Sound East	0	0	0	0	0	2	5	7	6	3	0	2
	Long Island Sound Central	0	0	0	0	3	5	7	5	3	2	0	0
	Long Island Sound West	0	0	0	0	0	0	0	0	0	2	2	0

TABLE CT- 3 . NUMBER OF TRAPS FISHED PER LOBSTER VESSEL IN CONNECTICUT STATE WATERS (2016)

AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Long Island Sound East	272	288	539	285	216	156	159	184	236	236	236	288
Long Island Sound Central	250	121	156	192	148	243	256	149	124.5	124.5	100	201
Long Island Sound West	364	274	354	329	293	302	298	351	111	111	132	153

NEW YORK

The discussion below explains the model's characterization of the activity and gear associated with lobster and gillnet vessels fishing exclusively in New York state waters.[31]

Number of Active Vessels

Lobster

- The New York Department of Environmental Conservation (NY DEC) provided detailed, trip- level logbook data on the activity of lobster vessels permitted in New York State. The reporting shows vessel activity in 34 detailed geographic areas. With help from NY DEC, we consolidated these areas into the four major segments of state waters – Long Island Sound (LIS) West, LIS Central, LIS East, and/or the South of Long Island – with the remaining areas being outside of NY state waters. Exhibit NY-1 shows the location of these areas, including the demarcation of exempt waters.

[31] Information on the activity of other trap/pot vessels licensed to fish exclusively in New York waters is not currently available. NY DEC indicates that while other species (e.g., tautog, black sea bass, scup) are harvested with traps, these species are essentially by-catch harvested by lobster vessels.

- To estimate the number of vessels active in each of the four areas, we collapse the trip-level data into a monthly dataset that can be used to compile the number of active vessels in each area and month. Exhibit NY-2 summarizes the estimated number of active trap/pot vessels in 2017.

Gillnet

- NY DEC provided similar trip-level logbook data for gillnet vessels permitted in New York State. As with trap/pot vessels, we collapse these data to a monthly dataset and compile the number of active gillnet vessels by month and area in 2017 (see Exhibit NY-2).

Gear Configurations For Model Vessels

Lobster

- **Total Traps Fished.** The specification of each model vessel includes the total number of traps that the vessel fishes. We use information from the NY DEC logbook data to estimate the average number of traps fished by vessels in each of the four areas of state waters. The estimate for each area is an average over the year, i.e., the model assumes that all traps are fished year- round, making no seasonal adjustment to the number of traps fished. Exhibit NY-3 summarizes the assumptions.
- **Traps per Trawl.** Each model vessel incorporates an estimate of the number of traps per trawl. Traps per trawl are reported with the logbook data, so averages over the year are calculated for each fishing area (Exhibit NY-3).
- **Endlines per Trawl.** Based on input from NY DEC, we assume two endlines per trawl.
- **Anchor Lines.** We assume that anchor lines are not used.

Gillnet

- For gillnets, the model incorporates an estimate of the number of strings fished per vessel. The NY DEC logbook data include information on this parameter; therefore, the model incorporates an estimate of the average number of strings per vessel in each area of state waters. Exhibit NY- 4 presents the estimates.
- The gillnet model vessels also include a parameter reflecting the number of net panels per string. Exhibit NY-4 includes an estimate for each area, as calculated from the NY DEC logbook data.

EXHIBIT NY- 1 . NEW YORK STATE MODEL VESSEL AREAS

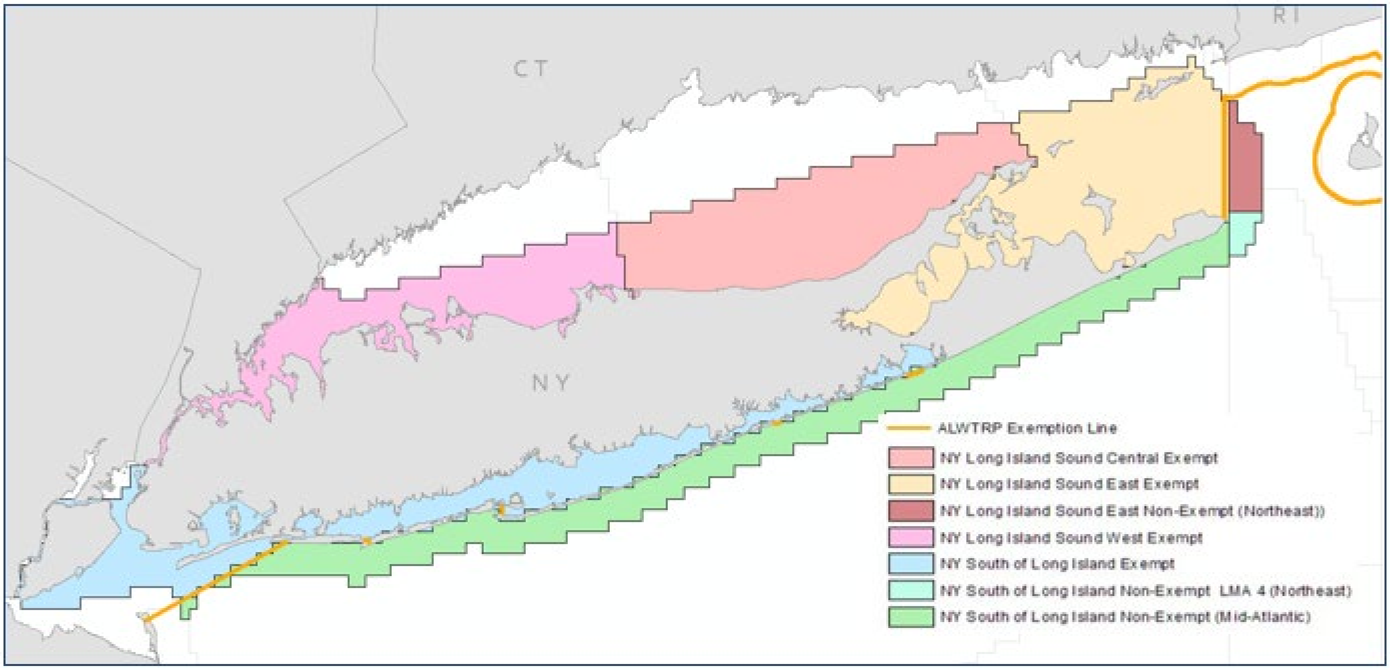


TABLE NY- 2. LOBSTER AND GILLNET VESSELS ACTIVE IN NEW YORK STATE WATERS (2017)

FISHERY	AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Lobster	Long Island Sound East	2	1	3	12	43	46	32	16	21	19	16	5
	Long Island Sound Central	4		1	6	19	22	20	13	16	13	15	10
	South of Long Island Sound	4	2	1	8	15	19	23	20	24	24	19	9
	Long Island Sound West	4	3	3	13	19	19	17	17	17	12	12	6
Gillnet	Long Island Sound East				4	16	14	10	12	12	18	9	2
	Long Island Sound Central						1	1		1	3	3	
	South of Long Island Sound	1			6	12	12	6	8	6	39	46	3
	Long Island Sound West						3	2	2	1	1		

EXHIBIT NY- 3. GEAR ASSUMPTIONS FOR LOBSTER VESSELS IN NEW YORK STATE WATERS (2017)

AREA	AVERAGE POTS FISHED	AVERAGE TRAPS PER TRAWL
Long Island Sound East	108	12
Long Island Sound Central	397	12
Long Island Sound West	615	7
South of Long Island Sound	151	13

EXHIBIT NY- 4. GEAR ASSUMPTIONS FOR GILLNET VESSELS IN NEW YORK STATE WATERS (2017)

AREA	STRINGS PER VESSEL	NETS PER STRING
Long Island Sound East	1.2	2.2
Long Island Sound Central	1.7	1.7
Long Island Sound West	1.5	1.0
South of Long Island Sound	1.4	3.0

NEW JERSEY

The discussion below explains the model's characterization of the activity and gear associated with New Jersey-permitted lobster vessels.[32]

Number of Active Vessels

- Fishery managers with the New Jersey Department of Environmental Protection (NJDEP) indicate that approximately 21 vessels with New Jersey permits actively harvested lobster in 2017.[33] Exhibit NJ-1 reports the number of active vessels by month.
- NJDEP indicates that these vessels fish primarily in Federal waters, with a few vessels operating in both Federal and state waters. Officials indicate that because no vessels fish exclusively in state waters, no data on activity, landings, or gear use by these vessels are collected.[34] The vertical line model characterizes activity in Federal waters using data from NMFS' Vessel Trip Report (VTR) database. Therefore, the NJDEP data on active vessels will be used only for comparative purposes.
- While an active gillnet fishery exists in New Jersey, fishery experts believe that the majority of the activity occurs in Federal waters.[35]

[32] Information on the activity of gillnet or other trap/pot vessels licensed to fish exclusively in New Jersey waters is not currently available.

[33] Updated activity and gear configuration information for lobster vessels obtained through personal communication with Chad Power, NJDEP, February 22, 2019.

[34] Personal communication with Peter Clark, NJDEP, NJ ACCSP State Coordinator, September 30, 2011.

[35] Personal communication with Greg DiDomenico, Garden State Seafood Association, February 12, 2010.

Gear Configurations For Model Vessels

- **Total Traps Fished.** The specification of each model vessel includes the total number of traps that the vessel fishes. Officials with NJDEP estimate that vessels each fish an average of approximately 925 traps. We assume that this average is constant year-round, making no seasonal adjustment to the number of traps that active vessels fish.
- **Traps per Trawl.** Officials with NJDEP suggest that lobster vessels fish approximately 20 traps per trawl, on average. This figure is consistent with a NJDEP report examining fish/lobster potters' use of constructed ocean reef sites.[36] This gear survey reported that the number of traps per trawl used in the study areas ranged from four to 70, with an average of 22 traps per trawl.
- **Endlines per Trawl.** The NJDEP reef study found that 97 percent of all surveyed lobstermen used a high flyer at each end of their trawls; therefore, we assume two endlines per trawl.
- **Anchor Lines.** Consistent with findings for neighboring states, we assume that anchor lines are not used.

EXHIBIT NJ- 1. NUMBER OF ACTIVE NEW JERSEY- PERMITTED LOBSTER VESSELS (2017)

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
5	5	3	4	2	19	18	20	20	18	14	17

EXHIBIT NJ- 2. GEAR CONFIGURATION ASSUMPTIONS FOR NEW JERSEY LOBSTER VESSELS (2017)

AVERAGE TRAPS FISHED PER VESSEL	TRAPS PER TRAWL	ENDLINES PER TRAWL
925	20	2

DELAWARE

The discussion below explains the model's characterization of the activity and gear associated with vessels fishing in Delaware state waters.

Number of Active Vessels

Blue Crab and Other Trap/ Pot

- **Fisheries.** Data provided by the Delaware Division of Fish and Wildlife (DFW) identify several trap/pot fisheries, including the blue crab fishery, the eel pot fishery, the fish pot (black sea bass) fishery, and the conch fishery. While lobster landings occur, they are largely by-catch from the black sea bass fishery.

[36] Carlson, Jeff, et al., Pot Fishing Effort on Eight New Jersey Ocean Reef Sites, October 2005.

- **Number of Active Participants.** DFW compiled logbook data on 2017 activity in each of the trap/pot fisheries. Exhibit DE-1 summarizes the number of active participants in each month. In the case of the blue crab fishery, multiple licenses can be fished from one vessel; therefore, the figures likely overstate the total number of active blue crab vessels, although the degree of overestimation is unknown. For other fisheries, the number of participants is equivalent to the number of active vessels. The data are subdivided by area (Delaware Bay, Inland Bays, Inshore Atlantic Ocean). These areas are labeled in the map presented in Exhibit DE-2. Note that all activity in Delaware Bay occurs on the Delaware side of the shipping channel. The model assumes that the activity reported for each of the three areas is evenly distributed throughout that area.

Gillnet

- **Number of Active Vessels.** DFW provided similar logbook data for gillnet vessels (see Exhibit DE-1). As with trap/pot fisheries, all activity in Delaware Bay occurs on the Delaware side of the shipping channel. Again, the model assumes that the activity reported for each of the areas is evenly distributed throughout that area.

Gear Configurations For Model Vessels

Blue Crab and Other Trap/ Pot

- **Total Traps/Pots Fished.** The specification of each model vessel includes the total number of traps/pots that the vessel typically fishes. DFW provided an analysis of 2017 logbook data estimating the average number of traps/pots fished, by fishery, month, and area. These data showed limited seasonal variation in the number of traps/pots; this is particularly true for the blue crab fishery, which accounts for the majority of fishing activity. Exhibit DE-3 shows the model vessel assumptions for the average number of traps/pots.
- **Traps per Trawl.** Logbook data suggest that most trap/pot vessels in Delaware waters fish singles. The model applies this assumption.
- **Endlines per Trawl.** The model assumes that traps/pots fished as singles have one endline.
- **Anchor Lines.** We assume that anchor lines are not used.

Gillnet

- **Nets per Vessel.** Using state logbook data, DFW provided an analysis of the average net feet fished by gillnet vessels, organized by month and area. Using DFW’s estimate of a net’s typical length (150 feet), we calculate the approximate number of nets fished per vessel, based on 2017 data. This parameter shows limited variation between areas or seasons; therefore, the model employs the mean of the values reported, nine nets per vessel (see Exhibit DE-4).
- **Total Strings Fished.** DFW does not collect data on the typical number of nets

fished per string. The model assumes that gillnets are fished singly, as is the case in Virginia waters, further south along the Delmarva Peninsula.

- **Panel Dimensions.** As noted, DFW staff estimate that net panels are roughly 150 feet long; other information on panel dimensions is unavailable.
- **Other.** The model assumes two surface lines and two 10-foot anchor lines for each gillnet string.

EXHIBIT DE- 1. NUMBER OF ACTIVE PARTICIPANTS IN DELAWARE FISHERIES (2017)

FISHERY	AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Blue Crab	Delaware Bay	2		2	31	38	43	62	70	63	44	10	
Eel Pot	Delaware Bay				1				1	2	3	2	1
	Inland Bays										2	2	
Fish Pot	N/A[1]												
Conch	Atlantic Ocean, Inshore (<3 miles)										1	2	1
	Delaware Bay										2	5	1
Gillnet	Delaware Bay		1	20	29								

Notes:

1. DFW provided data on fish pot activity in ocean waters beyond three miles; however, the model uses Vessel Trip Report (VTR) data to characterize activity in these waters. No fish pot activity was recorded in state waters in 2017.

EXHIBIT DE- 2. AREAS FOR DELAWARE FISHERIES

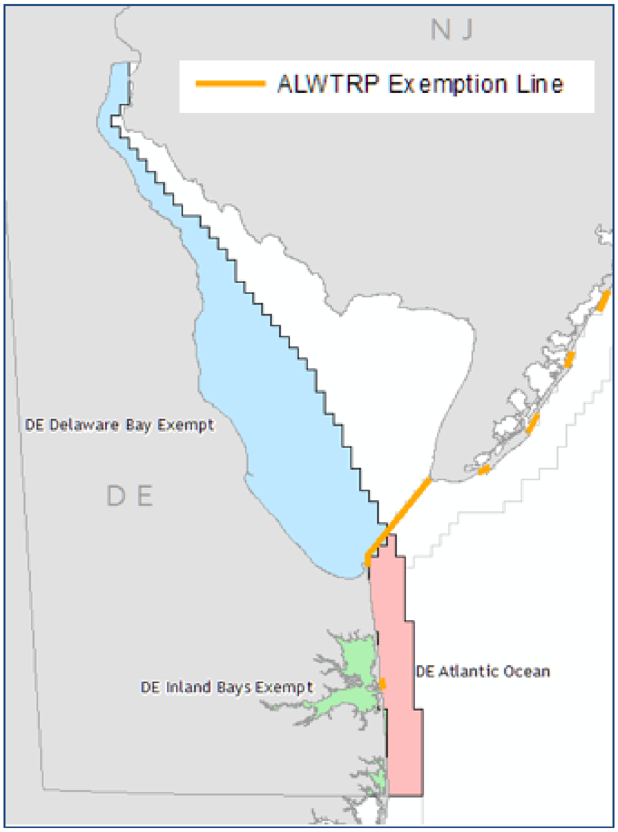


EXHIBIT DE- 4 . GILLNET GEAR CONFIGURATION ASSUMPTIONS FOR DELAWARE STATE WATERS

AVERAGE NUMBER OF STRINGS FISHED	NET PANELS PER STRING	NET PANEL LENGTH (FEET)	NET PANEL HEIGHT (FEET)	ENDLINES PER STRING	ANCHOR LINES
9	1	150	N.A.	2	2 (10 feet each)

MARYLAND

The discussion below explains the model's characterization of the activity and gear associated with vessels fishing in Maryland state waters.

Number of Active Vessels

Blue Crab and Other Trap/ Pot

- **Fisheries.** The Maryland Department of Natural Resources (MDNR) identified several trap/pot fisheries operating in state waters. Significant fisheries include the blue crab fishery, the eel pot fishery, and the fish pot fishery (catfish, black sea bass, tautog, scup). Additional trap/pot fisheries exist, but are not included in the vertical line model. For example, a conch fishery and a trap-based snapping turtle fishery exist, but are small and poorly tracked.
- **Number of Active Vessels.** MDNR used internal resources to develop estimates of the number of active vessels in each fishery, segmenting the estimates by month and fishing area.[37] Exhibit MD-1 provides a map of the fishing areas while Exhibit MD-2 presents the estimated activity. The data are representative of fishing activity in 2017. To develop the estimates, MDNR used a mix of professional judgment and estimates of fishing activity originally developed for purposes of evaluating potential risks to sea turtles.

Gillnet

- **Number of Active Vessels.** MDNR's estimates indicate that anchored gillnet vessels operate in Maryland's Coastal Bays and the state waters portion of the Atlantic.[38] These vessels generally target striped bass, croaker, spot, and spiny dogfish. Exhibit MD-2 summarizes the number of active vessels and the distribution of vessel activity by area.

Gear Configurations For Model Vessels

Blue Crab

- **Total Pots Fished per Blue Crab Vessel.** Based on fishing activity reports, MDNR estimated the number traps that each blue crab vessel fishes in Chesapeake Bay. For the months that the fishery is active (April through December), vessels fish an average of 336 pots. Vessels fishing in Coastal Bays are required to fish fewer traps; MDNR indicates that these vessels fished an average of 164 traps per vessel in 2017. These estimates are summarized in Exhibit MD-3.

[37] The assessment of fishing activity has been updated based on personal communication with Brian Richardson, Director of the Fish Health & Hatcheries Program, February 28, 2019.

[38] Maryland prohibits anchored gillnets in Chesapeake Bay.

- **Traps per Trawl.** MDNR representatives indicate that most blue crab potting occurs south of the Chesapeake Bay Bridge, and that in this area, 75 percent of fishermen fish single pots. The remaining 25 percent of the vessels fish pots connected on long lines. The model assumes that vessels fish 12 pots per long line, using two endlines. All vessels fishing in Coastal Bays are assumed to fish singles.

Other Pot Fisheries

- **Total Pots Fished.** MDNR provided estimates of the number of pots fished per eel pot and fish pot vessel in 2017. As shown in Exhibit MD-3, eel pot vessels fish an average of 267 pots in Chesapeake Bay and 147 pots in the Coastal Bays. Fish pot vessels fish an average of 47 pots.
- **Traps per Trawl.** We assume that fish and conch pots are fished as singles.
- **Endlines per Trawl.** The model assumes that traps/pots fished as singles have one vertical line.
- **Anchor Lines.** We assume that anchor lines are not used.

Gillnet

- **Strings Fished per Vessel.** MDNR representatives indicate that a licensee typically fishes two strings, each with a 900-foot net. Total net length is restricted to 1,800 feet per licensee. Consistent with MDNR recommendations, we assume that two licensees fish from each vessel; hence, the model assigns four strings to each vessel (see Exhibit MD-4).
- **Panel Dimensions.** Based on information from MDNR, nets are assumed to be approximately 900 feet long and 6 to 10 feet high.
- **Other.** The model assumes two surface lines and two 10-foot anchor lines for each gillnet string.

EXHIBIT MD- 1. MARYLAND FISHING AREAS

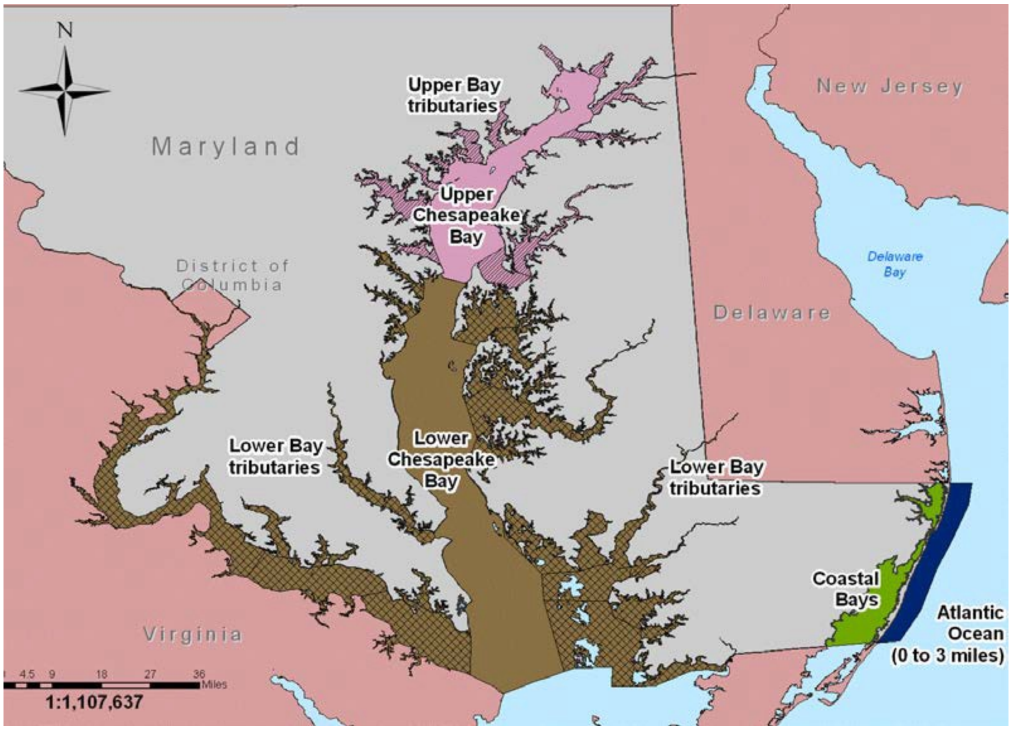


EXHIBIT MD- 2 . NUMBER OF ACTIVE VESSELS IN MARYLAND STATE WATERS (2017)

FISHERY	AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Blue Crab	Chesapeake Bay	0	0	0	154	326	449	503	483	434	362	211	28
	Coastal Bays	0	0	0	49	66	81	82	74	57	36	0	0
Eel Pot	Chesapeake Bay	0	2	7	22	22	15	12	11	18	15	14	2
	Coastal Bays	0	0	1	3	1	1	1	0	0	0	0	0
	Atlantic Ocean (0-3 miles)	0	0	0	1	0	0	0	0	0	0	0	0
Fish Pot	Atlantic Ocean (0-3 miles)	1	0	0	0	0	0	0	0	0	0	1	0
	Chesapeake Bay	11	13	18	25	14	12	8	5	14	9	12	10
Gillnet	Coastal Bays	2	3	16	15	8	3	2	3	2	5	3	2
	Atlantic Ocean (0-3 miles)	7	5	8	13	23	2	2	1	5	3	2	6

EXHIBIT MD- 3 . GEAR CONFIGURATION ASSUMPTIONS FOR TRAP/ POT FISHERIES IN MARYLAND STATE WATERS

FISHERY	AREA	PERCENT OF VESSELS	POTS PER LONG LINE	AVERAGE POTS/TRAPS FISHED PER VESSEL	NUMBER OF ENDLINES
Blue Crab	Chesapeake Bay	75%	Singles	336	1
	Chesapeake Bay	25%	12 pots per long line	336	2
	Coastal Bays	100%	Singles	164	1
Eel Pot	Chesapeake Bay	100%	Singles	267	1
	Coastal Bays	100%	Singles	147	1
Fish Pot	All	100%	10	47	2

EXHIBIT MD- 4 . GILLNET GEAR CONFIGURATION ASSUMPTIONS FOR MARYLAND STATE WATERS

AVERAGE NUMBER OF STRINGS FISHED	NET PANELS PER STRING	NET PANEL LENGTH (FEET)	NET PANEL HEIGHT (FEET)	ENDLINES PER STRING	ANCHOR LINES
4	1	900	6 to 10	2	2 (10 feet each)

VIRGINIA

The discussion below explains the model's characterization of the activity and gear associated with vessels fishing in Virginia state waters.

Number of Active Vessels

Other Trap/ Pot

- **Fisheries.** The Virginia Marine Resources Commission (MRC) compiles commercial fishing data via its harvest reporting system. MRC identifies several trap/pot fisheries operating in state waters. Significant fisheries include the hard crab fishery, the peeler (soft) crab fishery, the conch pot fishery, the eel pot fishery, and the fish pot fishery.[39]
- **Number of Active Vessels.** Using harvest data, MRC identified individual active vessels in each fishery, organizing the data by month and fishing location. The fishing locations consist of nine "systems" and are defined in Exhibit VA-1. The data incorporated into the model reflect activity in 2017; Exhibit VA-2 presents the data on vessel activity for each fishery.

[39] A small minnow pot fishery also exists; this fishery is not included in the model.

Gillnet

- **Number of Active Vessels.** MRC also provided data on activity in 2017 for anchored and staked gillnet vessels. Exhibit VA-2 summarizes these data by month and fishing location.

Gear Configurations For Model Vessels

Hard Crab

- **Total Pots Fished per Hard Crab Vessel**. The specification of each model vessel includes the total number of pots that the vessel typically fishes. MRC analyzed harvest data to estimate the average pots fished per hard crab vessel, by month and area, for 2017. These data showed limited seasonal variation in the number of pots fished; however, the number of pots fished varies according to fishing area. Therefore, the model specifies separate gear configurations for each fishing area (see Exhibit VA-3).
- **Pots per Trawl**. MRC representatives indicate that hard crab vessels typically fish single pots.
- **Endlines per Trawl**. The model assumes that pots fished as singles have one endline.

Other Pot Fisheries

- **Total Pots Fished.** Other pot fisheries show limited seasonal variation in the number of pots fished. Therefore, the model vessels for the peeler, conch, eel, and fish pot fisheries each incorporate a single estimate of pots fished for each relevant fishing area in 2017 (see Exhibit VA-3).
- **Traps per Trawl**. MRC representatives indicate that vessels in these fisheries typically fish single pots.

Gillnet

- **Strings Fished per Vessel**. MRC provided data on the number of strings fished per gillnet vessel, by month and area. This figure varies little by month, but varies significantly by fishing area. Therefore, the model specifies separate gear configurations for each fishing area (see Exhibit VA-4). The model incorporates separate estimates of strings fished for anchored gillnet gear and staked gillnet gear.
- **Nets per String**. MRC experts indicate that gillnet vessels typically fish one net per string.
- **Other**. The model assumes two surface lines and two 10-foot anchor lines for each gillnet string.

EXHIBIT VA- 1 . VIRGINIA FISHING AREAS

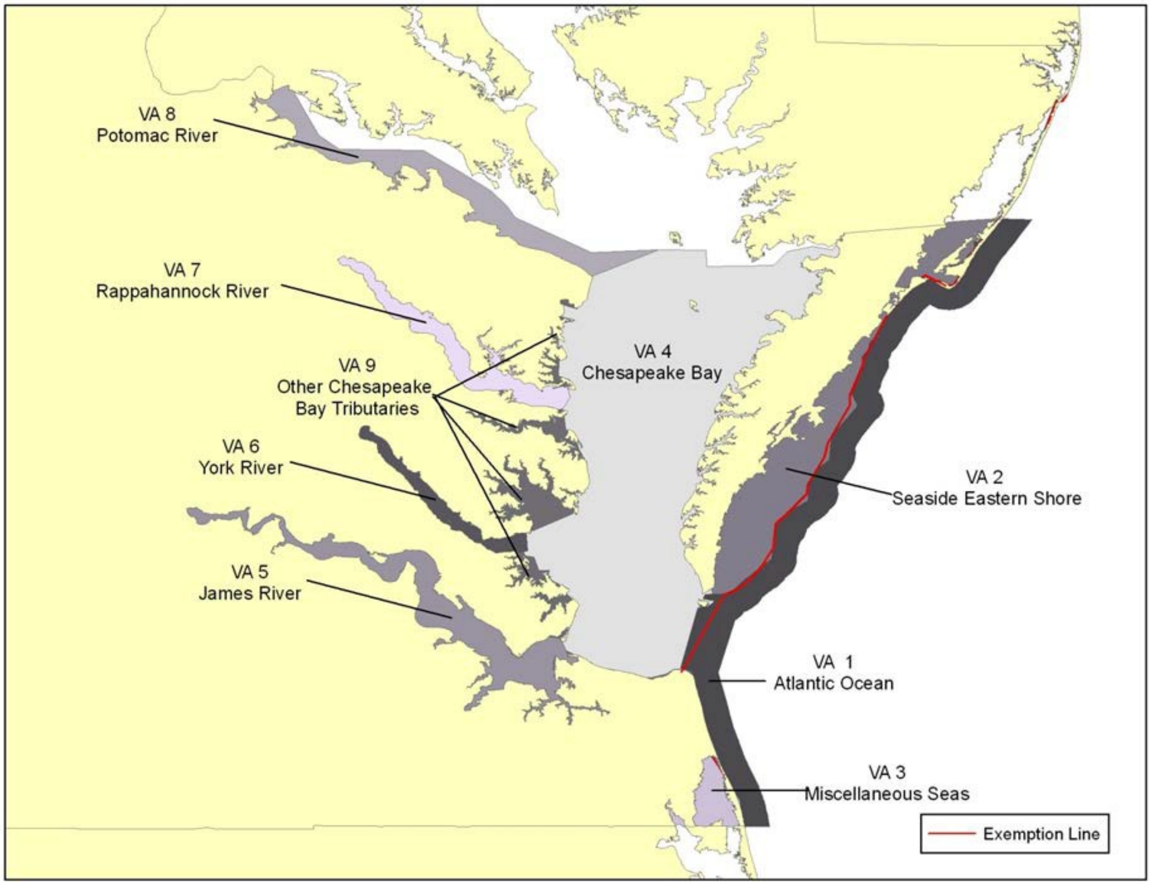


EXHIBIT VA- 2. NUMBER OF ACTIVE VESSELS IN VIRGINIA STATE WATERS (2017)

FISHERY		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
	1			1									
	2			50	46	33	31	31	33	35	32	29	
	3			2	6	8	12	12	13	11	6	4	
Hard Crab (pot)	4			136	209	196	169	169	157	142	124	96	
	5			40	43	54	59	66	62	62	53	41	
	6			14	34	50	52	55	60	53	42	24	
	7			26	69	74	74	82	80	75	50	26	
	8			7	18	55	80	96	105	92	47	9	
	9			27	38	57	68	65	52	52	42	29	
	1					1							
	2				1	17							
	3					1							
	4			1	33	72	56	54	49	37	6		
Peeler (pot)	5				12	17	12	11	11	10	4		
	6				12	20	9	12	10	8	2		
	7				13	36	30	31	33	25	14		
	8				1	4	4	4	4	2			
	9				12	25	13	5	5	6	2	1	
	1	8	6	2	1	1						9	12
	2	1		2	2	1					2	5	3
	3												
	4	2			2	1					1	4	3
Conch Pot	5												
	6												
	7												
	8												
	9												
	1												
	2												
	3												
	4				5	4				3	4	3	
Eel Pot	5				3	2	3	2	3	3	2	2	
	6				1	2	2	2		1	3	3	
	7				6	6	7	4	5	5	5	3	

FISHERY		JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Eel Pot	8					3	3	2	2	2	3	1	
	9				1	2	1	2	2	5	5	2	
Fish Pot	1	1	1		1	1	1	1	1	1	1	1	1
	2			1	1	1	1	1	1	1	1	1	
	3												
	4					2	5	9	13	13	10	1	
	5	4	3	5	4	3	4	3	3	3	3	4	2
	6				3	2	3	3	1	3	1	1	1
	7	4	5	5	8	6	6	6	5	6	8	8	7
	8	1		1	2	1	1	2		2	1	1	1
	9						1	3	1	4	3		
Anchored and Staked Gillnet	1	3	4	6	16	5		2	5	3	5	9	7
	2			3	9	6	2	3	3	3	3	1	
	3												
	4	13	49	66	44	36	26	27	47	78	74	51	43
	5	17	28	24	18	9	3	1	1	6	11	15	19
	6	2	11	26	19	13	12	5	6	13	7	7	5
	7	19	33	27	25	15	11	9	10	14	10	9	15
	8	4	27	32	22	7	6	3	4	4	4	7	14
	9	3	8	14	12	8	10	15	21	29	26	11	3

EXHIBIT VA- 3. GEAR CONFIGURATION ASSUMPTIONS FOR TRAP/ POT FISHERIES IN VIRGINIA STATE WATERS (2017)

FISHERY	AREA/SYSTEM	POTS PER LONG LINE	AVERAGE POTS/TRAPS FISHED PER VESSEL	NUMBER OF ENDLINES
Hard Crab	1	Singles	300	1
	2	Singles	191	1
	3	Singles	214	1
	4	Singles	247	1
	5	Singles	216	1
	6	Singles	229	1
	7	Singles	168	1
	8	Singles	135	1
	9	Singles	190	1
Peeler Crab	1	Singles	100	1
	2	Singles	188	1
	3	Singles	100	1
	4	Singles	223	1
	5	Singles	168	1
	6	Singles	223	1
	7	Singles	184	1
	8	Singles	88	1
	9	Singles	129	1
Conch Pot	1	Singles	285	1
	2	Singles	185	1
	4	Singles	262	1
Eel Pot	4	Singles	78	1
	5	Singles	78	1
	6	Singles	80	1
	7	Singles	72	1
	8	Singles	49	1
	9	Singles	58	1
Fish Pot	1	Singles	33	1
	2	Singles	34	1
	4	Singles	95	1
	5	Singles	16	1
	6	Singles	18	1
	7	Singles	20	1
	8	Singles	13	1
	9	Singles	26	1

EXHIBIT VA- 4. GILLNET GEAR CONFIGURATION ASSUMPTIONS FOR VIRGINIA STATE WATERS

GILLNET TYPE	AREA/SYSTEM	AVERAGE NUMBER OF STRINGS FISHED	NET PANELS PER STRING	ENDLINES PER STRING	ANCHOR LINES PER STRING
Anchored	1	3.02	1	2	2 (10 feet each)
	2	1.59	1	2	2 (10 feet each)
	4	4.78	1	2	2 (10 feet each)
	5	3.11	1	2	2 (10 feet each)
	6	2.31	1	2	2 (10 feet each)
	7	2.8	1	2	2 (10 feet each)
	8	1.72	1	2	2 (10 feet each)
	9	2.14	1	2	2 (10 feet each)
Staked	4	5.74	1	2	2 (10 feet each)
	6	1.68	1	2	2 (10 feet each)
	7	1	1	2	2 (10 feet each)
	8	1.19	1	2	2 (10 feet each)

NORTH CAROLINA

The discussion below explains the model's characterization of the activity and gear associated with vessels fishing in North Carolina state waters.

Number of Active Vessels

Other Trap/ Pot

- **Number of Active Vessels and Trips.** The North Carolina Division of Marine Fisheries (NCDMF) provided compiled trip ticket data on the activity of vessels in the state's black sea bass pot fishery in 2017 and 2018, specifying the number of vessels that were active in each year by month and area. Exhibit NC-1 presents the data for 2017. As shown, the data characterize activity in four areas, including two in state waters (north and south of Cape Hatteras) and two in Federal waters (i.e., more than three miles off the coast, north and south of Cape Hatteras).

- The model directly incorporates the state data on fishing activity for the two areas within three miles of shore (i.e., state waters). In the absence of more precise data, the model assumes that the activity reported within each of these areas is evenly distributed throughout it. Fishing in Federal waters is handled separately in the model through analysis of Southeast logbook data; the data provided by NCDMF will be used to validate the NMFS logbook data.
- Past data analyses provided by NCDMF suggest a minor level of effort targeting blue crab in North Carolina state waters. The model does not explicitly account for this effort, but the degree of error is likely de minimis.

Gillnet

- **Number of Active Vessels.** NCDMF also provided trip ticket data for gillnet vessels. As with pot vessels, the data indicate the number of vessels that were active in each year by month and area of activity, using the same four geographic areas specified above (see Exhibit NC-2). The model directly incorporates the data on fishing activity for the two areas within three miles of shore (i.e., state waters). As above, the model assumes that the activity reported within each of these areas is evenly distributed throughout it. Fishing in Federal waters is characterized separately in the model through analysis of Southeast logbook data; the data provided by NCDMF will be used to validate the NMFS logbook data.

Gear Configurations For Model Vessels

Other Trap/ Pot

Pots Fished per Vessel. Exhibit NC-3 summarizes the gear configuration assumptions for other trap/pot fisheries in North Carolina waters. These assumptions are based in part a 2009 article in *Marine Policy*, which analyzed data suggesting that black sea bass fishermen in northern North Carolina fish an average of 41 pots; the model adopts this estimate.[40] South of Cape Hatteras, the South Atlantic Fishery Management Council (SAFMC) instituted a limit of 35 sea bass pots per vessel, beginning in July 2012. To establish a baseline for analysis of the impacts of future management actions, the model adopts this limit as the default parameter for vessels fishing south of Cape Hatteras. The model employs these assumptions in all months; i.e., it makes no seasonal adjustment to the number of traps fished per vessel.

[40] Levesque, Juan C., "Characterization of the southeastern US black sea bass (*Centropristis striata*) pot commercial fishery and implications for western North Atlantic right whale (*Eubalaena glacialis*) management and policy," *Marine Policy*, 33 (2009) 40-48.

- **Traps per Trawl.** Each model vessel incorporates an estimate of the number of traps per trawl. The 2009 Marine Policy article estimated that vessels in northern North Carolina typically fish five pots per trawl, while those in southern North Carolina fish singles or two pots per trawl. Our model vessels assume five pots per trawl in the north and 1.5 pots per trawl in the south.
- **Endlines per Trawl.** For vessels fishing five-pot trawls (northern NC), the model assumes two endlines. For vessels fishing one to two pots per trawl, the model assumes one endline.

Gillnet

- Exhibit NC-4 summarizes the gillnet gear configuration assumptions applied in the model. These parameters were originally developed in 2011 in consultation with the Fishery Liaison in NMFS' Southeast Regional Office (SERO). The parameters were updated and refined in consultation with NCDMF staff.[41] The parameters are applied to vessels fishing within three miles from shore (see above); vessels fishing in Federal waters are handled separately in the model.
- **Gear Configuration by Segment.** As shown in Exhibit NC-4, the model incorporates assumptions for several different gillnet segments that operate in various seasons:
    - Vessels in the spring Spanish mackerel fishery, prosecuted in May, are assumed to fish 2.5 strings with one panel per string. Nets are each 300 yards in length.
    - Summer Spanish mackerel vessels, active in June through August, also fish 2.5 strings with one panel per string. Nets are each 300 yards in length.
    - Vessels in the large mesh spiny dogfish fishery, active in January through March, fish three strings with five panels per string. Nets are each 100 yards in length.
    - Vessels in the small-mesh fishery, active in June through October, are assumed to fish 3.5 strings per vessel and four panels per string, with each panel 100 yards in length.

  In months where more than one gillnet segment is active, the model averages the relevant configurations and applies the average to the active gillnet vessels. Exhibit NC-5 presents the resulting averages.
- **Buoy Lines.** The model assumes that all gillnet vessels fish strings with two buoy lines.
- **Anchor Lines.** Gillnet vessels do not use anchor lines in North Carolina state waters.

[41] Personal communication with Chris Batsavage, North Carolina Division of Marine Fisheries, December 21, 2017.

EXHIBIT NC- 1. NUMBER OF ACTIVE VESSELS IN NORTH CAROLI NA FISH POT (BLACK SEA BASS) FISHERY (2017)

AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ocean >3 mi, N of Cape Hatteras	1	1										1
Ocean >3 mi, S of Cape Hatteras	6	6	5	9	6	9	6	4	4	3	5	3
Ocean 0-3 mi, N of Cape Hatteras	-	-	-	-	-	-	-	-	-	-	-	-
Ocean 0-3 mi, S of Cape Hatteras	-	-	-	-	-	-	-	-	-	-	-	-

EXHIBIT NC- 2. NUMBER OF ACTIVE VESSELS IN NORTH CAROLI NA GILLNET FISHERY (2017)

AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Ocean >3 mi, N of Cape Hatteras	18	32	27	19	3	2	2	1	-	1	4	17
Ocean >3 mi, S of Cape Hatteras	4	4	3	6	2	1	-	2	2	3	11	6
Ocean 0-3 mi, N of Cape Hatteras	26	32	28	19	8	4	6	5	7	20	17	21
Ocean 0-3 mi, S of Cape Hatteras	33	31	47	61	48	36	35	48	65	87	116	57

EXHIBIT NC- 3 . BLACK SEA BASS GEAR CONFIGURATION ASSUMPTIONS

MODEL VESSEL AREA	POTS FISHED PER VESSEL	POTS PER TRAWL	NUMBER OF ENDLINES
Ocean >3 mi, N of Cape Hatteras	41	5	2
Ocean >3 mi, S of Cape Hatteras	35	1.5	1
Ocean 0-3 mi, N of Cape Hatteras	41	5	2
Ocean 0-3 mi, S of Cape Hatteras	35	1.5	1

EXHIBIT NC- 4. GILLNET GEAR CONFIGURATION ASSUMPTIONS

FISHERY	PRIMARY SEASON	ESTIMATED STRINGS PER VESSEL	ESTIMATED PANELS PER STRING	LENGTH OF EACH NET PANEL (YARDS)	NUMBER OF ANCHOR LINES
Spring Spanish Mackerel	May	2 to 3	1	300	0
Summer Spanish Mackerel	June-Aug	2 to 3	1	300	0
Large Mesh Spiny Dogfish	Jan-Mar	3	5	100	0
Fall/Winter/Spring Small Mesh (primarily sea mullet)	Oct-May	3 to 4	4	100	0

EXHIBIT NC- 5. AVERAGE NUMBER OF STRINGS PER GILLNET VESSEL IN EACH MONTH

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
3.3	3.3	3.3	3.5	3.0	2.5	2.5	2.5	3.0*	3.5	3.5	3.5

* Configuration data not available for September. Figure represents the average of adjacent months.

SOUTH CAROLINA

The discussion below explains the model's characterization of the activity and gear associated with vessels fishing in South Carolina.

Number of Active Vessels

- **Number of Active Blue Crab Vessels.** The South Carolina Department of Natural Resources (SCDNR) provided 2017 data on the number of active vessels in South Carolina's blue crab fishery. The fishery operates almost exclusively inshore, in rivers and estuarine waters landward of the COLREGS line that are exempt from the requirements of the ALWTRP. Exhibit SC-1 shows the number of active blue crab vessels by month and area (exempt and non-exempt waters). The model spreads the inshore activity evenly throughout South Carolina inshore waters.[42]
- **Other Fisheries.** Pot vessels also land black sea bass in South Carolina. SCDNR indicates, however, that all black sea bass pots are fished in Federal waters. The vertical line model characterizes activity in Federal waters using data from NMFS' Southeast Logbook database. Gillnet vessels may target spot in state waters in isolated months, but SCDNR experts indicate that trips and landings are minimal.

Gear Configurations For Model Vessels

- **Pots Fished per Vessel.** SCDNR data indicate that blue crab vessels fish an average of 103 pots per vessel. The data show little seasonal variation, and only limited variation between specific areas.
- **Traps per Trawl.** SCDNR requires that blue crab vessels fish pots as singles (not in trawls).

EXHIBIT SC- 1. NUMBER OF ACTIVE BLUE CRAB VESSELS IN SOUTH CAROLINA STATE WATERS (2017)

WATERS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Inshore (Exempt) Waters	96	87	98	105	97	96	91	90	100	96	94	90
Non-Exempt State Waters	3	6	5	1	1	1	2	2	1	1	3	3

[42] Note that DNR/OFM collects inshore crabbing data at a finer geographic resolution, recording effort in 21 individual inshore areas. Given that inshore waters are exempt from the requirements of the ALWTRP, the model does not segment vessel activity at this level of geographic precision.

GEORGIA

This profile provides an overview of the data and assumptions used to characterize commercial fishing activity in Georgia state waters.

Number of Active Vessels

- **Data Sources.** The Georgia Department of Natural Resources Wildlife Resources Division (DNR/WRD) provided data on fixed-gear fisheries – primarily blue crab operations – operating in Georgia state waters. Originally, DNR/WRD provided data based on information gathered via mail and phone surveys conducted between December 2009 and February 2010.[43] As a follow-up to this survey, DNR/WRD interviewed fisherman at the Georgia Blue Crab Advisory Panel meeting in March 2018. The interviews addressed anticipated effort in 2018 as well as likely gear configurations. DNR/WRD summarized the findings in a letter dated March 18, 2018. The results suggest little change in crabbing activity relative to the original survey; therefore, the effort is broadly reflective of fishing in recent years.
- **Number of Active Vessels.** The interviews DNR/WRD conducted indicate that approximately 25 blue crab vessels operate in ocean waters within three miles of Georgian's shore (i.e., in state waters). The vessels are active in the first quarter of the year, with a subset of vessels initiating fishing in December. Exhibit GA-1 summarizes these estimates. DNR/WRD indicates that no crabbing effort occurs in Federal waters.

Gear Configurations For Model Vessels

- **Pots Fished per Blue Crab Vessel.** DNR/WRD's interviews indicate that each blue crab vessel fishes an average of 55 pots, with no variation across months (see Exhibit GA-1).
- **Traps per Trawl.** Pot trawls are prohibited in Georgia state waters; all pots are fished as singles.
- **Other.** The model assumes one endline per pot with no anchor lines.

EXHIBIT GA- 1. NUMBER OF ACTIVE BLUE CRAB VESSELS IN GEORGIA

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Estimated Number of Active Vessels	25	25	25	-	-	-	-	-	-	-	-	7
Number of Pots Fished per Vessel	55	55	55	-	-	-	-	-	-	-	-	55
Total Number of Pots Fished	1,375	1,375	1,375	-	-	-	-	-	-	-	-	385

[43] George, Clay, "Commercial Trap and Pot Fishing Effort in Georgia Ocean Waters: A Report to the Atlantic Large Whale Take Reduction Team," March 1, 2010

FLORIDA

The discussion below explains the model's characterization of the activity and gear associated with vessels fishing in Florida state waters.

NUMBER OF ACTIVE VESSELS

Trap Fishery

- **Fisheries.** Representatives of Florida's Fish and Wildlife Conservation Commission (FWC) indicate that the trap fishery operating in state waters subject to the ALWTRP is primarily associated with the harvest of blue crab (over 90 percent). Some additional effort focuses on the harvest of stone crab.
- **Number of Active Fishers.** FWC provided detailed trip ticket data on the number of fishers operating in Florida state waters, organizing the data by fishery, month, and area.[44] Five general areas – 722, 728, 732, 736, and 741 – are located in ALWTRP waters; Exhibit FL-1 shows the boundaries of these areas.[45] FWC provided general area data from which we estimate the number of active fishers in each month/area combination.
- **Activity in Inshore and Offshore Areas.** Much of the trap fishery is prosecuted in inshore waters (rivers, estuaries, etc.). These areas are located landward of the COLREGS line and are therefore exempt from the ALWTRP. Detailed area data provided by FWC record the number of trips to subareas within each major area. For example, area 722 is divided into five subareas; two represent offshore waters while the remaining areas (the St. Marys River, Nassau River, and St. Johns River) represent inshore waters. We calculate the percent of trips in offshore and inshore areas for each area/month combination, then apply this percentage to the total number of fishers active in the area/month.[46] Exhibit FL-2 summarizes these calculations.

Other Fisheries

- Florida does not allow anchored gillnets in state waters.

[44] The FWC data characterize activity according to the number of "fishers". The model appropriately equates fishers with vessels, although a given fisher may operate more than one vessel under a given permit.

[45] FWC also provided data for area 717, Georgia state waters. In most months and years, however, no Florida vessels are active in this area.

[46] FWC also provided the number of active vessels (fishers) by subarea and month. However, these data appear to double-count vessels active in more than one subarea, and would likely lead to an overestimate of the total number of active vessels.

GEAR CONFIGURATIONS FOR MODEL VESSELS

- **Total Traps Fished.** The specification of each model vessel includes the total number of traps that the vessel typically fishes. Lacking specific data on the number of traps fished per vessel, FWC provided trip ticket data characterizing the number of traps hauled per licensee, organized by month and area. Translating the number of trap hauls to an estimate of the number of traps fished requires assumptions regarding the frequency with which traps are hauled. FWC suggests that it is reasonable to assume that each trap is hauled 10 times per month (i.e., every three days). Using this assumption, we estimate the average number of traps per licensee by area (see Exhibit FL-3).
- **Traps per Trawl.** FWC indicates that vessels fish traps singly, not in multi-trap trawls.
- **Endlines per Trawl.** The model assumes one endline per trap.

EXHIBIT FL- 1. FLORIDA FISHING AREAS

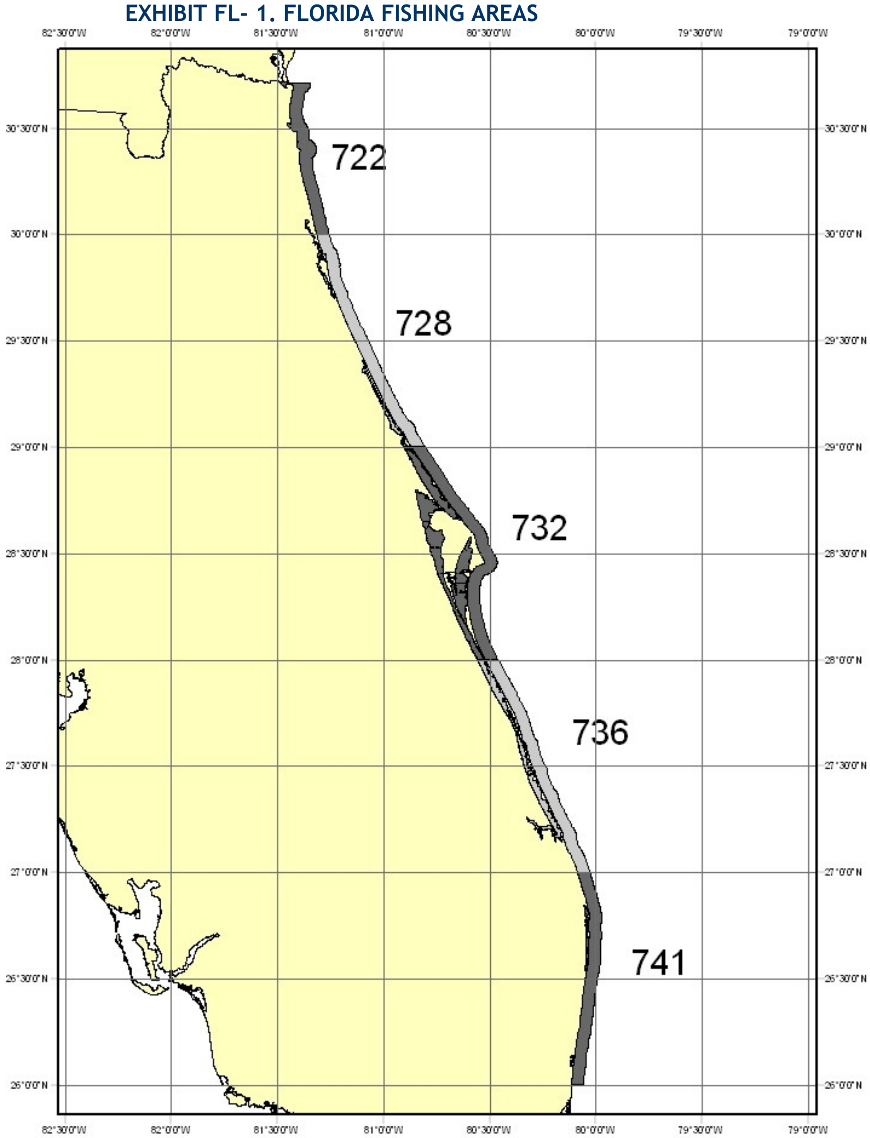


EXHIBIT FL- 2. NUMBER OF ACTIVE TRAP FISHERS IN FLORIDA STATE WATERS (2017)

	AREA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Aggregate Number of Active Fishers	722	37	37	37	43	47	51	45	39	38	41	37	35
	728	41	45	52	63	61	59	55	54	45	36	34	35
	732	27	30	35	41	39	32	29	27	31	37	28	21
	736	5	10	10	6	8	6	5	6	4	6	6	5
	741	4	3	2	3	3	2	2	2	3	6	7	4
Percent of Trips to Offshore Areas	722	0.25%	0.00%	0.22%	0.00%	0.37%	0.40%	0.42%	0.00%	0.00%	0.00%	0.26%	0.00%
	728	4.33%	4.13%	5.02%	2.96%	3.45%	1.97%	1.14%	0.82%	1.61%	1.81%	3.80%	2.60%
	732	0.00%	0.00%	0.62%	0.00%	0.30%	0.00%	0.00%	3.50%	6.53%	0.00%	0.43%	0.54%
	736	3.13%	7.32%	12.50%	2.70%	0.00%	0.00%	7.69%	17.24%	0.00%	0.00%	0.00%	0.00%
	741	16.7%	28.6%	0.0%	0.0%	17.6%	0.0%	28.6%	15.4%	40.0%	10.0%	11.8%	22.2%
Number of Fishers Active in Offshore Waters	722	0	-	0	-	0	0	0	-	-	-	0	-
	728	2	2	3	2	2	1	1	0	1	1	1	1
	732	-	-	0	-	0	-	-	1	2	-	0	0
	736	0	1	1	0	-	-	0	1	-	-	-	-
	741	1	1	-	-	1	-	1	0	1	1	1	1
Number of Fishers Active in Inshore Waters	722	37	37	37	43	47	51	45	39	38	41	37	35
	728	39	43	49	61	59	58	54	54	44	35	33	34
	732	27	30	35	41	39	32	29	26	29	37	28	21
	736	5	9	9	6	8	6	5	5	4	6	6	5
	741	3	2	2	3	2	2	1	2	2	5	6	3

EXHIBIT FL- 3. GEAR CONFIGURATION ASSUMPTIONS FOR TRAP VESSELS FISHING IN FLORIDA STATE WATERS (2017)

MODEL VESSEL AREA	TRAPS FISHED PER LICENSE	TRAPS PER TRAWL	NUMBER OF ENDLINES
722	137	1	1
728	79	1	1
732	100	1	1
736	61	1	1
741	22	1	1

APPENDIX A | NARWC SIGHTINGS PER UNIT EFFORT DATA SOURCES

Survey data sources currently included in the North Atlantic Right Whale Consortium database, 1 December 2019.

Northeast:

AERIAL SURVEYS:

CETAP line-transect surveys, AT-11—1979, 1980, 1981, 1982
CETAP line-transect training flights, AT-11—1978, 1979
CETAP line-transect Great South Channel surveys, AT-11 & Skymaster—1980, 1981
CETAP POP surveys, private single-engine aircraft, USCG Albatross, B-N Islander, USCG helicopter—1978, 1979, 1980, 1981
URI line-transect Great South Channel surveys, Skymaster—1984, 1985, 1987, 1988, 1989, 1991, 1992, 1993
URI POP Great South Channel surveys, Skymaster—1985, 1986, 1987, 1988, 1989, 1992
Provincetown Center for Coastal Studies, Cape Cod Bay surveys, Skymaster—1998–2019 (survey format changed during 2015 season to a new one intermediate between line-transect and POP-type)
Associated Scientists at Woods Hole, Cape Cod Bay, blimp—1990
NEFSC AMAPPS (Atlantic Marine Assessment Program for Protected Species), Twin Otter—2010–2012
NEFSC broad-scale and focused right whale surveys, Twin Otter—1998–2018
NEFSC stock assessment, harbor porpoise, other surveys, Twin Otter (maybe some AT-11 and other aircraft)—1991, 1995, 1998, 2002, 2004
NLPSC (Northeast Large Pelagic Survey Collaborative) line-transect surveys, Mass.-R.I. Wind Energy Areas, Skymaster—2011–2015
New England Aquarium line-transect surveys of Mass.-R.I. Wind Energy Areas (extension of NLPSC program), Skymaster—2017–2018
East Coast Ecosystems, Bay of Fundy/Scotian Shelf, various aircraft—1997
New England Aquarium, Bay of Fundy, Scotian Shelf, Gulf of Maine, various aircraft—1994, 1996, 1997, 2011
Riverhead Foundation, New York/New Jersey, Skymaster—2005

SHIPBOARD POP SURVEYS:

CETAP, various platforms: 1978, 1979, 1980
URI, Great South Channel, various platforms—1986–1989, 1991, 1992
URI, Rhode Island Sound to Kelvin Seamount, USNS Bartlett—1986
URI, Southern New England, Gulf of Maine, Scotian Shelf, Gulf Stream, SSV Westward—1986
Manomet Bird Observatory, NE continental shelf, NOAA ships—1980–1988
Provincetown Center for Coastal Studies, Cape Cod Bay, various—1987–1992, 1997–2003
New England Aquarium (and Canadian Whale Institute), mostly Bay of Fundy (partial), Mass Bay, Gulf of Maine, various—1987–2018

NEFSC, large whale, stock assessment, and harbor porpoise surveys, various—1991, 1992, 1995, 1997, 1998,1999, 2000, 2001, 2002, 2003, 2004, 2005

International Fund for Animal Welfare, Gulf of Maine, Song of the Whale—1997, 1999, 2000
Whale Center of New England, Mass Bay/Jeffreys Ledge—2004

Mid-Atlantic:

AERIAL SURVEYS:

CETAP line-transect surveys, AT-11—1978, 1979, 1980, 1981, 1982
CETAP line-transect training flights, AT-11—1978, 1979
CETAP POP surveys, private single-engine aircraft, USCG Albatross, B-N Islander, USCG helicopter—1978, 1979, 1980, 1981
URI POP Great South Channel surveys, Skymaster (transits)—1986, 1988
NEFSC broad-scale and focused right whale surveys, Twin Otter—1999–2007, 2012–2018
NEFSC stock assessment, bottlenose dolphin, other surveys, Twin Otter, AT-11 and maybe some other aircraft—1991, 1995, 1998, 2002, 2004, 2005
NEFSC & SEFSC AMAPPS (Atlantic Marine Assessment Program for Protected Species), Twin Otter—2010–2013
Riverhead Foundation, New York/New Jersey, Skymaster—2005
University of North Carolina at Wilmington, Wallops Island & Onslow Bay SWTR, Skymaster—1998–1999
University of North Carolina at Wilmington, North Carolina, Skymaster—2001–2002

SHIPBOARD POP SURVEYS:

CETAP, various platforms: 1978, 1979, 1980
URI, Rhode Island Sound to Kelvin Seamount, USNS Bartlett—1986
URI, Southern New England, Gulf of Maine, Scotian Shelf, Gulf Stream, SSV Westward—1986
Manomet Bird Observatory, NE continental shelf, NOAA ships—1980–1988
NEFSC, large whale, stock assessment, and harbor porpoise surveys, various—1995, 1997, 1998, 1999, 2002, 2004, 2005

Southeast:

AERIAL SURVEYS:

CETAP line-transect surveys, AT-11—1979, 1980
URI line-transect surveys, Georgia/Florida, AT-11—1987
New England Aquarium line-transect surveys (MMS project), Skymaster—1989-1992
CETAP POP surveys, private single-engine aircraft, USCG Albatross, B-N Islander, USCG helicopter—1978, 1979, 1980

NEFSC bottlenose dolphin, stock assessment, other surveys, Twin Otter, AT-11 (maybe other aircraft)—1991, 1992, 1995, 2002, 2004, 2005

NEFSC & SEFSC AMAPPS (Atlantic Marine Assessment Program for Protected Species), Twin Otter—2010–2013
U.S. Navy, ship shock trials—1995, 1997, 1999
University of North Carolina at Wilmington, Wallops Island & Onslow Bay SWTR, Skymaster—1998–1999
University of North Carolina at Wilmington, North Carolina, Skymaster—2001–2002
Continental Shelf Associates, offshore surveys (MMS), Skymaster—1996, 1997
Associated Scientists at Woods Hole, SEUS blimp surveys—1991–1993, 2001
Associated Scientists at Woods Hole, Florida nearshore surveys, AirCam—2011, 2012
New England Aquarium, nearshore, misc.—1988–1997
New England Aquarium, South Carolina, misc.—2000
New England Aquarium, EWS, Skymaster—1997–2002
New England Aquarium, central EWS, Skymaster—2002–2010
Florida Wildlife Research Institute, nearshore, misc.—1992–1999
FWRI, offshore, misc.—1996–1998
FWRI, nearshore, Skymaster—1999-2002
FWRI, southern EWS, Skymaster—2002-2019
FWRI, central EWS, Skymaster—2010 (there was a change in the survey design from three areas to only northern (Georgia) and southern (Florida), but I don't recall whether it happened with the 2014-15 or 2015-16 winter season)
Georgia DNR, nearshore, misc.—1993–1998
Georgia DNR, nearshore, Partenavia—1998–2001
Georgia DNR, nearshore, Skymaster—2001–2002
Georgia DNR, offshore, misc.—1996
Georgia DNR, offshore, Skymaster—1998–2001
Georgia DNR, offshore, NOAA Twin Otter—2001–2002
Wildlife Trust, northern EWS (Georgia), NOAA Twin Otter—2002–2011
Wildlife Trust, offshore, Skymaster—2002–2003
Wildlife Trust, offshore, NOAA Twin Otter—2003–2004
Wildlife Trust, South Carolina EWS, Skymaster—2004–2011
Sea to Shore Alliance (name change to Clearwater Marine Aquarium Research Institute after a merger in 2019), northern EWS (Georgia), NOAA Twin Otter—2011–2019
Sea to Shore Alliance, South Carolina EWS, Skymaster—2011–2013 (2014?)

SHIPBOARD POP SURVEYS:

CETAP, various platforms: 1979, 1980
Manomet Bird Observatory, NE continental shelf, NOAA ships—1980–1988
NEFSC, large whale, stock assessment, and bottlenose dolphin surveys, various—1992, 1995, 1997, 1998, 1999, 2002, 2004, 2005

Canada:

AERIAL SURVEYS:

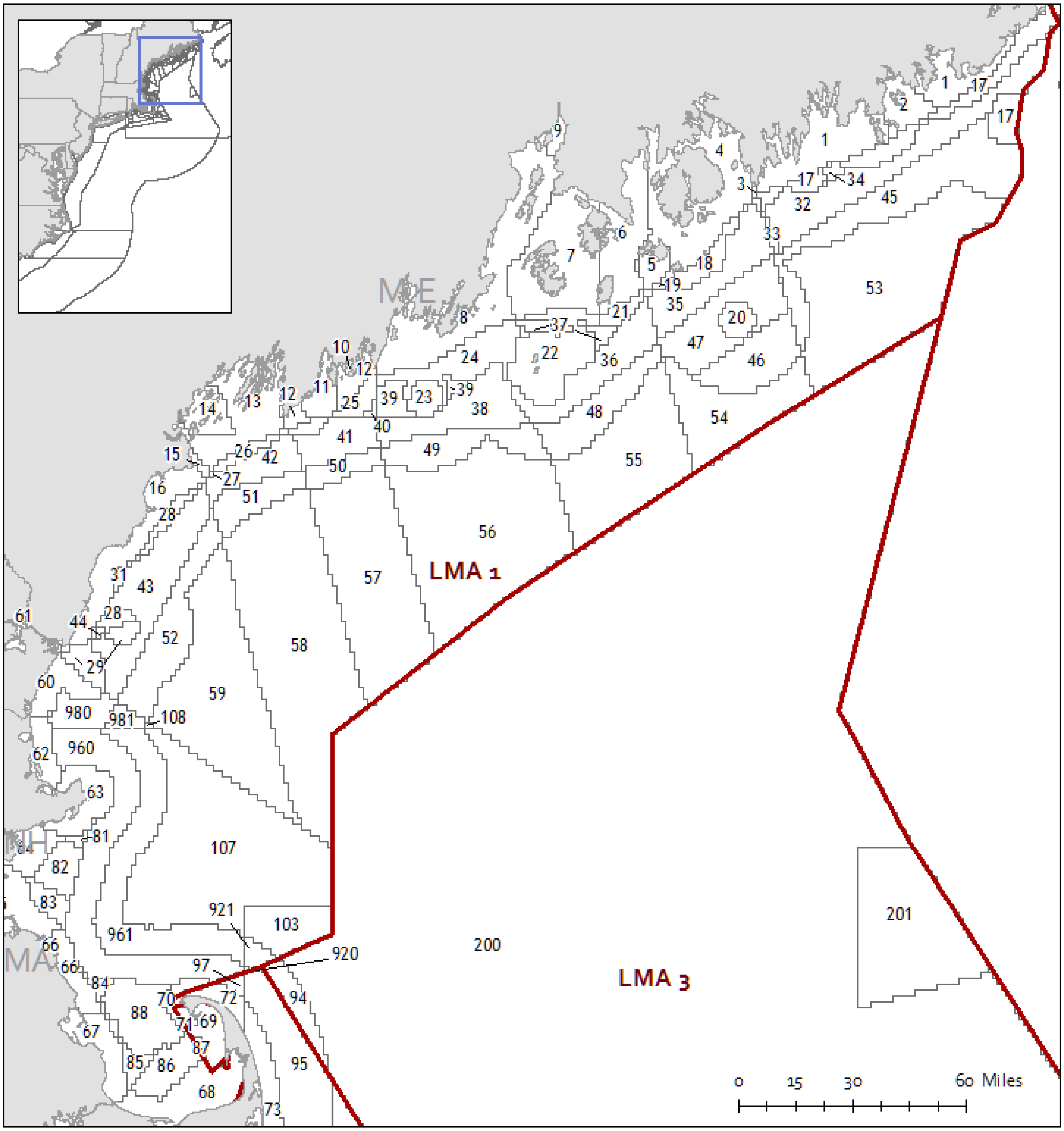
CETAP line-transect surveys, AT-11 & Skymaster—1979, 1980, 1981, 1985, 1987, 1988
CETAP line-transect training flights, AT-11—1979
CETAP POP surveys, Skymaster & miscellaneous aircraft—1979, 1988, 1992
New England Aquarium line-transect surveys using Northeast Large Pelagic Survey Collaborative protocols, Bay of Fundy/Scotian Shelf—2013
Provincetown Center for Coastal Studies, Skymaster—1998, 1999, 2000
NEFSC AMAPPS (Atlantic Marine Assessment Program for Protected Species), Twin Otter—2010–2012
NEFSC broad-scale and focused right whale surveys, Bay of Fundy, Scotian Shelf, Gulf of St. Lawrence (in 2015), Twin Otter—1998–2018
NEFSC stock assessment, harbor porpoise, other surveys, Twin Otter (maybe some other aircraft)—1991, 1995, 1998, 2002, 2004
East Coast Ecosystems, Bay of Fundy/Scotian Shelf, various aircraft—1997–2001
New England Aquarium, Bay of Fundy, Scotian Shelf, various aircraft—1994, 1995, 1996, 1997, 2004, 2011

SHIPBOARD POP SURVEYS:

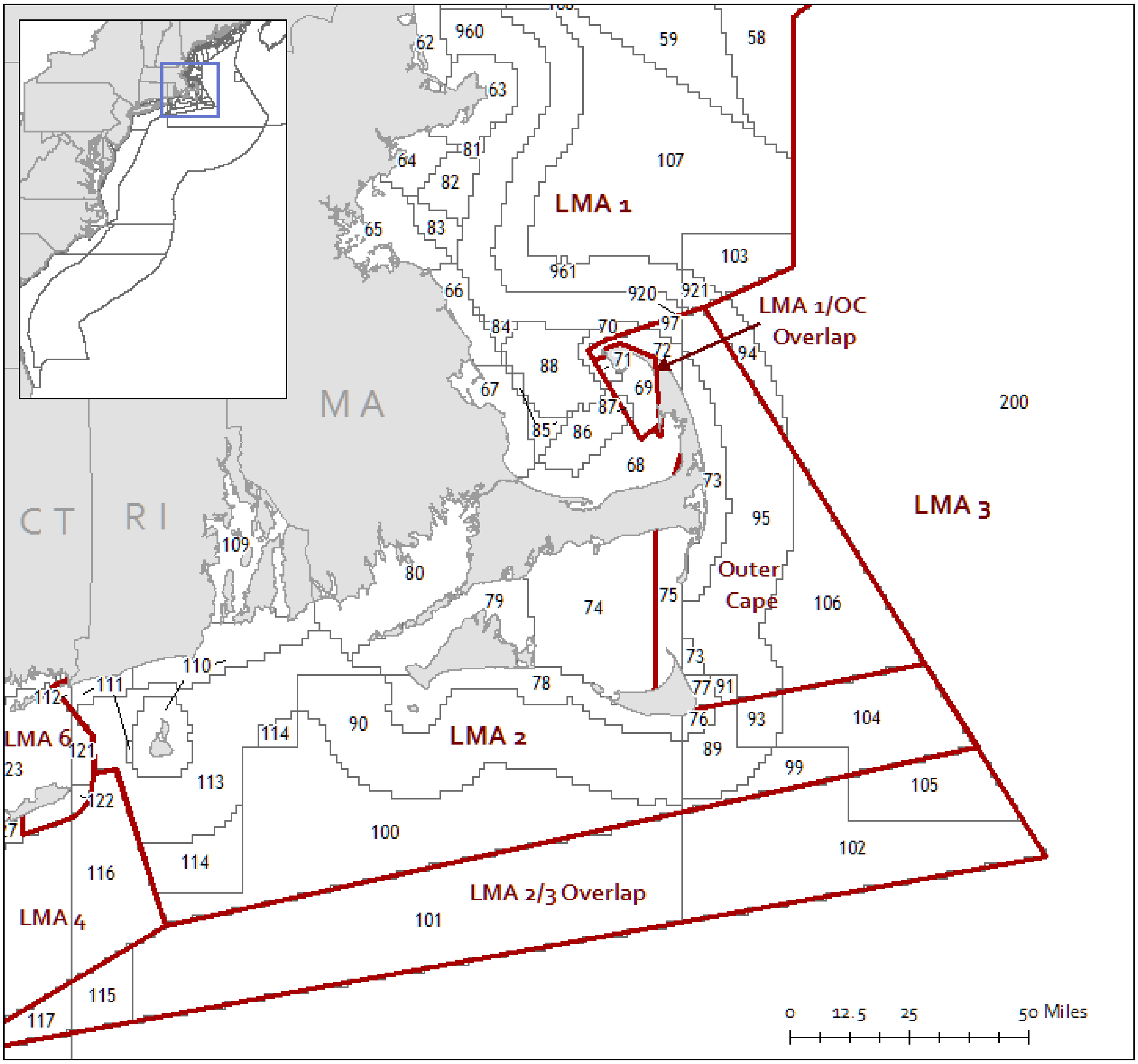
CETAP, various platforms: 1978, 1979, 1980
URI, Rhode Island Sound to Kelvin Seamount, USNS Bartlett—1986
URI, Southern New England, Gulf of Maine, Scotian Shelf, Gulf Stream, SSV Westward—1986
Manomet Bird Observatory, NE continental shelf, NOAA ships—1980–1988
East Coast Ecosystems, Bay of Fundy, various—1994-2002
New England Aquarium (and Canadian Whale Institute), mostly Bay of Fundy, some Scotian Shelf, Gulf of Maine, Gulf of St. Lawrence—1987–2018
NEFSC, large whale, stock assessment, and harbor porpoise surveys, various—1991, 1992, 1995, 1997, 1998, 1999, 2000, 2001, 2002, 2003
International Fund for Animal Welfare, Gulf of Maine, Song of the Whale—1997
Canadian Dept. of Fisheries and Oceans, Bay of Fundy/Scotian Shelf—2006–2008

APPENDIX B | MODEL VESSEL REGIONS

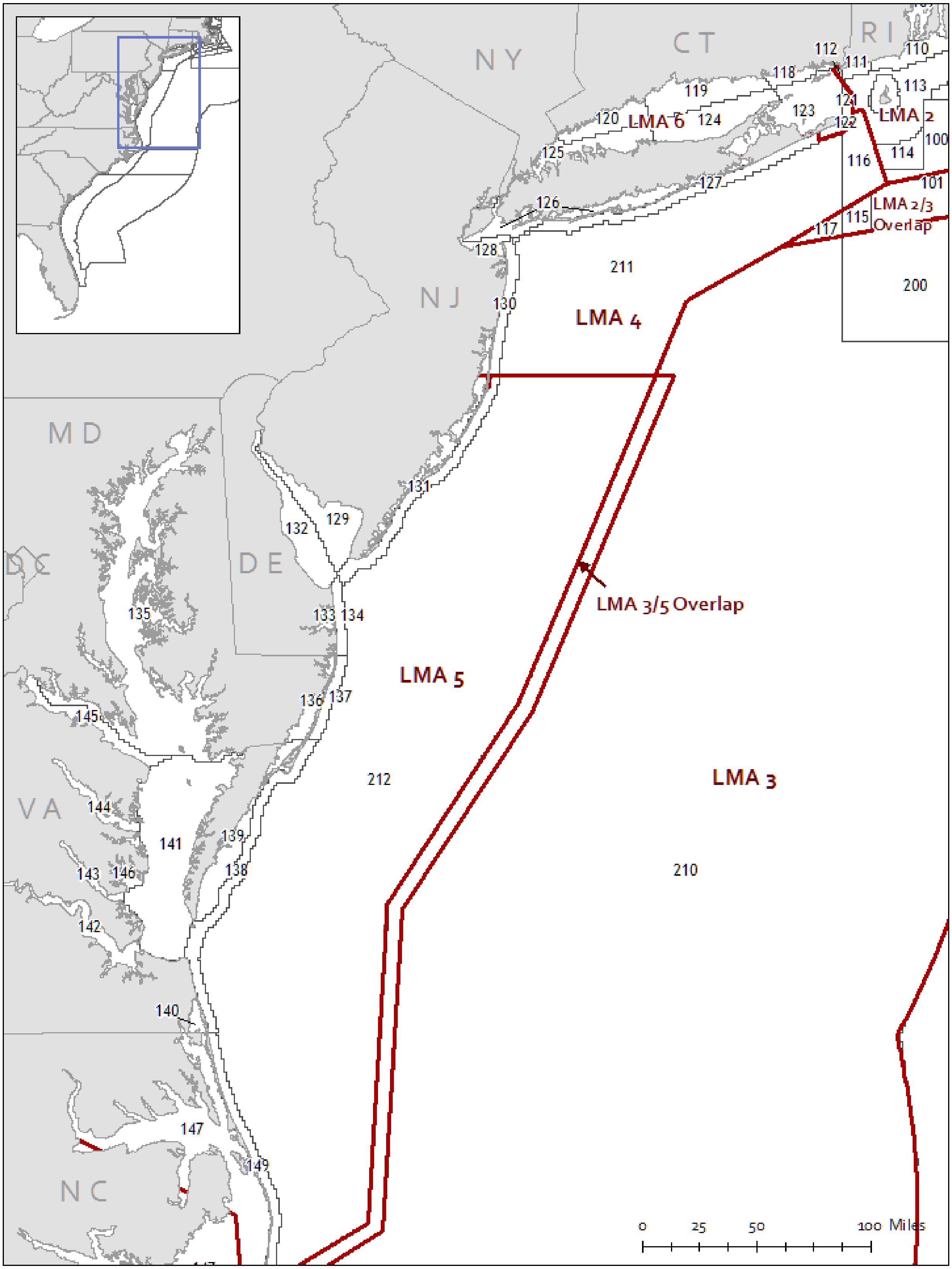
MAINE | NEW HAMPSHIRE | LMA 1 | LMA 3



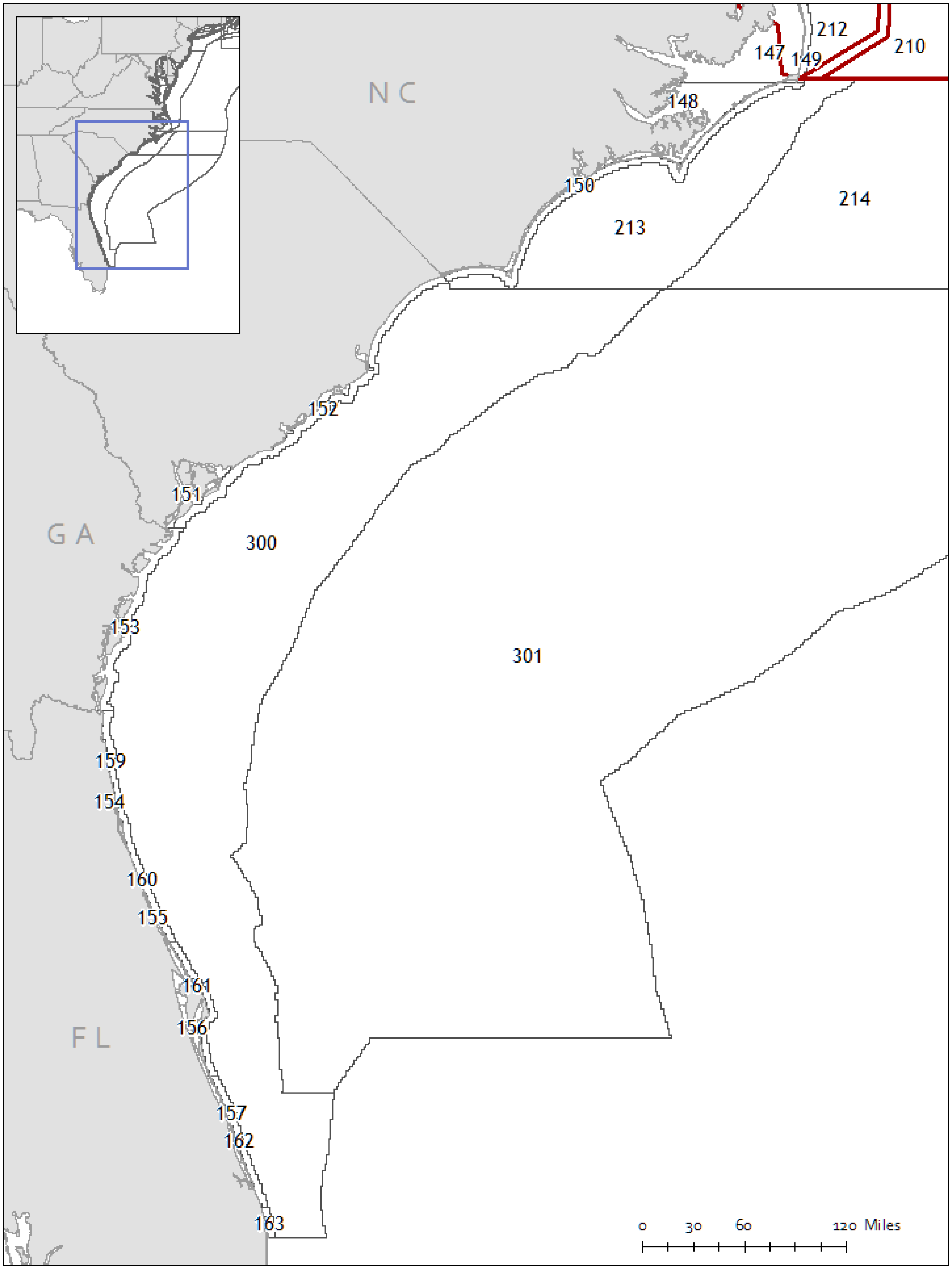
MASSACHUSETTS | RHODE ISLAND | LMA 1 | LMA 2 | OUTER CAPE



MID- ATLANTIC | LMA 4 | LMA 5 | LMA 6



SOUTHEAST


N C
G A
F L
212
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148
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163
0 30 60 120 Miles

REGION ID AND REGION NAME

REGION ID	REGION NAME
1	Maine State Zone A Exempt
2	Maine State Zone A Exempt Washington County Trawl Limits
3	Maine State Zone B Exempt
4	Maine State Zone B Exempt Hancock County Trawl Limits
5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone
6	Maine State Zone C Exempt Hancock County Trawl Limits
7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits
8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits
9	Maine State Zone D Exempt Penobscot Bay Closed Area
10	Maine State Zone E Exempt Linekin Bay Trawl Limits
11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits
12	Maine State Zone E Exempt Zone E Trap Limits
13	Maine State Zone F Exempt
14	Maine State Zone F Exempt Casco Bay Trawl Limits
15	Maine State Zone G Exempt
16	Maine State Zone G Exempt Southern Maine Trawl Limits
17	Maine State Zone A
18	Maine State Zone B Hancock County Trawl Limits
19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone
20	Maine State Zone B Waters Around Mount Desert Rock
21	Maine State Zone C
22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits
23	Maine State Zone D Monhegan Conservation Zone
24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits
25	Maine State Zone E Zone E Trap Limits
26	Maine State Zone F
27	Maine State Zone G
28	Maine State Zone G Southern Maine Trawl Limits
29	Maine State Zone G Waters off Kittery Trawl Limits
30	Maine Nearshore Zone A 3-6 Miles Exempt
31	Maine Nearshore Zone G 3-6 Miles Exempt
32	Maine Nearshore Zone A 3-6 Miles
33	Maine Nearshore Zone A 3-6 Miles (Hancock County Trawl Limits)
34	Maine Nearshore Zone A 3-6 Miles Pocket
35	Maine Nearshore Zone B 3-6 Miles (Hancock County Trawl Limits)
36	Maine Nearshore Zone C 3-6 Miles

REGION ID	REGION NAME
37	Maine Nearshore Zone C 3-6 Miles Pocket
38	Maine Nearshore Zone D 3-6 Miles
39	Maine Nearshore Zone D 3-6 Miles Pocket
40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)
41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)
42	Maine Nearshore Zone F 3-6 Miles
43	Maine Nearshore Zone G 3-6 Miles
44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)
45	Maine Nearshore Zone A 6-12 Miles
46	Maine Nearshore Zone B 6-12 Miles
47	Maine Nearshore Zone B 6-12 Miles (Waters Around Mount Desert Rock)
48	Maine Nearshore Zone C 6-12 Miles
49	Maine Nearshore Zone D 6-12 Miles
50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)
51	Maine Nearshore Zone F 6-12 Miles
52	Maine Nearshore Zone G 6-12 Miles
53	Maine Nearshore Zone A +12 Miles
54	Maine Nearshore Zone B +12 Miles
55	Maine Nearshore Zone C +12 Miles
56	Maine Nearshore Zone D +12 Miles
57	Maine Nearshore Zone E +12 Miles Zone E (Trap Limits)
58	Maine Nearshore Zone F +12 Miles
59	Maine Nearshore Zone G +12 Miles
60	NH Atlantic Exempt
61	NH Inland Bays Exempt
62	Mass State Area 1 Exempt
63	Mass State Area 2 Exempt
64	Mass State Area 3 Exempt
65	Mass State Area 4 Exempt
66	Mass State Area 5 Exempt
67	Mass State Area 6 Exempt
68	Mass State Area 7 - LMA 1 (0 -3) Exempt
69	Mass State Area 7 - LMA 1/OC (0-3) Exempt
70	Mass State Area 8 - LMA 1 (0-3) Exempt
71	Mass State Area 8 - LMA 1/OC (0-3) Exempt
72	Mass State Area 8 - LMA OC (0-3) Exempt
73	Mass State Area 9 Exempt
74	Mass State Area 10 - LMA 2 (0-3) Exempt
75	Mass State Area 10 - LMA OC (0-3) Exempt

REGION ID	REGION NAME
76	Mass State Area 11 - LMA 2 (0-3) Exempt
77	Mass State Area 11 - LMA OC (0-3) Exempt
78	Mass State Area 12 Exempt
79	Mass State Area 13 Exempt
80	Mass State Area 14 Exempt
81	Mass State Area 2
82	Mass State Area 3
83	Mass State Area 4
84	Mass State Area 5
85	Mass State Area 6
86	Mass State Area 7 - LMA 1 (0 -3)
87	Mass State Area 7 - LMA 1/OC (0-3)
88	Mass State Area 8 - LMA 1 (0-3)
89	Mass Nearshore Area 17 - LMA 2 (3-12)
90	Mass Nearshore Area 16 - LMA 2 (3-12)
91	Mass Nearshore Area 17 - LMA OC (3-12)
920	Mass Nearshore Area 18 - LMA 1 (3-6)
921	Mass Nearshore Area 18 - LMA 1 (6-12)
93	Mass Nearshore Area 18 - LMA 2 (3-12)
94	Mass Nearshore Area 18 - LMA 3 (3-12)
95	Mass Nearshore Area 18 - LMA OC (3-12)
960	Mass Nearshore Area 19 - LMA 1 (3-6)
961	Mass Nearshore Area 19 - LMA 1 (6-12)
97	Mass Nearshore Area 19 - LMA OC (3-12)
980	Mass Nearshore Area 20 LMA 1 (3-6)
981	Mass Nearshore Area 20 LMA 1 (6-12)
99	Mass Nearshore Area 17 - LMA 2 (12+)
100	Mass Nearshore Area 16 - LMA 2 (12+)
101	Mass Nearshore Area 16 - LMA 2/3 (12+)
102	Mass Nearshore Area 17 - LMA 2/3 Overlap (12+)
103	Mass Nearshore Area 18 - LMA 1 (12+)
104	Mass Nearshore Area 18 - LMA 2 (12+)
105	Mass Nearshore Area 18 - LMA 2/3 (12+)
106	Mass Nearshore Area 18 - LMA OC (12+)
107	Mass Nearshore Area 19 - LMA 1 (12+)
108	Mass Nearshore Area 20 LMA 1 (12+)
109	RI 538 / 539 Bays Exempt
110	RI 538 / 539 Atlantic Exempt
111	RI 611 Exempt (Northeast)

REGION ID	REGION NAME
112	RI 611 Exempt (Mid-Atlantic)
113	RI 539 Nearshore - LMA 2 (3-12)
114	RI 539 Nearshore - LMA 2 (12+)
115	RI 613 Nearshore LMA 2/3 (12+)
116	RI 613 LMA 4 (12+)
117	RI Area 613 LMA 2/3 Overlap Mid-Atlantic
118	CT Long Island Sound East Exempt
119	CT Long Island Sound Central Exempt
120	CT Long Island Sound West Exempt
121	NY Long Island Sound East Non-Exempt (Northeast))
122	NY South of Long Island Non-Exempt LMA 4 (NE)
123	NY Long Island Sound East Exempt
124	NY Long Island Sound Central Exempt
125	NY Long Island Sound West Exempt
126	NY South of Long Island Exempt
127	NY South of Long Island Non-Exempt (Mid-Atlantic)
128	NJ LMA 4 Exempt
129	NJ LMA 5 Exempt
130	NJ LMA 4 Non-exempt
131	NJ LMA 5 Non-exempt
132	DE Delaware Bay Exempt
133	DE Inland Bays Exempt
134	DE Atlantic Ocean
135	MD Chesapeake Bay Exempt
136	MD Coastal Bays Exempt
137	MD Atlantic Ocean
138	VA Atlantic Ocean System 1
139	VA Seaside Eastern Shore System 2
140	VA Miscellaneous Seaside Codes System 3
141	VA Chesapeake Bay System 4
142	VA James River System 5
143	VA York River System 6
144	VA Rappahannock River System 7
145	VA Potomac River System 8
146	VA Other Chesapeake Bay Tribs System 9
147	NC North of Cape Hatteras Exempt
148	NC South of Cape Hatteras Exempt
149	NC North of Cape Hatteras Non-Exempt
150	NC South of Cape Hatteras Non-Exempt

REGION ID	REGION NAME
151	SC Exempt
152	SC Non-Exempt
153	GA Non-Exempt
154	FL Jacksonville (722) Exempt
155	FL St. Augustine (728) Exempt
156	FL Cape Canaveral (732) Exempt
157	FL Fort Pierce (736) Exempt
158	FL West Palm Beach (741) Exempt
159	FL Jacksonville (722) Non-Exempt
160	FL St. Augustine (728) Non-Exempt
161	FL Cape Canaveral (732) Non-Exempt
162	FL Fort Pierce (736) Non-Exempt
163	FL West Palm Beach (741) Non-Exempt
200	Other LMA 3 (12+) Offshore
201	Other LMA 3 (12+) Offshore Georges Basin
210	LMA 3 Mid-Atlantic Offshore
211	LMA 4 Mid-Atlantic Nearshore
212	LMA 5 Mid-Atlantic Nearshore
213	Outside LMA 5 Mid-Atlantic Nearshore
214	Outside LMA 3 Mid-Atlantic Offshore
300	South Atlantic Nearshore
301	South Atlantic Offshore

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	1	Maine State Zone A Exempt	1	1 to 100	0.00%	0.00%	0.00%	8.10%	7.40%	11.90%	23.80%	23.40%	20.90%	16.40%	14.20%	2.20%
ME	1	Maine State Zone A Exempt	1	101 to 300	12.50%	0.00%	0.00%	8.10%	11.10%	13.30%	15.20%	14.50%	15.00%	12.70%	14.90%	4.30%
ME	1	Maine State Zone A Exempt	1	301 to 500	0.00%	0.00%	0.00%	5.40%	6.20%	8.90%	5.40%	5.50%	6.40%	9.00%	4.50%	4.30%
ME	1	Maine State Zone A Exempt	1	501 to 700	0.00%	25.00%	10.00%	2.70%	3.70%	4.40%	5.40%	6.00%	5.00%	3.70%	0.70%	2.20%
ME	1	Maine State Zone A Exempt	1	701+	0.00%	0.00%	0.00%	2.70%	3.70%	5.90%	6.30%	8.90%	9.10%	9.00%	4.50%	0.00%
ME	1	Maine State Zone A Exempt	2	1 to 100	0.00%	0.00%	20.00%	2.70%	4.90%	0.70%	1.30%	0.40%	0.50%	0.50%	0.70%	6.50%
ME	1	Maine State Zone A Exempt	2	101 to 300	37.50%	25.00%	10.00%	18.90%	9.90%	8.10%	3.60%	3.80%	4.10%	3.70%	6.00%	13.00%
ME	1	Maine State Zone A Exempt	2	301 to 500	0.00%	0.00%	0.00%	8.10%	16.00%	6.70%	3.10%	3.40%	4.10%	5.80%	10.40%	8.70%
ME	1	Maine State Zone A Exempt	2	501 to 700	0.00%	0.00%	0.00%	8.10%	2.50%	5.20%	8.50%	4.70%	4.10%	4.80%	6.70%	4.30%
ME	1	Maine State Zone A Exempt	2	701+	0.00%	0.00%	0.00%	0.00%	3.70%	3.70%	5.40%	8.90%	8.20%	8.50%	3.70%	2.20%
ME	1	Maine State Zone A Exempt	3 to 4	1 to 100	0.00%	0.00%	0.00%	2.70%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%
ME	1	Maine State Zone A Exempt	3 to 4	101 to 300	0.00%	25.00%	10.00%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%	2.20%	4.30%
ME	1	Maine State Zone A Exempt	3 to 4	301 to 500	0.00%	0.00%	10.00%	0.00%	3.70%	1.50%	1.80%	1.30%	0.50%	1.10%	0.70%	2.20%
ME	1	Maine State Zone A Exempt	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.90%	0.90%	1.40%	1.60%	0.70%	0.00%
ME	1	Maine State Zone A Exempt	3 to 4	701+	0.00%	0.00%	0.00%	2.70%	1.20%	2.20%	1.30%	2.60%	3.20%	1.60%	0.70%	0.00%
ME	1	Maine State Zone A Exempt	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%
ME	1	Maine State Zone A Exempt	5 to 9	101 to 300	0.00%	0.00%	0.00%	0.00%	2.50%	1.50%	0.40%	0.00%	0.00%	0.00%	3.70%	0.00%
ME	1	Maine State Zone A Exempt	5 to 9	301 to 500	0.00%	25.00%	10.00%	2.70%	0.00%	2.20%	0.40%	0.90%	0.90%	2.60%	3.00%	4.30%
ME	1	Maine State Zone A Exempt	5 to 9	501 to 700	12.50%	0.00%	0.00%	2.70%	1.20%	0.70%	0.00%	0.00%	0.50%	0.50%	1.50%	2.20%
ME	1	Maine State Zone A Exempt	5 to 9	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	1.30%	1.40%	1.60%	1.50%	0.00%
ME	1	Maine State Zone A Exempt	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	1.20%	0.00%	1.30%	0.90%	0.00%	0.00%	0.70%	4.30%
ME	1	Maine State Zone A Exempt	10 to 14	101 to 300	12.50%	0.00%	10.00%	0.00%	1.20%	3.70%	1.30%	0.40%	0.90%	1.60%	1.50%	2.20%
ME	1	Maine State Zone A Exempt	10 to 14	301 to 500	0.00%	0.00%	0.00%	2.70%	0.00%	0.70%	0.90%	1.30%	0.90%	0.50%	2.20%	2.20%
ME	1	Maine State Zone A Exempt	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	1.20%	2.20%	2.70%	1.30%	0.90%	1.10%	1.50%	0.00%
ME	1	Maine State Zone A Exempt	10 to 14	701+	0.00%	0.00%	10.00%	0.00%	1.20%	0.00%	0.40%	1.30%	2.30%	1.60%	2.20%	4.30%
ME	1	Maine State Zone A Exempt	15 to 19	101 to 300	12.50%	0.00%	10.00%	8.10%	4.90%	3.00%	1.30%	0.90%	1.40%	1.10%	0.70%	0.00%
ME	1	Maine State Zone A Exempt	15 to 19	301 to 500	12.50%	0.00%	0.00%	2.70%	1.20%	0.70%	0.00%	0.40%	0.90%	0.00%	0.70%	0.00%
ME	1	Maine State Zone A Exempt	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	2.50%	1.50%	0.40%	0.40%	0.50%	0.50%	0.70%	6.50%
ME	1	Maine State Zone A Exempt	15 to 19	701+	0.00%	0.00%	0.00%	2.70%	1.20%	0.70%	2.20%	2.60%	3.60%	5.30%	4.50%	4.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	1	Maine State Zone A Exempt	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.50%	0.70%	0.00%
ME	1	Maine State Zone A Exempt	20 to 39	101 to 300	0.00%	0.00%	0.00%	5.40%	0.00%	0.70%	0.90%	0.40%	0.00%	0.50%	0.00%	0.00%
ME	1	Maine State Zone A Exempt	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	4.90%	1.50%	0.90%	1.70%	0.90%	1.10%	0.70%	6.50%
ME	1	Maine State Zone A Exempt	20 to 39	501 to 700	0.00%	0.00%	0.00%	2.70%	1.20%	2.20%	2.20%	0.90%	1.40%	1.10%	0.70%	4.30%
ME	1	Maine State Zone A Exempt	20 to 39	701+	0.00%	0.00%	0.00%	0.00%	1.20%	0.70%	0.90%	1.30%	1.40%	2.10%	1.50%	2.20%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	1	1 to 100	0.00%	0.00%	0.00%	8.10%	7.40%	11.90%	23.80%	23.40%	20.90%	16.40%	14.20%	2.20%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	1	101 to 300	12.50%	0.00%	0.00%	8.10%	11.10%	13.30%	15.20%	14.50%	15.00%	12.70%	14.90%	4.30%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	1	301 to 500	0.00%	0.00%	0.00%	5.40%	6.20%	8.90%	5.40%	5.50%	6.40%	9.00%	4.50%	4.30%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	1	501 to 700	0.00%	25.00%	10.00%	2.70%	3.70%	4.40%	5.40%	6.00%	5.00%	3.70%	0.70%	2.20%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	1	701+	0.00%	0.00%	0.00%	2.70%	3.70%	5.90%	6.30%	8.90%	9.10%	9.00%	4.50%	0.00%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	2	1 to 100	0.00%	0.00%	20.00%	2.70%	4.90%	0.70%	1.30%	0.40%	0.50%	0.50%	0.70%	6.50%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	2	101 to 300	37.50%	25.00%	10.00%	18.90%	9.90%	8.10%	3.60%	3.80%	4.10%	3.70%	6.00%	13.00%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	2	301 to 500	0.00%	0.00%	0.00%	8.10%	16.00%	6.70%	3.10%	3.40%	4.10%	5.80%	10.40%	8.70%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	2	501 to 700	0.00%	0.00%	0.00%	8.10%	2.50%	5.20%	8.50%	4.70%	4.10%	4.80%	6.70%	4.30%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	2	701+	0.00%	0.00%	0.00%	0.00%	3.70%	3.70%	5.40%	8.90%	8.20%	8.50%	3.70%	2.20%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4	1 to 100	0.00%	0.00%	0.00%	2.70%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4	101 to 300	0.00%	25.00%	10.00%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%	2.20%	4.30%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4	301 to 500	0.00%	0.00%	10.00%	0.00%	3.70%	1.50%	1.80%	1.30%	0.50%	1.10%	0.70%	2.20%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.90%	0.90%	1.40%	1.60%	0.70%	0.00%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4	701+	0.00%	0.00%	0.00%	2.70%	1.20%	2.20%	1.30%	2.60%	3.20%	1.60%	0.70%	0.00%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4 adjusted for max tpt - 4	1 to 100	0.00%	0.00%	0.00%	0.00%	1.20%	1.50%	1.30%	0.90%	0.00%	0.50%	2.20%	4.30%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4 adjusted for max tpt - 4	101 to 300	25.00%	0.00%	20.00%	13.50%	8.60%	8.90%	4.00%	1.70%	2.30%	3.20%	6.00%	2.20%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4 adjusted for max tpt - 4	301 to 500	12.50%	25.00%	10.00%	8.10%	6.20%	5.20%	2.20%	4.30%	3.60%	4.20%	6.70%	13.00%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4 adjusted for max tpt - 4	501 to 700	12.50%	0.00%	0.00%	5.40%	6.20%	6.70%	5.40%	2.60%	3.20%	3.20%	4.50%	13.00%
ME	2	Maine State Zone A Exempt Washington County Trawl Limits	3 to 4 adjusted for max tpt - 4	701+	0.00%	0.00%	10.00%	2.70%	3.70%	1.50%	4.90%	6.40%	8.60%	10.60%	9.70%	10.90%
ME	3	Maine State Zone B Exempt	1	1 to 100	0.00%	0.00%	0.00%	0.00%	4.80%	24.30%	35.40%	33.90%	31.30%	20.50%	5.70%	15.50%
ME	3	Maine State Zone B Exempt	1	101 to 300	0.00%	0.00%	0.00%	10.80%	12.70%	10.80%	10.50%	10.60%	11.40%	11.40%	9.20%	6.90%
ME	3	Maine State Zone B Exempt	1	301 to 500	11.10%	7.10%	4.00%	5.40%	6.30%	9.00%	8.30%	3.70%	3.60%	3.00%	9.20%	0.00%
ME	3	Maine State Zone B Exempt	1	501 to 700	0.00%	0.00%	0.00%	0.00%	1.60%	1.80%	5.50%	3.70%	3.60%	7.60%	4.60%	3.40%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	3	Maine State Zone B Exempt	1	701+	0.00%	0.00%	0.00%	2.70%	6.30%	4.50%	4.40%	5.80%	4.80%	4.50%	1.10%	0.00%
ME	3	Maine State Zone B Exempt	2	1 to 100	0.00%	0.00%	4.00%	5.40%	0.00%	0.90%	1.10%	1.60%	1.80%	2.30%	3.40%	8.60%
ME	3	Maine State Zone B Exempt	2	101 to 300	11.10%	14.30%	16.00%	27.00%	19.00%	9.00%	2.20%	2.60%	3.60%	5.30%	9.20%	12.10%
ME	3	Maine State Zone B Exempt	2	301 to 500	0.00%	0.00%	12.00%	8.10%	9.50%	10.80%	5.50%	6.30%	4.20%	7.60%	9.20%	10.30%
ME	3	Maine State Zone B Exempt	2	501 to 700	16.70%	14.30%	12.00%	2.70%	6.30%	3.60%	5.00%	4.80%	5.40%	9.10%	12.60%	8.60%
ME	3	Maine State Zone B Exempt	2	701+	11.10%	7.10%	4.00%	5.40%	1.60%	4.50%	6.60%	11.10%	12.70%	7.60%	5.70%	3.40%
ME	3	Maine State Zone B Exempt	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%
ME	3	Maine State Zone B Exempt	3 to 4	101 to 300	0.00%	0.00%	8.00%	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%	2.30%	0.00%	0.00%
ME	3	Maine State Zone B Exempt	3 to 4	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%	1.10%	1.70%
ME	3	Maine State Zone B Exempt	3 to 4	501 to 700	11.10%	14.30%	8.00%	5.40%	1.60%	0.00%	0.60%	0.00%	0.00%	0.00%	2.30%	1.70%
ME	3	Maine State Zone B Exempt	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	1.60%	0.90%	0.60%	0.50%	0.00%	2.30%	2.30%	3.40%
ME	3	Maine State Zone B Exempt	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	1.60%	0.00%	0.00%	0.50%	0.60%	0.00%	1.10%	0.00%
ME	3	Maine State Zone B Exempt	5 to 9	101 to 300	5.60%	7.10%	0.00%	2.70%	3.20%	0.90%	0.60%	0.50%	1.20%	0.80%	0.00%	0.00%
ME	3	Maine State Zone B Exempt	5 to 9	301 to 500	0.00%	0.00%	0.00%	2.70%	1.60%	0.90%	1.10%	1.60%	2.40%	0.80%	3.40%	1.70%
ME	3	Maine State Zone B Exempt	5 to 9	501 to 700	0.00%	0.00%	0.00%	2.70%	1.60%	1.80%	0.60%	0.50%	0.00%	0.00%	0.00%	1.70%
ME	3	Maine State Zone B Exempt	5 to 9	701+	5.60%	0.00%	4.00%	2.70%	1.60%	0.90%	0.60%	0.00%	0.60%	0.00%	1.10%	1.70%
ME	3	Maine State Zone B Exempt	10 to 14	1 to 100	0.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	3	Maine State Zone B Exempt	10 to 14	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	0.60%	0.00%	0.60%	0.80%	1.10%	0.00%
ME	3	Maine State Zone B Exempt	10 to 14	301 to 500	5.60%	7.10%	8.00%	0.00%	1.60%	0.90%	0.00%	0.50%	0.00%	1.50%	1.10%	1.70%
ME	3	Maine State Zone B Exempt	10 to 14	501 to 700	5.60%	7.10%	8.00%	8.10%	3.20%	1.80%	2.20%	1.60%	1.80%	0.80%	1.10%	3.40%
ME	3	Maine State Zone B Exempt	10 to 14	701+	5.60%	7.10%	0.00%	0.00%	0.00%	1.80%	2.20%	2.60%	1.80%	3.80%	3.40%	1.70%
ME	3	Maine State Zone B Exempt	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	3	Maine State Zone B Exempt	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%	0.00%	3.40%	0.00%
ME	3	Maine State Zone B Exempt	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%	0.00%	0.00%	2.30%	0.00%
ME	3	Maine State Zone B Exempt	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	1.10%	2.40%	3.00%	1.10%	0.00%
ME	3	Maine State Zone B Exempt	15 to 19	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.50%	1.20%	1.50%	0.00%	0.00%
ME	3	Maine State Zone B Exempt	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	0.60%	0.50%	0.60%	0.80%	0.00%	6.90%
ME	3	Maine State Zone B Exempt	20 to 39	101 to 300	5.60%	7.10%	4.00%	2.70%	4.80%	1.80%	0.60%	0.50%	0.60%	0.00%	2.30%	1.70%
ME	3	Maine State Zone B Exempt	20 to 39	301 to 500	0.00%	0.00%	0.00%	2.70%	3.20%	1.80%	1.10%	1.60%	0.60%	1.50%	1.10%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	3	Maine State Zone B Exempt	20 to 39	501 to 700	5.60%	7.10%	4.00%	2.70%	3.20%	0.90%	1.10%	1.60%	1.20%	0.00%	0.00%	0.00%
ME	3	Maine State Zone B Exempt	20 to 39	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.10%	1.60%	1.80%	1.50%	1.10%	0.00%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	1	1 to 100	0.00%	0.00%	0.00%	0.00%	4.80%	24.30%	35.40%	33.90%	31.30%	20.50%	5.70%	15.50%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	1	101 to 300	0.00%	0.00%	0.00%	10.80%	12.70%	10.80%	10.50%	10.60%	11.40%	11.40%	9.20%	6.90%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	1	301 to 500	11.10%	7.10%	4.00%	5.40%	6.30%	9.00%	8.30%	3.70%	3.60%	3.00%	9.20%	0.00%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	1	501 to 700	0.00%	0.00%	0.00%	0.00%	1.60%	1.80%	5.50%	3.70%	3.60%	7.60%	4.60%	3.40%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	1	701+	0.00%	0.00%	0.00%	2.70%	6.30%	4.50%	4.40%	5.80%	4.80%	4.50%	1.10%	0.00%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	2	1 to 100	0.00%	0.00%	4.00%	5.40%	0.00%	0.90%	1.10%	1.60%	1.80%	2.30%	3.40%	8.60%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	2	101 to 300	11.10%	14.30%	16.00%	27.00%	19.00%	9.00%	2.20%	2.60%	3.60%	5.30%	9.20%	12.10%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	2	301 to 500	0.00%	0.00%	12.00%	8.10%	9.50%	10.80%	5.50%	6.30%	4.20%	7.60%	9.20%	10.30%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	2	501 to 700	16.70%	14.30%	12.00%	2.70%	6.30%	3.60%	5.00%	4.80%	5.40%	9.10%	12.60%	8.60%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	2	701+	11.10%	7.10%	4.00%	5.40%	1.60%	4.50%	6.60%	11.10%	12.70%	7.60%	5.70%	3.40%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	4.00%	0.00%	3.20%	0.90%	1.10%	1.10%	1.20%	0.80%	1.10%	10.30%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	11.10%	14.30%	12.00%	5.40%	9.50%	4.50%	1.70%	1.10%	2.40%	3.80%	6.90%	1.70%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	5.60%	7.10%	8.00%	5.40%	6.30%	6.30%	2.80%	3.70%	3.00%	3.80%	9.20%	5.20%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	22.20%	28.60%	20.00%	18.90%	9.50%	4.50%	5.00%	4.80%	5.40%	3.80%	4.60%	6.90%
ME	4	Maine State Zone B Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	11.10%	7.10%	4.00%	2.70%	3.20%	4.50%	5.00%	5.30%	5.40%	9.10%	8.00%	6.90%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	1	1 to 100	0.00%	0.00%	0.00%	0.00%	4.80%	24.30%	35.40%	33.90%	31.30%	20.50%	5.70%	15.50%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	1	101 to 300	0.00%	0.00%	0.00%	10.80%	12.70%	10.80%	10.50%	10.60%	11.40%	11.40%	9.20%	6.90%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	1	301 to 500	11.10%	7.10%	4.00%	5.40%	6.30%	9.00%	8.30%	3.70%	3.60%	3.00%	9.20%	0.00%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	1	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	2.70%	7.90%	6.30%	9.90%	9.50%	8.40%	12.10%	5.70%	3.40%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	2	1 to 100	0.00%	0.00%	4.00%	5.40%	0.00%	0.90%	1.10%	1.60%	1.80%	2.30%	3.40%	8.60%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	2	101 to 300	11.10%	14.30%	16.00%	27.00%	19.00%	9.00%	2.20%	2.60%	3.60%	5.30%	9.20%	12.10%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	2	301 to 500	0.00%	0.00%	12.00%	8.10%	9.50%	10.80%	5.50%	6.30%	4.20%	7.60%	9.20%	10.30%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	2	501 to 700 adjusted for max traps	27.80%	21.40%	16.00%	8.10%	7.90%	8.10%	11.60%	15.90%	18.10%	16.70%	18.40%	12.10%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	4.00%	0.00%	3.20%	0.90%	1.10%	1.10%	1.20%	0.80%	1.10%	10.30%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	101 to 300	11.10%	14.30%	12.00%	5.40%	9.50%	4.50%	1.70%	1.10%	2.40%	3.80%	6.90%	1.70%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	301 to 500	5.60%	7.10%	8.00%	5.40%	6.30%	6.30%	2.80%	3.70%	3.00%	3.80%	9.20%	5.20%
ME	5	Maine State Zone B Exempt Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	501 to 700 adjusted for max traps	33.30%	35.70%	24.00%	21.60%	12.70%	9.00%	9.90%	10.10%	10.80%	12.90%	12.60%	13.80%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	1	1 to 100	3.60%	0.00%	0.00%	8.00%	2.40%	11.40%	19.30%	20.30%	16.00%	9.60%	8.60%	6.00%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	1	101 to 300	3.60%	4.50%	0.00%	2.00%	8.20%	9.50%	6.90%	7.30%	7.10%	6.20%	6.60%	4.50%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	1	301 to 500	0.00%	0.00%	0.00%	6.00%	2.40%	3.80%	4.10%	3.90%	4.20%	4.00%	2.60%	1.50%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	1	501 to 700	0.00%	0.00%	0.00%	0.00%	2.40%	4.40%	3.20%	2.60%	3.30%	2.80%	2.00%	0.00%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	1	701+	0.00%	0.00%	0.00%	4.00%	3.50%	2.50%	5.50%	5.20%	7.10%	2.80%	2.60%	1.50%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	2	1 to 100	3.60%	4.50%	0.00%	2.00%	1.20%	1.30%	0.00%	0.40%	0.00%	0.00%	5.30%	7.50%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	2	101 to 300	10.70%	9.10%	14.30%	8.00%	11.80%	5.70%	3.20%	2.60%	2.40%	5.60%	7.90%	14.90%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	2	301 to 500	0.00%	4.50%	3.60%	6.00%	15.30%	12.70%	6.40%	4.70%	4.70%	7.90%	12.60%	7.50%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	2	501 to 700	10.70%	0.00%	10.70%	6.00%	7.10%	13.30%	9.60%	8.20%	6.60%	7.90%	9.30%	6.00%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	2	701+	3.60%	4.50%	3.60%	6.00%	8.20%	7.00%	12.40%	15.10%	14.60%	16.40%	6.00%	7.50%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	0.00%	4.00%	0.00%	1.90%	3.70%	3.40%	3.80%	1.10%	3.30%	6.00%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	17.90%	22.70%	25.00%	16.00%	10.60%	3.80%	4.10%	4.30%	4.70%	4.50%	8.60%	9.00%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	14.30%	27.30%	21.40%	16.00%	11.80%	10.10%	5.00%	3.40%	3.80%	6.80%	6.60%	7.50%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	21.40%	13.60%	10.70%	10.00%	5.90%	5.70%	5.50%	5.60%	7.50%	8.50%	7.30%	9.00%
ME	6	Maine State Zone C Exempt Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	10.70%	9.10%	10.70%	6.00%	9.40%	7.00%	11.00%	12.90%	14.20%	15.80%	10.60%	11.90%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	1 to 100	3.60%	0.00%	0.00%	8.00%	2.40%	11.40%	19.30%	20.30%	16.00%	9.60%	8.60%	6.00%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	101 to 300	3.60%	4.50%	0.00%	2.00%	8.20%	9.50%	6.90%	7.30%	7.10%	6.20%	6.60%	4.50%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	301 to 500	0.00%	0.00%	0.00%	6.00%	2.40%	3.80%	4.10%	3.90%	4.20%	4.00%	2.60%	1.50%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	501 to 700	0.00%	0.00%	0.00%	0.00%	2.40%	4.40%	3.20%	2.60%	3.30%	2.80%	2.00%	0.00%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	701+	0.00%	0.00%	0.00%	4.00%	3.50%	2.50%	5.50%	5.20%	7.10%	2.80%	2.60%	1.50%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	1 to 100	3.60%	4.50%	0.00%	2.00%	1.20%	1.30%	0.00%	0.40%	0.00%	0.00%	5.30%	7.50%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	101 to 300	10.70%	9.10%	14.30%	8.00%	11.80%	5.70%	3.20%	2.60%	2.40%	5.60%	7.90%	14.90%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	301 to 500	0.00%	4.50%	3.60%	6.00%	15.30%	12.70%	6.40%	4.70%	4.70%	7.90%	12.60%	7.50%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	501 to 700	10.70%	0.00%	10.70%	6.00%	7.10%	13.30%	9.60%	8.20%	6.60%	7.90%	9.30%	6.00%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	701+	3.60%	4.50%	3.60%	6.00%	8.20%	7.00%	12.40%	15.10%	14.60%	16.40%	6.00%	7.50%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	0.00%	4.00%	0.00%	1.90%	3.70%	3.40%	3.80%	1.10%	3.30%	6.00%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	17.90%	22.70%	25.00%	16.00%	10.60%	3.80%	4.10%	4.30%	4.70%	4.50%	8.60%	9.00%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	14.30%	27.30%	21.40%	16.00%	11.80%	10.10%	5.00%	3.40%	3.80%	6.80%	6.60%	7.50%
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	21.40%	13.60%	10.70%	10.00%	5.90%	5.70%	5.50%	5.60%	7.50%	8.50%	7.30%	9.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	7	Maine State Zone C Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	10.70%	9.10%	10.70%	6.00%	9.40%	7.00%	11.00%	12.90%	14.20%	15.80%	10.60%	11.90%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	1 to 100	3.00%	0.00%	7.40%	9.80%	14.90%	20.50%	29.70%	27.90%	23.60%	20.40%	12.40%	7.60%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	101 to 300	12.10%	9.50%	14.80%	12.20%	16.20%	16.00%	11.40%	10.00%	10.60%	11.20%	11.20%	15.20%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	301 to 500	6.10%	0.00%	3.70%	12.20%	13.50%	9.00%	6.60%	6.70%	6.50%	7.80%	7.50%	1.10%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	501 to 700	6.10%	4.80%	7.40%	2.40%	1.40%	7.70%	7.90%	8.30%	8.80%	8.30%	8.10%	3.30%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	1	701+	0.00%	0.00%	0.00%	0.00%	2.70%	7.10%	12.20%	13.30%	10.20%	8.70%	3.70%	3.30%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	1 to 100	0.00%	0.00%	0.00%	4.90%	1.40%	2.60%	0.90%	2.10%	1.40%	1.50%	1.90%	6.50%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	101 to 300	21.20%	23.80%	14.80%	17.10%	10.80%	3.80%	4.80%	3.80%	3.70%	3.40%	5.60%	6.50%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	301 to 500	9.10%	19.00%	14.80%	12.20%	4.10%	6.40%	1.70%	2.10%	0.90%	3.40%	9.30%	13.00%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	501 to 700	9.10%	4.80%	3.70%	2.40%	10.80%	4.50%	4.40%	4.20%	6.50%	5.80%	6.20%	8.70%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	2	701+	6.10%	4.80%	3.70%	4.90%	2.70%	3.20%	4.80%	5.80%	11.10%	10.70%	10.60%	3.30%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	4.80%	0.00%	4.90%	2.70%	2.60%	1.70%	2.10%	1.90%	0.50%	2.50%	5.40%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	3.00%	0.00%	7.40%	4.90%	4.10%	5.80%	2.20%	1.70%	1.40%	3.90%	5.00%	14.10%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	15.20%	14.30%	7.40%	4.90%	6.80%	3.20%	3.10%	3.80%	4.20%	4.40%	8.70%	4.30%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	0.00%	4.80%	3.70%	2.40%	4.10%	3.80%	5.20%	3.30%	2.80%	2.90%	5.00%	2.20%
ME	8	Maine State Zone D Exempt Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	9.10%	9.50%	11.10%	4.90%	4.10%	3.80%	3.50%	5.00%	6.50%	7.30%	2.50%	5.40%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	1	1 to 100	3.00%	0.00%	7.40%	9.80%	14.90%	20.50%	29.70%	27.90%	23.60%	20.40%	12.40%	7.60%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	1	101 to 300	12.10%	9.50%	14.80%	12.20%	16.20%	16.00%	11.40%	10.00%	10.60%	11.20%	11.20%	15.20%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	1	301 to 500	6.10%	0.00%	3.70%	12.20%	13.50%	9.00%	6.60%	6.70%	6.50%	7.80%	7.50%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	1	501 to 700	6.10%	4.80%	7.40%	2.40%	1.40%	7.70%	7.90%	8.30%	8.80%	8.30%	8.10%	3.30%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	1	701+	0.00%	0.00%	0.00%	0.00%	2.70%	7.10%	12.20%	13.30%	10.20%	8.70%	3.70%	3.30%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	2	1 to 100	0.00%	0.00%	0.00%	4.90%	1.40%	2.60%	0.90%	2.10%	1.40%	1.50%	1.90%	6.50%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	2	101 to 300	21.20%	23.80%	14.80%	17.10%	10.80%	3.80%	4.80%	3.80%	3.70%	3.40%	5.60%	6.50%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	2	301 to 500	9.10%	19.00%	14.80%	12.20%	4.10%	6.40%	1.70%	2.10%	0.90%	3.40%	9.30%	13.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	2	501 to 700	9.10%	4.80%	3.70%	2.40%	10.80%	4.50%	4.40%	4.20%	6.50%	5.80%	6.20%	8.70%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	2	701+	6.10%	4.80%	3.70%	4.90%	2.70%	3.20%	4.80%	5.80%	11.10%	10.70%	10.60%	3.30%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	3 to 4	1 to 100	0.00%	4.80%	0.00%	2.40%	1.40%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	3 to 4	101 to 300	0.00%	0.00%	0.00%	2.40%	1.40%	0.60%	0.00%	0.00%	0.00%	0.50%	0.00%	4.30%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	3 to 4	301 to 500	6.10%	9.50%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%	1.20%	1.10%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	1.40%	0.00%	0.90%	0.00%	0.00%	0.00%	1.20%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	3 to 4	701+	3.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.50%	1.00%	0.00%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	1.30%	1.30%	0.50%	0.00%	0.00%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	5 to 9	101 to 300	0.00%	0.00%	0.00%	0.00%	1.40%	2.60%	0.40%	0.00%	0.00%	1.00%	0.60%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	1.30%	1.30%	1.40%	1.50%	1.90%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	5 to 9	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	1.70%	1.70%	0.90%	1.00%	0.00%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	5 to 9	701+	0.00%	4.80%	3.70%	0.00%	0.00%	0.60%	0.90%	0.40%	0.50%	1.00%	1.20%	2.20%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	10 to 14	1 to 100	0.00%	0.00%	0.00%	2.40%	0.00%	0.60%	0.40%	0.80%	1.40%	0.50%	2.50%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	10 to 14	101 to 300	3.00%	0.00%	0.00%	0.00%	0.00%	1.30%	1.30%	1.30%	0.90%	1.90%	3.10%	7.60%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	10 to 14	301 to 500	6.10%	0.00%	0.00%	0.00%	2.70%	0.60%	0.90%	1.70%	0.90%	0.50%	1.90%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	10 to 14	501 to 700	0.00%	4.80%	3.70%	2.40%	1.40%	1.30%	1.70%	1.30%	1.40%	1.00%	3.70%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	10 to 14	701+	3.00%	0.00%	3.70%	0.00%	0.00%	1.90%	1.30%	2.90%	3.20%	2.90%	0.00%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	15 to 19	101 to 300	0.00%	0.00%	7.40%	2.40%	0.00%	0.60%	0.00%	0.40%	0.00%	0.00%	1.20%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	15 to 19	301 to 500	3.00%	4.80%	3.70%	2.40%	2.70%	0.60%	0.90%	0.40%	0.50%	1.00%	1.20%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	0.00%	0.50%	1.00%	0.00%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	15 to 19	701+	3.00%	4.80%	3.70%	4.90%	2.70%	0.60%	0.90%	0.40%	1.40%	2.40%	0.60%	1.10%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	1.40%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	1.40%	0.60%	0.40%	0.00%	0.50%	0.50%	0.00%	2.20%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	20 to 39	301 to 500	0.00%	0.00%	0.00%	2.40%	1.40%	1.30%	0.00%	0.40%	0.50%	0.50%	2.50%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	1.40%	1.90%	0.00%	0.40%	0.00%	0.00%	0.00%	0.00%
ME	9	Maine State Zone D Exempt Penobscot Bay Closed Area	20 to 39	701+	0.00%	0.00%	0.00%	0.00%	1.40%	0.60%	0.40%	0.80%	0.90%	0.00%	0.60%	0.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	1	1 to 100	5.90%	0.00%	9.10%	23.50%	35.10%	38.70%	37.10%	37.30%	35.60%	26.40%	12.10%	14.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	1	101 to 300	5.90%	9.10%	9.10%	5.90%	18.90%	17.20%	16.40%	16.90%	14.40%	19.80%	22.70%	16.30%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	1	301 to 500	5.90%	9.10%	0.00%	0.00%	2.70%	6.50%	5.20%	4.20%	6.70%	6.60%	9.10%	7.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	1	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%	11.20%	11.00%	12.50%	12.10%	12.10%	4.70%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2	1 to 100	11.80%	18.20%	18.20%	17.60%	5.40%	3.20%	2.60%	1.70%	1.90%	1.10%	0.00%	2.30%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2 adjusted for max tpt	1 to 100	5.90%	0.00%	0.00%	0.00%	0.00%	1.10%	1.70%	0.80%	1.00%	3.30%	1.50%	0.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2	101 to 300	17.60%	9.10%	9.10%	23.50%	16.20%	7.50%	5.20%	5.90%	4.80%	6.60%	10.60%	11.60%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2 adjusted for max tpt	101 to 300	17.60%	18.20%	18.20%	5.90%	5.40%	3.20%	0.00%	0.80%	3.80%	1.10%	1.50%	7.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2	301 to 500	5.90%	9.10%	18.20%	5.90%	5.40%	7.50%	4.30%	5.90%	5.80%	4.40%	6.10%	14.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2 adjusted for max tpt	301 to 500	11.80%	9.10%	18.20%	11.80%	8.10%	6.50%	4.30%	1.70%	0.00%	0.00%	7.60%	7.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%	3.40%	3.40%	3.80%	6.60%	4.50%	2.30%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2 adjusted for max tpt	501 to 700	5.90%	9.10%	0.00%	5.90%	2.70%	4.30%	8.60%	10.20%	9.60%	12.10%	12.10%	14.00%
ME	10	Maine State Zone E Exempt Linekin Bay Trawl Limits	2 adjusted for max tpt	701+	5.90%	9.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	1	1 to 100	5.90%	0.00%	9.10%	23.50%	35.10%	38.70%	37.10%	37.30%	35.60%	26.40%	12.10%	14.00%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	1	101 to 300	5.90%	9.10%	9.10%	5.90%	18.90%	17.20%	16.40%	16.90%	14.40%	19.80%	22.70%	16.30%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	1	301 to 500	5.90%	9.10%	0.00%	0.00%	2.70%	6.50%	5.20%	4.20%	6.70%	6.60%	9.10%	7.00%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	1	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%	11.20%	11.00%	12.50%	12.10%	12.10%	4.70%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	2	1 to 100	11.80%	18.20%	18.20%	17.60%	5.40%	3.20%	2.60%	1.70%	1.90%	1.10%	0.00%	2.30%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	2	101 to 300	17.60%	9.10%	9.10%	23.50%	16.20%	7.50%	5.20%	5.90%	4.80%	6.60%	10.60%	11.60%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	2	301 to 500	5.90%	9.10%	18.20%	5.90%	5.40%	7.50%	4.30%	5.90%	5.80%	4.40%	6.10%	14.00%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	2	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%	3.40%	3.40%	3.80%	6.60%	4.50%	2.30%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	3 to 4 adjusted for max tpt - 3	1 to 100	5.90%	0.00%	0.00%	0.00%	0.00%	1.10%	1.70%	0.80%	1.00%	3.30%	1.50%	0.00%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	3 to 4 adjusted for max tpt - 3	101 to 300	17.60%	18.20%	18.20%	5.90%	5.40%	3.20%	0.00%	0.80%	3.80%	1.10%	1.50%	7.00%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	3 to 4 adjusted for max tpt - 3	301 to 500	11.80%	9.10%	18.20%	11.80%	8.10%	6.50%	4.30%	1.70%	0.00%	0.00%	7.60%	7.00%
ME	11	Maine State Zone E Exempt Sheepscot Bay and Sequin Island Trawl Limits & Zone E Trap Limits	3 to 4 adjusted for max tpt - 3	501 to 700 adjusted for max traps	11.80%	18.20%	0.00%	5.90%	2.70%	4.30%	8.60%	10.20%	9.60%	12.10%	12.10%	14.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	1	1 to 100	5.90%	0.00%	9.10%	23.50%	35.10%	38.70%	37.10%	37.30%	35.60%	26.40%	12.10%	14.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	1	101 to 300	5.90%	9.10%	9.10%	5.90%	18.90%	17.20%	16.40%	16.90%	14.40%	19.80%	22.70%	16.30%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	1	301 to 500	5.90%	9.10%	0.00%	0.00%	2.70%	6.50%	5.20%	4.20%	6.70%	6.60%	9.10%	7.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	1	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%	11.20%	11.00%	12.50%	12.10%	12.10%	4.70%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	2	1 to 100	11.80%	18.20%	18.20%	17.60%	5.40%	3.20%	2.60%	1.70%	1.90%	1.10%	0.00%	2.30%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	2	101 to 300	17.60%	9.10%	9.10%	23.50%	16.20%	7.50%	5.20%	5.90%	4.80%	6.60%	10.60%	11.60%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	2	301 to 500	5.90%	9.10%	18.20%	5.90%	5.40%	7.50%	4.30%	5.90%	5.80%	4.40%	6.10%	14.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	2	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%	3.40%	3.40%	3.80%	6.60%	4.50%	2.30%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	2.20%	1.50%	0.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	3 to 4	101 to 300	0.00%	0.00%	0.00%	0.00%	2.70%	1.10%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	3 to 4	301 to 500	0.00%	9.10%	0.00%	0.00%	2.70%	1.10%	1.70%	0.80%	0.00%	0.00%	1.50%	4.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	12	Maine State Zone E Exempt Zone E Trap Limits	3 to 4	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	2.60%	2.50%	1.90%	3.30%	1.50%	2.30%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	5 to 9	1 to 100	5.90%	0.00%	0.00%	0.00%	0.00%	1.10%	1.70%	0.80%	0.00%	1.10%	0.00%	0.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	5 to 9	101 to 300	17.60%	18.20%	18.20%	5.90%	2.70%	2.20%	0.00%	0.80%	1.90%	1.10%	1.50%	7.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	5 to 9	301 to 500	11.80%	0.00%	18.20%	11.80%	5.40%	5.40%	2.60%	0.80%	0.00%	0.00%	3.00%	2.30%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	5 to 9	501 to 700 adjusted for max traps	5.90%	9.10%	0.00%	5.90%	2.70%	3.20%	6.00%	7.60%	7.70%	7.70%	10.60%	11.60%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	10 to 14	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	0.00%	0.00%
ME	12	Maine State Zone E Exempt Zone E Trap Limits	20 to 39	501 to 700 adjusted for max traps	5.90%	9.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	1	1 to 100	4.80%	0.00%	5.90%	18.50%	18.80%	37.20%	41.00%	36.90%	33.30%	22.70%	9.80%	5.60%
ME	13	Maine State Zone F Exempt	1	101 to 300	4.80%	9.10%	5.90%	7.40%	4.20%	5.80%	6.80%	7.80%	8.50%	6.40%	5.90%	5.60%
ME	13	Maine State Zone F Exempt	1	301 to 500	0.00%	0.00%	0.00%	0.00%	2.10%	2.20%	2.00%	2.90%	2.80%	4.30%	2.00%	1.90%
ME	13	Maine State Zone F Exempt	1	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.50%	1.10%	0.70%	2.00%	0.00%
ME	13	Maine State Zone F Exempt	2	1 to 100	0.00%	0.00%	0.00%	0.00%	4.20%	2.90%	2.00%	2.40%	1.70%	1.40%	2.90%	0.00%
ME	13	Maine State Zone F Exempt	2	101 to 300	23.80%	27.30%	23.50%	7.40%	8.30%	5.10%	4.40%	4.40%	5.10%	6.40%	5.90%	7.40%
ME	13	Maine State Zone F Exempt	2	301 to 500	0.00%	0.00%	0.00%	3.70%	2.10%	1.50%	2.00%	1.90%	2.80%	3.50%	4.90%	1.90%
ME	13	Maine State Zone F Exempt	2	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	0.50%	0.00%	0.00%	1.00%	0.00%
ME	13	Maine State Zone F Exempt	2	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	1.50%	1.10%	2.10%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	2.10%	2.20%	0.50%	0.50%	0.00%	1.40%	0.00%	1.90%
ME	13	Maine State Zone F Exempt	3 to 4	101 to 300	4.80%	0.00%	0.00%	3.70%	4.20%	2.20%	1.00%	1.00%	1.70%	1.40%	3.90%	0.00%
ME	13	Maine State Zone F Exempt	3 to 4	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.50%	1.00%	1.10%	1.40%	1.00%	0.00%
ME	13	Maine State Zone F Exempt	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	1.50%	0.50%	1.10%	0.70%	1.00%	0.00%
ME	13	Maine State Zone F Exempt	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	5 to 9	1 to 100	9.50%	18.20%	5.90%	3.70%	0.00%	0.00%	1.00%	1.50%	1.10%	0.70%	2.00%	5.60%
ME	13	Maine State Zone F Exempt	5 to 9	101 to 300	9.50%	9.10%	17.60%	11.10%	20.80%	5.80%	1.50%	1.90%	1.70%	2.80%	5.90%	7.40%
ME	13	Maine State Zone F Exempt	5 to 9	301 to 500	9.50%	0.00%	11.80%	7.40%	2.10%	9.50%	3.90%	3.40%	2.80%	2.80%	9.80%	14.80%
ME	13	Maine State Zone F Exempt	5 to 9	501 to 700	4.80%	0.00%	5.90%	3.70%	8.30%	7.30%	7.30%	6.30%	5.10%	6.40%	6.90%	9.30%
ME	13	Maine State Zone F Exempt	5 to 9	701+	9.50%	18.20%	0.00%	3.70%	4.20%	7.30%	12.70%	17.00%	18.10%	22.00%	20.60%	11.10%
ME	13	Maine State Zone F Exempt	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	1.00%	1.90%
ME	13	Maine State Zone F Exempt	10 to 14	101 to 300	0.00%	0.00%	0.00%	7.40%	2.10%	2.20%	0.00%	0.00%	0.60%	0.70%	2.00%	9.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	13	Maine State Zone F Exempt	10 to 14	301 to 500	0.00%	0.00%	0.00%	3.70%	6.30%	2.90%	1.50%	1.50%	1.70%	3.50%	3.90%	1.90%
ME	13	Maine State Zone F Exempt	10 to 14	501 to 700	4.80%	18.20%	0.00%	0.00%	2.10%	0.70%	2.90%	1.50%	2.80%	4.30%	2.90%	0.00%
ME	13	Maine State Zone F Exempt	10 to 14	701+	9.50%	0.00%	5.90%	3.70%	2.10%	2.20%	3.40%	2.90%	3.40%	3.50%	3.90%	7.40%
ME	13	Maine State Zone F Exempt	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	2.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	15 to 19	501 to 700	0.00%	0.00%	5.90%	3.70%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	15 to 19	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.60%	0.00%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	20 to 39	1 to 100	4.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	1.90%
ME	13	Maine State Zone F Exempt	20 to 39	101 to 300	0.00%	0.00%	5.90%	7.40%	2.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	13	Maine State Zone F Exempt	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	1.00%	1.90%
ME	13	Maine State Zone F Exempt	20 to 39	701+	0.00%	0.00%	5.90%	3.70%	2.10%	0.00%	0.50%	0.50%	0.60%	0.70%	0.00%	3.70%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	1	1 to 100	4.80%	0.00%	5.90%	18.50%	18.80%	37.20%	41.00%	36.90%	33.30%	22.70%	9.80%	5.60%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	1	101 to 300	4.80%	9.10%	5.90%	7.40%	4.20%	5.80%	6.80%	7.80%	8.50%	6.40%	5.90%	5.60%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	1	301 to 500	0.00%	0.00%	0.00%	0.00%	2.10%	2.20%	2.00%	2.90%	2.80%	4.30%	2.00%	1.90%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	1	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.50%	1.10%	0.70%	2.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	2	1 to 100	0.00%	0.00%	0.00%	0.00%	4.20%	2.90%	2.00%	2.40%	1.70%	1.40%	2.90%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	2	101 to 300	23.80%	27.30%	23.50%	7.40%	8.30%	5.10%	4.40%	4.40%	5.10%	6.40%	5.90%	7.40%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	2	301 to 500	0.00%	0.00%	0.00%	3.70%	2.10%	1.50%	2.00%	1.90%	2.80%	3.50%	4.90%	1.90%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	2	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	0.50%	0.00%	0.00%	1.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	2	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	1.50%	1.10%	2.10%	0.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	2.10%	2.20%	0.50%	0.50%	0.00%	1.40%	0.00%	1.90%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	3 to 4	101 to 300	4.80%	0.00%	0.00%	3.70%	4.20%	2.20%	1.00%	1.00%	1.70%	1.40%	3.90%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	3 to 4	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.50%	1.00%	1.10%	1.40%	1.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	1.50%	0.50%	1.10%	0.70%	1.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	5 to 9	1 to 100	9.50%	18.20%	5.90%	3.70%	0.00%	0.00%	1.00%	1.50%	1.10%	0.70%	2.00%	5.60%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	5 to 9	101 to 300	9.50%	9.10%	17.60%	11.10%	20.80%	5.80%	1.50%	1.90%	1.70%	2.80%	5.90%	7.40%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	5 to 9	301 to 500	9.50%	0.00%	11.80%	7.40%	2.10%	9.50%	3.90%	3.40%	2.80%	2.80%	9.80%	14.80%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	5 to 9	501 to 700	4.80%	0.00%	5.90%	3.70%	8.30%	7.30%	7.30%	6.30%	5.10%	6.40%	6.90%	9.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	5 to 9	701+	9.50%	18.20%	0.00%	3.70%	4.20%	7.30%	12.70%	17.00%	18.10%	22.00%	20.60%	11.10%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	1.00%	1.90%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 14	101 to 300	0.00%	0.00%	0.00%	7.40%	2.10%	2.20%	0.00%	0.00%	0.60%	0.70%	2.00%	9.30%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 14	301 to 500	0.00%	0.00%	0.00%	3.70%	6.30%	2.90%	1.50%	1.50%	1.70%	3.50%	3.90%	1.90%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 14	501 to 700	4.80%	18.20%	0.00%	0.00%	2.10%	0.70%	2.90%	1.50%	2.80%	4.30%	2.90%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 14	701+	9.50%	0.00%	5.90%	3.70%	2.10%	2.20%	3.40%	2.90%	3.40%	3.50%	3.90%	7.40%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 15 adjusted for max tpt - 12	1 to 100	4.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.60%	0.00%	0.00%	1.90%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 15 adjusted for max tpt - 12	101 to 300	0.00%	0.00%	5.90%	7.40%	4.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 15 adjusted for max tpt - 12	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	1.00%	1.90%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 15 adjusted for max tpt - 12	501 to 700	0.00%	0.00%	5.90%	3.70%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%
ME	14	Maine State Zone F Exempt Casco Bay Trawl Limits	10 to 15 adjusted for max tpt - 12	701+	0.00%	0.00%	5.90%	3.70%	2.10%	0.00%	0.50%	1.00%	1.10%	0.70%	0.00%	3.70%
ME	15	Maine State Zone G Exempt	1	1 to 100	0.00%	0.00%	6.70%	14.80%	28.30%	41.90%	49.10%	48.60%	46.40%	40.00%	13.00%	3.10%
ME	15	Maine State Zone G Exempt	1	101 to 300	13.30%	7.70%	26.70%	25.90%	10.90%	10.80%	9.40%	9.90%	8.20%	5.30%	8.70%	15.60%
ME	15	Maine State Zone G Exempt	1	301 to 500	6.70%	0.00%	0.00%	7.40%	15.20%	6.80%	2.80%	2.70%	3.10%	5.30%	8.70%	0.00%
ME	15	Maine State Zone G Exempt	1	501 to 700	6.70%	0.00%	6.70%	0.00%	2.20%	4.10%	4.70%	3.60%	5.20%	2.70%	6.50%	6.30%
ME	15	Maine State Zone G Exempt	1	701+	0.00%	0.00%	0.00%	0.00%	4.30%	4.10%	3.80%	4.50%	4.10%	6.70%	0.00%	0.00%
ME	15	Maine State Zone G Exempt	2	1 to 100	6.70%	7.70%	6.70%	7.40%	4.30%	1.40%	1.90%	1.80%	3.10%	4.00%	4.30%	6.30%
ME	15	Maine State Zone G Exempt	2	101 to 300	6.70%	15.40%	13.30%	11.10%	4.30%	6.80%	1.90%	1.80%	3.10%	1.30%	2.20%	6.30%
ME	15	Maine State Zone G Exempt	2	301 to 500	0.00%	0.00%	0.00%	3.70%	4.30%	1.40%	1.90%	0.90%	1.00%	2.70%	4.30%	9.40%
ME	15	Maine State Zone G Exempt	2	501 to 700	0.00%	0.00%	0.00%	3.70%	0.00%	0.00%	3.80%	1.80%	4.10%	5.30%	2.20%	3.10%
ME	15	Maine State Zone G Exempt	2	701+	6.70%	15.40%	0.00%	7.40%	2.20%	4.10%	1.90%	2.70%	2.10%	2.70%	4.30%	0.00%
ME	15	Maine State Zone G Exempt	3 to 4	1 to 100	13.30%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.90%	1.00%	1.30%	2.20%	3.10%
ME	15	Maine State Zone G Exempt	3 to 4	101 to 300	6.70%	15.40%	13.30%	0.00%	2.20%	1.40%	1.90%	1.80%	3.10%	4.00%	6.50%	6.30%
ME	15	Maine State Zone G Exempt	3 to 4	301 to 500	13.30%	7.70%	13.30%	0.00%	6.50%	1.40%	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%
ME	15	Maine State Zone G Exempt	3 to 4	501 to 700	0.00%	7.70%	0.00%	0.00%	2.20%	1.40%	0.00%	2.70%	2.10%	1.30%	2.20%	0.00%
ME	15	Maine State Zone G Exempt	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	4.70%	1.80%	2.10%	1.30%	2.20%	3.10%
ME	15	Maine State Zone G Exempt	5 to 9	1 to 100	0.00%	0.00%	0.00%	3.70%	2.20%	0.00%	0.90%	1.80%	0.00%	0.00%	2.20%	6.30%
ME	15	Maine State Zone G Exempt	5 to 9	101 to 300	6.70%	7.70%	6.70%	3.70%	0.00%	4.10%	0.90%	0.90%	0.00%	1.30%	4.30%	0.00%
ME	15	Maine State Zone G Exempt	5 to 9	301 to 500	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	15	Maine State Zone G Exempt	5 to 9	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	0.00%	0.90%	0.00%	1.30%	0.00%	0.00%
ME	15	Maine State Zone G Exempt	5 to 9	701+	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	2.80%	5.40%	5.20%	5.30%	8.70%	3.10%
ME	15	Maine State Zone G Exempt	10 to 14	1 to 100	0.00%	0.00%	0.00%	3.70%	2.20%	0.00%	0.00%	0.00%	1.00%	0.00%	4.30%	3.10%
ME	15	Maine State Zone G Exempt	10 to 14	101 to 300	0.00%	0.00%	0.00%	3.70%	2.20%	1.40%	2.80%	1.80%	1.00%	1.30%	0.00%	0.00%
ME	15	Maine State Zone G Exempt	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	2.20%	2.70%	2.80%	0.90%	2.10%	4.00%	4.30%	6.30%
ME	15	Maine State Zone G Exempt	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	1.00%	0.00%	0.00%	3.10%
ME	15	Maine State Zone G Exempt	10 to 14	701+	0.00%	0.00%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	1.00%	1.30%	2.20%	6.30%
ME	15	Maine State Zone G Exempt	15 to 19	101 to 300	0.00%	7.70%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	15	Maine State Zone G Exempt	15 to 19	701+	0.00%	0.00%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	15	Maine State Zone G Exempt	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	0.00%	0.90%	0.00%	1.30%	2.20%	0.00%
ME	15	Maine State Zone G Exempt	20 to 39	701+	6.70%	7.70%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	1	1 to 100	0.00%	0.00%	6.70%	14.80%	28.30%	41.90%	49.10%	48.60%	46.40%	40.00%	13.00%	3.10%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	1	101 to 300	13.30%	7.70%	26.70%	25.90%	10.90%	10.80%	9.40%	9.90%	8.20%	5.30%	8.70%	15.60%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	1	301 to 500	6.70%	0.00%	0.00%	7.40%	15.20%	6.80%	2.80%	2.70%	3.10%	5.30%	8.70%	0.00%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	1	501 to 700	6.70%	0.00%	6.70%	0.00%	2.20%	4.10%	4.70%	3.60%	5.20%	2.70%	6.50%	6.30%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	1	701+	0.00%	0.00%	0.00%	0.00%	4.30%	4.10%	3.80%	4.50%	4.10%	6.70%	0.00%	0.00%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	2	1 to 100	6.70%	7.70%	6.70%	7.40%	4.30%	1.40%	1.90%	1.80%	3.10%	4.00%	4.30%	6.30%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	2	101 to 300	6.70%	15.40%	13.30%	11.10%	4.30%	6.80%	1.90%	1.80%	3.10%	1.30%	2.20%	6.30%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	2	301 to 500	0.00%	0.00%	0.00%	3.70%	4.30%	1.40%	1.90%	0.90%	1.00%	2.70%	4.30%	9.40%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	2	501 to 700	0.00%	0.00%	0.00%	3.70%	0.00%	0.00%	3.80%	1.80%	4.10%	5.30%	2.20%	3.10%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	2	701+	6.70%	15.40%	0.00%	7.40%	2.20%	4.10%	1.90%	2.70%	2.10%	2.70%	4.30%	0.00%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	13.30%	0.00%	0.00%	7.40%	4.30%	0.00%	2.80%	2.70%	2.10%	1.30%	8.70%	12.50%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	13.30%	30.80%	20.00%	7.40%	6.50%	8.10%	5.70%	5.40%	4.10%	8.00%	13.00%	6.30%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	20.00%	7.70%	13.30%	0.00%	8.70%	4.10%	2.80%	0.90%	2.10%	4.00%	8.70%	12.50%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	0.00%	7.70%	0.00%	0.00%	2.20%	2.70%	0.00%	5.40%	3.10%	2.70%	2.20%	3.10%
ME	16	Maine State Zone G Exempt Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	6.70%	7.70%	6.70%	3.70%	2.20%	4.10%	7.50%	7.20%	8.20%	8.00%	13.00%	15.60%
ME	17	Maine State Zone A	2	1 to 100	0.00%	0.00%	20.00%	10.80%	12.30%	12.60%	25.10%	23.80%	21.40%	16.90%	14.90%	8.70%
ME	17	Maine State Zone A	2	101 to 300	50.00%	25.00%	10.00%	27.00%	21.00%	21.50%	18.80%	18.30%	19.10%	16.40%	20.90%	17.40%
ME	17	Maine State Zone A	2	301 to 500	0.00%	0.00%	0.00%	13.50%	22.20%	15.60%	8.50%	8.90%	10.50%	14.80%	14.90%	13.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	17	Maine State Zone A	2	501 to 700	0.00%	25.00%	10.00%	10.80%	6.20%	9.60%	13.90%	10.60%	9.10%	8.50%	7.50%	6.50%
ME	17	Maine State Zone A	2	701+	0.00%	0.00%	0.00%	2.70%	7.40%	9.60%	11.70%	17.90%	17.30%	17.50%	8.20%	2.20%
ME	17	Maine State Zone A	3 to 4	1 to 100	0.00%	0.00%	0.00%	2.70%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%
ME	17	Maine State Zone A	3 to 4	101 to 300	0.00%	25.00%	10.00%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%	2.20%	4.30%
ME	17	Maine State Zone A	3 to 4	301 to 500	0.00%	0.00%	10.00%	0.00%	3.70%	1.50%	1.80%	1.30%	0.50%	1.10%	0.70%	2.20%
ME	17	Maine State Zone A	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.90%	0.90%	1.40%	1.60%	0.70%	0.00%
ME	17	Maine State Zone A	3 to 4	701+	0.00%	0.00%	0.00%	2.70%	1.20%	2.20%	1.30%	2.60%	3.20%	1.60%	0.70%	0.00%
ME	17	Maine State Zone A	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%
ME	17	Maine State Zone A	5 to 9	101 to 300	0.00%	0.00%	0.00%	0.00%	2.50%	1.50%	0.40%	0.00%	0.00%	0.00%	3.70%	0.00%
ME	17	Maine State Zone A	5 to 9	301 to 500	0.00%	25.00%	10.00%	2.70%	0.00%	2.20%	0.40%	0.90%	0.90%	2.60%	3.00%	4.30%
ME	17	Maine State Zone A	5 to 9	501 to 700	12.50%	0.00%	0.00%	2.70%	1.20%	0.70%	0.00%	0.00%	0.50%	0.50%	1.50%	2.20%
ME	17	Maine State Zone A	5 to 9	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	1.30%	1.40%	1.60%	1.50%	0.00%
ME	17	Maine State Zone A	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	1.20%	0.00%	1.30%	0.90%	0.00%	0.00%	0.70%	4.30%
ME	17	Maine State Zone A	10 to 14	101 to 300	12.50%	0.00%	10.00%	0.00%	1.20%	3.70%	1.30%	0.40%	0.90%	1.60%	1.50%	2.20%
ME	17	Maine State Zone A	10 to 14	301 to 500	0.00%	0.00%	0.00%	2.70%	0.00%	0.70%	0.90%	1.30%	0.90%	0.50%	2.20%	2.20%
ME	17	Maine State Zone A	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	1.20%	2.20%	2.70%	1.30%	0.90%	1.10%	1.50%	0.00%
ME	17	Maine State Zone A	10 to 14	701+	0.00%	0.00%	10.00%	0.00%	1.20%	0.00%	0.40%	1.30%	2.30%	1.60%	2.20%	4.30%
ME	17	Maine State Zone A	15 to 19	101 to 300	12.50%	0.00%	10.00%	8.10%	4.90%	3.00%	1.30%	0.90%	1.40%	1.10%	0.70%	0.00%
ME	17	Maine State Zone A	15 to 19	301 to 500	12.50%	0.00%	0.00%	2.70%	1.20%	0.70%	0.00%	0.40%	0.90%	0.00%	0.70%	0.00%
ME	17	Maine State Zone A	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	2.50%	1.50%	0.40%	0.40%	0.50%	0.50%	0.70%	6.50%
ME	17	Maine State Zone A	15 to 19	701+	0.00%	0.00%	0.00%	2.70%	1.20%	0.70%	2.20%	2.60%	3.60%	5.30%	4.50%	4.30%
ME	17	Maine State Zone A	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.50%	0.70%	0.00%
ME	17	Maine State Zone A	20 to 39	101 to 300	0.00%	0.00%	0.00%	5.40%	0.00%	0.70%	0.90%	0.40%	0.00%	0.50%	0.00%	0.00%
ME	17	Maine State Zone A	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	4.90%	1.50%	0.90%	1.70%	0.90%	1.10%	0.70%	6.50%
ME	17	Maine State Zone A	20 to 39	501 to 700	0.00%	0.00%	0.00%	2.70%	1.20%	2.20%	2.20%	0.90%	1.40%	1.10%	0.70%	4.30%
ME	17	Maine State Zone A	20 to 39	701+	0.00%	0.00%	0.00%	0.00%	1.20%	0.70%	0.90%	1.30%	1.40%	2.10%	1.50%	2.20%
ME	18	Maine State Zone B Hancock County Trawl Limits	2	1 to 100	0.00%	0.00%	4.00%	5.40%	4.80%	25.20%	36.50%	35.40%	33.10%	22.70%	9.20%	24.10%
ME	18	Maine State Zone B Hancock County Trawl Limits	2	101 to 300	11.10%	14.30%	16.00%	37.80%	31.70%	19.80%	12.70%	13.20%	15.10%	16.70%	18.40%	19.00%
ME	18	Maine State Zone B Hancock County Trawl Limits	2	301 to 500	11.10%	7.10%	16.00%	13.50%	15.90%	19.80%	13.80%	10.10%	7.80%	10.60%	18.40%	10.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	18	Maine State Zone B Hancock County Trawl Limits	2	501 to 700	16.70%	14.30%	12.00%	2.70%	7.90%	5.40%	10.50%	8.50%	9.00%	16.70%	17.20%	12.10%
ME	18	Maine State Zone B Hancock County Trawl Limits	2	701+	11.10%	7.10%	4.00%	8.10%	7.90%	9.00%	11.00%	16.90%	17.50%	12.10%	6.90%	3.40%
ME	18	Maine State Zone B Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	4.00%	0.00%	3.20%	0.90%	1.10%	1.10%	1.20%	0.80%	1.10%	10.30%
ME	18	Maine State Zone B Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	11.10%	14.30%	12.00%	5.40%	9.50%	4.50%	1.70%	1.10%	2.40%	3.80%	6.90%	1.70%
ME	18	Maine State Zone B Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	5.60%	7.10%	8.00%	5.40%	6.30%	6.30%	2.80%	3.70%	3.00%	3.80%	9.20%	5.20%
ME	18	Maine State Zone B Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	22.20%	28.60%	20.00%	18.90%	9.50%	4.50%	5.00%	4.80%	5.40%	3.80%	4.60%	6.90%
ME	18	Maine State Zone B Hancock County Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	11.10%	7.10%	4.00%	2.70%	3.20%	4.50%	5.00%	5.30%	5.40%	9.10%	8.00%	6.90%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	2	1 to 100	0.00%	0.00%	4.00%	5.40%	4.80%	25.20%	36.50%	35.40%	33.10%	22.70%	9.20%	24.10%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	2	101 to 300	11.10%	14.30%	16.00%	37.80%	31.70%	19.80%	12.70%	13.20%	15.10%	16.70%	18.40%	19.00%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	2	301 to 500	11.10%	7.10%	16.00%	13.50%	15.90%	19.80%	13.80%	10.10%	7.80%	10.60%	18.40%	10.30%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	2	501 to 700 adjusted for max traps	27.80%	21.40%	16.00%	10.80%	15.90%	14.40%	21.50%	25.40%	26.50%	28.80%	24.10%	15.50%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	4.00%	0.00%	3.20%	0.90%	1.10%	1.10%	1.20%	0.80%	1.10%	10.30%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	101 to 300	11.10%	14.30%	12.00%	5.40%	9.50%	4.50%	1.70%	1.10%	2.40%	3.80%	6.90%	1.70%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	301 to 500	5.60%	7.10%	8.00%	5.40%	6.30%	6.30%	2.80%	3.70%	3.00%	3.80%	9.20%	5.20%
ME	19	Maine State Zone B Hancock County Trawl Limits & Swans Island Conservation Zone	3 to 4 adjusted for max tpt - 3	501 to 700 adjusted for max traps	33.30%	35.70%	24.00%	21.60%	12.70%	9.00%	9.90%	10.10%	10.80%	12.90%	12.60%	13.80%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	2	1 to 100	0.00%	0.00%	4.00%	5.40%	4.80%	25.20%	36.50%	35.40%	33.10%	22.70%	9.20%	24.10%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	2	101 to 300	11.10%	14.30%	16.00%	37.80%	31.70%	19.80%	12.70%	13.20%	15.10%	16.70%	18.40%	19.00%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	2	301 to 500	11.10%	7.10%	16.00%	13.50%	15.90%	19.80%	13.80%	10.10%	7.80%	10.60%	18.40%	10.30%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	2	501 to 700	16.70%	14.30%	12.00%	2.70%	7.90%	5.40%	10.50%	8.50%	9.00%	16.70%	17.20%	12.10%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	2	701+	11.10%	7.10%	4.00%	8.10%	7.90%	9.00%	11.00%	16.90%	17.50%	12.10%	6.90%	3.40%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	3 to 4	101 to 300	0.00%	0.00%	8.00%	0.00%	1.60%	0.00%	0.00%	0.00%	0.00%	2.30%	0.00%	0.00%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	3 to 4	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%	1.10%	1.70%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	3 to 4	501 to 700	11.10%	14.30%	8.00%	5.40%	1.60%	0.00%	0.60%	0.00%	0.00%	0.00%	2.30%	1.70%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	1.60%	0.90%	0.60%	0.50%	0.00%	2.30%	2.30%	3.40%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	5 to 9 adjusted for max tpt	1 to 100	0.00%	0.00%	4.00%	0.00%	3.20%	0.90%	1.10%	1.10%	1.20%	0.80%	1.10%	6.90%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	5 to 9 adjusted for max tpt	101 to 300	11.10%	14.30%	4.00%	5.40%	7.90%	4.50%	1.70%	1.10%	2.40%	1.50%	6.90%	1.70%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	5 to 9 adjusted for max tpt	301 to 500	5.60%	7.10%	8.00%	5.40%	6.30%	6.30%	2.20%	3.70%	3.00%	3.80%	8.00%	3.40%
ME	20	Maine State Zone B Waters Around Mount Desert Rock	5 to 9 adjusted for max tpt	501 to 700	11.10%	14.30%	12.00%	13.50%	7.90%	4.50%	4.40%	4.80%	5.40%	3.80%	2.30%	5.20%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	20	Maine State Zone B Waters Around Mount Desert Rock	5 to 9 adjusted for max tpt	701+	11.10%	7.10%	4.00%	2.70%	1.60%	3.60%	4.40%	4.80%	5.40%	6.80%	5.70%	3.40%
ME	21	Maine State Zone C	2	1 to 100	7.10%	4.50%	0.00%	10.00%	3.50%	12.70%	19.30%	20.70%	16.00%	9.60%	13.90%	13.40%
ME	21	Maine State Zone C	2	101 to 300	14.30%	13.60%	14.30%	10.00%	20.00%	15.20%	10.10%	9.90%	9.40%	11.90%	14.60%	19.40%
ME	21	Maine State Zone C	2	301 to 500	0.00%	4.50%	3.60%	12.00%	17.60%	16.50%	10.60%	8.60%	9.00%	11.90%	15.20%	9.00%
ME	21	Maine State Zone C	2	501 to 700	10.70%	0.00%	10.70%	6.00%	9.40%	17.70%	12.80%	10.80%	9.90%	10.70%	11.30%	6.00%
ME	21	Maine State Zone C	2	701+	3.60%	4.50%	3.60%	10.00%	11.80%	9.50%	17.90%	20.30%	21.70%	19.20%	8.60%	9.00%
ME	21	Maine State Zone C	3 to 4	1 to 100	0.00%	0.00%	0.00%	2.00%	0.00%	0.60%	0.90%	0.00%	0.50%	0.00%	0.00%	0.00%
ME	21	Maine State Zone C	3 to 4	101 to 300	7.10%	13.60%	7.10%	4.00%	1.20%	0.60%	1.40%	1.30%	0.90%	1.10%	1.30%	1.50%
ME	21	Maine State Zone C	3 to 4	301 to 500	0.00%	0.00%	0.00%	4.00%	2.40%	0.60%	0.50%	0.00%	0.90%	1.70%	0.70%	0.00%
ME	21	Maine State Zone C	3 to 4	501 to 700	0.00%	0.00%	0.00%	2.00%	0.00%	0.60%	0.00%	0.40%	0.00%	0.60%	0.70%	0.00%
ME	21	Maine State Zone C	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	1.20%	0.60%	0.90%	1.30%	2.80%	2.80%	0.70%	3.00%
ME	21	Maine State Zone C	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	2.80%	3.00%	2.80%	1.10%	2.00%	1.50%
ME	21	Maine State Zone C	5 to 9	101 to 300	3.60%	4.50%	3.60%	4.00%	5.90%	1.90%	2.30%	2.60%	2.40%	1.70%	2.60%	4.50%
ME	21	Maine State Zone C	5 to 9	301 to 500	0.00%	4.50%	7.10%	4.00%	1.20%	5.10%	1.80%	1.30%	0.90%	2.30%	1.30%	1.50%
ME	21	Maine State Zone C	5 to 9	501 to 700	3.60%	4.50%	0.00%	0.00%	0.00%	0.60%	3.20%	3.00%	4.20%	4.00%	3.30%	3.00%
ME	21	Maine State Zone C	5 to 9	701+	7.10%	9.10%	10.70%	6.00%	3.50%	1.90%	2.80%	2.60%	1.90%	2.80%	2.00%	4.50%
ME	21	Maine State Zone C	10 to 14	1 to 100	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	1.30%	4.50%
ME	21	Maine State Zone C	10 to 14	101 to 300	3.60%	4.50%	14.30%	6.00%	3.50%	1.30%	0.50%	0.40%	0.90%	1.70%	3.30%	3.00%
ME	21	Maine State Zone C	10 to 14	301 to 500	14.30%	18.20%	7.10%	8.00%	8.20%	3.80%	2.30%	1.30%	1.40%	2.30%	4.00%	6.00%
ME	21	Maine State Zone C	10 to 14	501 to 700	17.90%	9.10%	10.70%	8.00%	5.90%	3.20%	2.30%	2.20%	2.80%	3.40%	2.60%	6.00%
ME	21	Maine State Zone C	10 to 14	701+	3.60%	0.00%	0.00%	0.00%	4.70%	3.80%	6.40%	8.20%	9.00%	9.00%	7.30%	4.50%
ME	21	Maine State Zone C	15 to 19	101 to 300	3.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	0.00%
ME	21	Maine State Zone C	15 to 19	301 to 500	0.00%	4.50%	3.60%	0.00%	0.00%	0.60%	0.50%	0.90%	0.00%	0.60%	0.70%	0.00%
ME	21	Maine State Zone C	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	1.30%	0.00%	0.00%	0.50%	0.60%	0.70%	0.00%
ME	21	Maine State Zone C	15 to 19	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.90%	0.90%	0.50%	1.10%	0.70%	0.00%
ME	21	Maine State Zone C	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.40%	0.00%	0.00%	0.00%	0.00%
ME	21	Maine State Zone C	20 to 39	101 to 300	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%
ME	21	Maine State Zone C	20 to 39	301 to 500	0.00%	0.00%	3.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	2	1 to 100	7.10%	4.50%	0.00%	10.00%	3.50%	12.70%	19.30%	20.70%	16.00%	9.60%	13.90%	13.40%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	2	101 to 300	14.30%	13.60%	14.30%	10.00%	20.00%	15.20%	10.10%	9.90%	9.40%	11.90%	14.60%	19.40%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	2	301 to 500	0.00%	4.50%	3.60%	12.00%	17.60%	16.50%	10.60%	8.60%	9.00%	11.90%	15.20%	9.00%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	2	501 to 700	10.70%	0.00%	10.70%	6.00%	9.40%	17.70%	12.80%	10.80%	9.90%	10.70%	11.30%	6.00%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	2	701+	3.60%	4.50%	3.60%	10.00%	11.80%	9.50%	17.90%	20.30%	21.70%	19.20%	8.60%	9.00%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	0.00%	4.00%	0.00%	1.90%	3.70%	3.40%	3.80%	1.10%	3.30%	6.00%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	17.90%	22.70%	25.00%	16.00%	10.60%	3.80%	4.10%	4.30%	4.70%	4.50%	8.60%	9.00%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	14.30%	27.30%	21.40%	16.00%	11.80%	10.10%	5.00%	3.40%	3.80%	6.80%	6.60%	7.50%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	21.40%	13.60%	10.70%	10.00%	5.90%	5.70%	5.50%	5.60%	7.50%	8.50%	7.30%	9.00%
ME	22	Maine State Zone C Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	10.70%	9.10%	10.70%	6.00%	9.40%	7.00%	11.00%	12.90%	14.20%	15.80%	10.60%	11.90%
ME	23	Maine State Zone D Monhegan Conservation Zone	2	1 to 100	3.00%	0.00%	7.40%	14.60%	16.20%	23.10%	30.60%	30.00%	25.00%	21.80%	14.30%	14.10%
ME	23	Maine State Zone D Monhegan Conservation Zone	2	101 to 300	33.30%	33.30%	29.60%	29.30%	27.00%	19.90%	16.20%	13.80%	14.40%	14.60%	16.80%	21.70%
ME	23	Maine State Zone D Monhegan Conservation Zone	2	301 to 500 adjusted for max traps	36.40%	33.30%	33.30%	34.10%	35.10%	37.80%	37.60%	40.40%	44.00%	44.70%	45.30%	32.60%
ME	23	Maine State Zone D Monhegan Conservation Zone	3 to 4	1 to 100	0.00%	4.80%	0.00%	2.40%	1.40%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%
ME	23	Maine State Zone D Monhegan Conservation Zone	3 to 4	101 to 300	0.00%	0.00%	0.00%	2.40%	1.40%	0.60%	0.00%	0.00%	0.00%	0.50%	0.00%	4.30%
ME	23	Maine State Zone D Monhegan Conservation Zone	3 to 4	301 to 500 adjusted for max traps	9.10%	9.50%	3.70%	0.00%	1.40%	0.00%	0.90%	0.40%	1.40%	1.90%	2.50%	3.30%
ME	23	Maine State Zone D Monhegan Conservation Zone	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	1.30%	1.30%	0.50%	0.00%	0.00%	0.00%
ME	23	Maine State Zone D Monhegan Conservation Zone	5 to 9	101 to 300	0.00%	0.00%	0.00%	0.00%	1.40%	2.60%	0.40%	0.00%	0.00%	1.00%	0.60%	0.00%
ME	23	Maine State Zone D Monhegan Conservation Zone	5 to 9	301 to 500 adjusted for max traps	0.00%	4.80%	3.70%	0.00%	0.00%	1.90%	3.90%	3.30%	2.80%	3.40%	3.10%	3.30%
ME	23	Maine State Zone D Monhegan Conservation Zone	10 to 14	1 to 100	0.00%	0.00%	0.00%	2.40%	0.00%	0.60%	0.40%	0.80%	1.40%	0.50%	2.50%	1.10%
ME	23	Maine State Zone D Monhegan Conservation Zone	10 to 14	101 to 300	3.00%	0.00%	0.00%	0.00%	0.00%	1.30%	1.30%	1.30%	0.90%	1.90%	3.10%	7.60%
ME	23	Maine State Zone D Monhegan Conservation Zone	10 to 14	301 to 500 adjusted for max traps	9.10%	4.80%	7.40%	2.40%	4.10%	3.80%	3.90%	5.80%	5.60%	4.40%	5.60%	3.30%
ME	23	Maine State Zone D Monhegan Conservation Zone	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%
ME	23	Maine State Zone D Monhegan Conservation Zone	15 to 19	101 to 300	0.00%	0.00%	7.40%	2.40%	0.00%	0.60%	0.00%	0.40%	0.00%	0.00%	1.20%	0.00%
ME	23	Maine State Zone D Monhegan Conservation Zone	15 to 19	301 to 500 adjusted for max traps	6.10%	9.50%	7.40%	7.30%	5.40%	1.30%	2.60%	0.80%	2.30%	4.40%	1.90%	2.20%
ME	23	Maine State Zone D Monhegan Conservation Zone	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	1.40%	0.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	23	Maine State Zone D Monhegan Conservation Zone	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	1.40%	0.60%	0.40%	0.00%	0.50%	0.50%	0.00%	2.20%
ME	23	Maine State Zone D Monhegan Conservation Zone	20 to 39	301 to 500 adjusted for max traps	0.00%	0.00%	0.00%	2.40%	4.10%	3.80%	0.40%	1.70%	1.40%	0.50%	3.10%	0.00%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	2	1 to 100	3.00%	0.00%	7.40%	14.60%	16.20%	23.10%	30.60%	30.00%	25.00%	21.80%	14.30%	14.10%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	2	101 to 300	33.30%	33.30%	29.60%	29.30%	27.00%	19.90%	16.20%	13.80%	14.40%	14.60%	16.80%	21.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	2	301 to 500	15.20%	19.00%	18.50%	24.40%	17.60%	15.40%	8.30%	8.80%	7.40%	11.20%	16.80%	14.10%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	2	501 to 700	15.20%	9.50%	11.10%	4.90%	12.20%	12.20%	12.20%	12.50%	15.30%	14.10%	14.30%	12.00%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	2	701+	6.10%	4.80%	3.70%	4.90%	5.40%	10.30%	17.00%	19.20%	21.30%	19.40%	14.30%	6.50%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	4.80%	0.00%	4.90%	2.70%	2.60%	1.70%	2.10%	1.90%	0.50%	2.50%	5.40%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	3.00%	0.00%	7.40%	4.90%	4.10%	5.80%	2.20%	1.70%	1.40%	3.90%	5.00%	14.10%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	15.20%	14.30%	7.40%	4.90%	6.80%	3.20%	3.10%	3.80%	4.20%	4.40%	8.70%	4.30%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	0.00%	4.80%	3.70%	2.40%	4.10%	3.80%	5.20%	3.30%	2.80%	2.90%	5.00%	2.20%
ME	24	Maine State Zone D Pemaquid to Robinson's Pt. Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	9.10%	9.50%	11.10%	4.90%	4.10%	3.80%	3.50%	5.00%	6.50%	7.30%	2.50%	5.40%
ME	25	Maine State Zone E Zone E Trap Limits	2	1 to 100	17.60%	18.20%	27.30%	41.20%	40.50%	41.90%	39.70%	39.00%	37.50%	27.50%	12.10%	16.30%
ME	25	Maine State Zone E Zone E Trap Limits	2	101 to 300	23.50%	18.20%	18.20%	29.40%	35.10%	24.70%	21.60%	22.90%	19.20%	26.40%	33.30%	27.90%
ME	25	Maine State Zone E Zone E Trap Limits	2	301 to 500	11.80%	18.20%	18.20%	5.90%	8.10%	14.00%	9.50%	10.20%	12.50%	11.00%	15.20%	20.90%
ME	25	Maine State Zone E Zone E Trap Limits	2	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	4.30%	14.70%	14.40%	16.30%	18.70%	16.70%	7.00%
ME	25	Maine State Zone E Zone E Trap Limits	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	2.20%	1.50%	0.00%
ME	25	Maine State Zone E Zone E Trap Limits	3 to 4	101 to 300	0.00%	0.00%	0.00%	0.00%	2.70%	1.10%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%
ME	25	Maine State Zone E Zone E Trap Limits	3 to 4	301 to 500	0.00%	9.10%	0.00%	0.00%	2.70%	1.10%	1.70%	0.80%	0.00%	0.00%	1.50%	4.70%
ME	25	Maine State Zone E Zone E Trap Limits	3 to 4	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	2.60%	2.50%	1.90%	3.30%	1.50%	2.30%
ME	25	Maine State Zone E Zone E Trap Limits	5 to 9	1 to 100	5.90%	0.00%	0.00%	0.00%	0.00%	1.10%	1.70%	0.80%	0.00%	1.10%	0.00%	0.00%
ME	25	Maine State Zone E Zone E Trap Limits	5 to 9	101 to 300	17.60%	18.20%	18.20%	5.90%	2.70%	2.20%	0.00%	0.80%	1.90%	1.10%	1.50%	7.00%
ME	25	Maine State Zone E Zone E Trap Limits	5 to 9	301 to 500	11.80%	0.00%	18.20%	11.80%	5.40%	5.40%	2.60%	0.80%	0.00%	0.00%	3.00%	2.30%
ME	25	Maine State Zone E Zone E Trap Limits	5 to 9	501 to 700 adjusted for max traps	5.90%	9.10%	0.00%	5.90%	2.70%	3.20%	6.00%	7.60%	7.70%	7.70%	10.60%	11.60%
ME	25	Maine State Zone E Zone E Trap Limits	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%
ME	25	Maine State Zone E Zone E Trap Limits	10 to 14	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.10%	0.00%	0.00%
ME	25	Maine State Zone E Zone E Trap Limits	20 to 39	501 to 700 adjusted for max traps	5.90%	9.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	26	Maine State Zone F	2	1 to 100	4.80%	0.00%	5.90%	18.50%	22.90%	40.10%	42.90%	39.30%	35.00%	24.10%	12.70%	5.60%
ME	26	Maine State Zone F	2	101 to 300	28.60%	36.40%	29.40%	14.80%	12.50%	10.90%	11.20%	12.10%	13.60%	12.80%	11.80%	13.00%
ME	26	Maine State Zone F	2	301 to 500	0.00%	0.00%	0.00%	3.70%	4.20%	3.60%	3.90%	4.90%	5.60%	7.80%	6.90%	3.70%
ME	26	Maine State Zone F	2	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	0.50%	0.00%	0.00%	1.00%	0.00%
ME	26	Maine State Zone F	2	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.90%	2.30%	2.80%	2.00%	0.00%
ME	26	Maine State Zone F	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	2.10%	2.20%	0.50%	0.50%	0.00%	1.40%	0.00%	1.90%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	26	Maine State Zone F	3 to 4	101 to 300	4.80%	0.00%	0.00%	3.70%	4.20%	2.20%	1.00%	1.00%	1.70%	1.40%	3.90%	0.00%
ME	26	Maine State Zone F	3 to 4	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.50%	1.00%	1.10%	1.40%	1.00%	0.00%
ME	26	Maine State Zone F	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	1.50%	0.50%	1.10%	0.70%	1.00%	0.00%
ME	26	Maine State Zone F	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	0.00%
ME	26	Maine State Zone F	5 to 9	1 to 100	9.50%	18.20%	5.90%	3.70%	0.00%	0.00%	1.00%	1.50%	1.10%	0.70%	2.00%	5.60%
ME	26	Maine State Zone F	5 to 9	101 to 300	9.50%	9.10%	17.60%	11.10%	20.80%	5.80%	1.50%	1.90%	1.70%	2.80%	5.90%	7.40%
ME	26	Maine State Zone F	5 to 9	301 to 500	9.50%	0.00%	11.80%	7.40%	2.10%	9.50%	3.90%	3.40%	2.80%	2.80%	9.80%	14.80%
ME	26	Maine State Zone F	5 to 9	501 to 700	4.80%	0.00%	5.90%	3.70%	8.30%	7.30%	7.30%	6.30%	5.10%	6.40%	6.90%	9.30%
ME	26	Maine State Zone F	5 to 9	701+	9.50%	18.20%	0.00%	3.70%	4.20%	7.30%	12.70%	17.00%	18.10%	22.00%	20.60%	11.10%
ME	26	Maine State Zone F	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	1.00%	1.90%
ME	26	Maine State Zone F	10 to 14	101 to 300	0.00%	0.00%	0.00%	7.40%	2.10%	2.20%	0.00%	0.00%	0.60%	0.70%	2.00%	9.30%
ME	26	Maine State Zone F	10 to 14	301 to 500	0.00%	0.00%	0.00%	3.70%	6.30%	2.90%	1.50%	1.50%	1.70%	3.50%	3.90%	1.90%
ME	26	Maine State Zone F	10 to 14	501 to 700	4.80%	18.20%	0.00%	0.00%	2.10%	0.70%	2.90%	1.50%	2.80%	4.30%	2.90%	0.00%
ME	26	Maine State Zone F	10 to 14	701+	9.50%	0.00%	5.90%	3.70%	2.10%	2.20%	3.40%	2.90%	3.40%	3.50%	3.90%	7.40%
ME	26	Maine State Zone F	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%
ME	26	Maine State Zone F	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	2.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	26	Maine State Zone F	15 to 19	501 to 700	0.00%	0.00%	5.90%	3.70%	0.00%	0.00%	0.00%	0.50%	0.00%	0.00%	0.00%	0.00%
ME	26	Maine State Zone F	15 to 19	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.50%	0.60%	0.00%	0.00%	0.00%
ME	26	Maine State Zone F	20 to 39	1 to 100	4.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.60%	0.00%	0.00%	1.90%
ME	26	Maine State Zone F	20 to 39	101 to 300	0.00%	0.00%	5.90%	7.40%	2.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	26	Maine State Zone F	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	1.00%	1.90%
ME	26	Maine State Zone F	20 to 39	701+	0.00%	0.00%	5.90%	3.70%	2.10%	0.00%	0.50%	0.50%	0.60%	0.70%	0.00%	3.70%
ME	27	Maine State Zone G	2	1 to 100	6.70%	7.70%	13.30%	22.20%	32.60%	43.20%	50.90%	50.50%	49.50%	44.00%	17.40%	9.40%
ME	27	Maine State Zone G	2	101 to 300	20.00%	23.10%	40.00%	37.00%	15.20%	17.60%	11.30%	11.70%	11.30%	6.70%	10.90%	21.90%
ME	27	Maine State Zone G	2	301 to 500	6.70%	0.00%	0.00%	11.10%	19.60%	8.10%	4.70%	3.60%	4.10%	8.00%	13.00%	9.40%
ME	27	Maine State Zone G	2	501 to 700	6.70%	0.00%	6.70%	3.70%	2.20%	4.10%	8.50%	5.40%	9.30%	8.00%	8.70%	9.40%
ME	27	Maine State Zone G	2	701+	6.70%	15.40%	0.00%	7.40%	6.50%	8.10%	5.70%	7.20%	6.20%	9.30%	4.30%	0.00%
ME	27	Maine State Zone G	3 to 4	1 to 100	13.30%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.90%	1.00%	1.30%	2.20%	3.10%
ME	27	Maine State Zone G	3 to 4	101 to 300	6.70%	15.40%	13.30%	0.00%	2.20%	1.40%	1.90%	1.80%	3.10%	4.00%	6.50%	6.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	27	Maine State Zone G	3 to 4	301 to 500	13.30%	7.70%	13.30%	0.00%	6.50%	1.40%	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%
ME	27	Maine State Zone G	3 to 4	501 to 700	0.00%	7.70%	0.00%	0.00%	2.20%	1.40%	0.00%	2.70%	2.10%	1.30%	2.20%	0.00%
ME	27	Maine State Zone G	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	4.70%	1.80%	2.10%	1.30%	2.20%	3.10%
ME	27	Maine State Zone G	5 to 9	1 to 100	0.00%	0.00%	0.00%	3.70%	2.20%	0.00%	0.90%	1.80%	0.00%	0.00%	2.20%	6.30%
ME	27	Maine State Zone G	5 to 9	101 to 300	6.70%	7.70%	6.70%	3.70%	0.00%	4.10%	0.90%	0.90%	0.00%	1.30%	4.30%	0.00%
ME	27	Maine State Zone G	5 to 9	301 to 500	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%
ME	27	Maine State Zone G	5 to 9	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	0.00%	0.90%	0.00%	1.30%	0.00%	0.00%
ME	27	Maine State Zone G	5 to 9	701+	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	2.80%	5.40%	5.20%	5.30%	8.70%	3.10%
ME	27	Maine State Zone G	10 to 14	1 to 100	0.00%	0.00%	0.00%	3.70%	2.20%	0.00%	0.00%	0.00%	1.00%	0.00%	4.30%	3.10%
ME	27	Maine State Zone G	10 to 14	101 to 300	0.00%	0.00%	0.00%	3.70%	2.20%	1.40%	2.80%	1.80%	1.00%	1.30%	0.00%	0.00%
ME	27	Maine State Zone G	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	2.20%	2.70%	2.80%	0.90%	2.10%	4.00%	4.30%	6.30%
ME	27	Maine State Zone G	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	1.00%	0.00%	0.00%	3.10%
ME	27	Maine State Zone G	10 to 14	701+	0.00%	0.00%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	1.00%	1.30%	2.20%	6.30%
ME	27	Maine State Zone G	15 to 19	101 to 300	0.00%	7.70%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	27	Maine State Zone G	15 to 19	701+	0.00%	0.00%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	27	Maine State Zone G	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	0.00%	0.90%	0.00%	1.30%	2.20%	0.00%
ME	27	Maine State Zone G	20 to 39	701+	6.70%	7.70%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%
ME	28	Maine State Zone G Southern Maine Trawl Limits	2	1 to 100	6.70%	7.70%	13.30%	22.20%	32.60%	43.20%	50.90%	50.50%	49.50%	44.00%	17.40%	9.40%
ME	28	Maine State Zone G Southern Maine Trawl Limits	2	101 to 300	20.00%	23.10%	40.00%	37.00%	15.20%	17.60%	11.30%	11.70%	11.30%	6.70%	10.90%	21.90%
ME	28	Maine State Zone G Southern Maine Trawl Limits	2	301 to 500	6.70%	0.00%	0.00%	11.10%	19.60%	8.10%	4.70%	3.60%	4.10%	8.00%	13.00%	9.40%
ME	28	Maine State Zone G Southern Maine Trawl Limits	2	501 to 700	6.70%	0.00%	6.70%	3.70%	2.20%	4.10%	8.50%	5.40%	9.30%	8.00%	8.70%	9.40%
ME	28	Maine State Zone G Southern Maine Trawl Limits	2	701+	6.70%	15.40%	0.00%	7.40%	6.50%	8.10%	5.70%	7.20%	6.20%	9.30%	4.30%	0.00%
ME	28	Maine State Zone G Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	1 to 100	13.30%	0.00%	0.00%	7.40%	4.30%	0.00%	2.80%	2.70%	2.10%	1.30%	8.70%	12.50%
ME	28	Maine State Zone G Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	101 to 300	13.30%	30.80%	20.00%	7.40%	6.50%	8.10%	5.70%	5.40%	4.10%	8.00%	13.00%	6.30%
ME	28	Maine State Zone G Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	301 to 500	20.00%	7.70%	13.30%	0.00%	8.70%	4.10%	2.80%	0.90%	2.10%	4.00%	8.70%	12.50%
ME	28	Maine State Zone G Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	501 to 700	0.00%	7.70%	0.00%	0.00%	2.20%	2.70%	0.00%	5.40%	3.10%	2.70%	2.20%	3.10%
ME	28	Maine State Zone G Southern Maine Trawl Limits	3 to 4 adjusted for max tpt - 3	701+	6.70%	7.70%	6.70%	3.70%	2.20%	4.10%	7.50%	7.20%	8.20%	8.00%	13.00%	15.60%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	2	1 to 100	6.70%	7.70%	13.30%	22.20%	32.60%	43.20%	50.90%	50.50%	49.50%	44.00%	17.40%	9.40%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	2	101 to 300	20.00%	23.10%	40.00%	37.00%	15.20%	17.60%	11.30%	11.70%	11.30%	6.70%	10.90%	21.90%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	2	301 to 500	6.70%	0.00%	0.00%	11.10%	19.60%	8.10%	4.70%	3.60%	4.10%	8.00%	13.00%	9.40%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	2	501 to 700	6.70%	0.00%	6.70%	3.70%	2.20%	4.10%	8.50%	5.40%	9.30%	8.00%	8.70%	9.40%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	2	701+	6.70%	15.40%	0.00%	7.40%	6.50%	8.10%	5.70%	7.20%	6.20%	9.30%	4.30%	0.00%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	3 to 4	1 to 100	13.30%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.90%	1.00%	1.30%	2.20%	3.10%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	3 to 4	101 to 300	6.70%	15.40%	13.30%	0.00%	2.20%	1.40%	1.90%	1.80%	3.10%	4.00%	6.50%	6.30%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	3 to 4	301 to 500	13.30%	7.70%	13.30%	0.00%	6.50%	1.40%	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	3 to 4	501 to 700	0.00%	7.70%	0.00%	0.00%	2.20%	1.40%	0.00%	2.70%	2.10%	1.30%	2.20%	0.00%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	4.70%	1.80%	2.10%	1.30%	2.20%	3.10%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	5 to 9	1 to 100	0.00%	0.00%	0.00%	3.70%	2.20%	0.00%	0.90%	1.80%	0.00%	0.00%	2.20%	6.30%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	5 to 9	101 to 300	6.70%	7.70%	6.70%	3.70%	0.00%	4.10%	0.90%	0.90%	0.00%	1.30%	4.30%	0.00%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	5 to 9	301 to 500	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	5 to 9	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	0.00%	0.90%	0.00%	1.30%	0.00%	0.00%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	5 to 9	701+	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	2.80%	5.40%	5.20%	5.30%	8.70%	3.10%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	10 to 15 adjusted for max tpt - 10	1 to 100	0.00%	0.00%	0.00%	3.70%	2.20%	0.00%	0.00%	0.00%	1.00%	0.00%	4.30%	3.10%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	10 to 15 adjusted for max tpt - 10	101 to 300	0.00%	7.70%	0.00%	3.70%	4.30%	2.70%	2.80%	2.70%	1.00%	2.70%	2.20%	0.00%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	10 to 15 adjusted for max tpt - 10	301 to 500	0.00%	0.00%	0.00%	0.00%	2.20%	2.70%	2.80%	0.90%	2.10%	4.00%	4.30%	6.30%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	10 to 15 adjusted for max tpt - 10	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	1.00%	0.00%	0.00%	3.10%
ME	29	Maine State Zone G Waters off Kittery Trawl Limits	10 to 15 adjusted for max tpt - 10	701+	6.70%	7.70%	6.70%	3.70%	2.20%	0.00%	0.00%	0.00%	1.00%	1.30%	2.20%	9.40%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	1	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	5.40%	2.30%	2.20%	2.00%	0.00%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	1	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	0.00%	0.00%	2.10%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	1	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.10%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	1	701+	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	4.50%	4.40%	4.00%	2.10%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	2	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.20%	0.00%	0.00%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	2	101 to 300	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%	0.00%	0.00%	2.10%	2.30%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	2	301 to 500	8.30%	0.00%	7.10%	4.50%	3.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	2	501 to 700	8.30%	14.30%	7.10%	9.10%	3.00%	2.70%	2.30%	2.20%	2.00%	6.30%	4.70%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	2	701+	0.00%	0.00%	0.00%	0.00%	6.10%	2.70%	11.40%	13.30%	10.00%	8.30%	7.00%	6.50%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	3 to 4	101 to 300	0.00%	0.00%	7.10%	4.50%	3.00%	0.00%	2.30%	0.00%	0.00%	0.00%	0.00%	3.20%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	3 to 4	301 to 500	0.00%	0.00%	7.10%	0.00%	9.10%	0.00%	0.00%	2.20%	0.00%	2.10%	7.00%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	2.20%	0.00%	0.00%	4.70%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	8.10%	6.80%	6.70%	6.00%	4.20%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	5 to 9	101 to 300	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.80%	0.00%	4.00%	2.10%	2.30%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	5 to 9	501 to 700	0.00%	0.00%	0.00%	4.50%	3.00%	2.70%	0.00%	2.20%	2.00%	0.00%	4.70%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	5 to 9	701+	0.00%	0.00%	0.00%	9.10%	6.10%	5.40%	9.10%	2.20%	2.00%	4.20%	2.30%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.10%	2.30%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	10 to 14	101 to 300	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	3.00%	5.40%	0.00%	4.40%	0.00%	4.20%	2.30%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	3.00%	2.70%	2.30%	4.40%	4.00%	2.10%	0.00%	9.70%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	10 to 14	701+	0.00%	14.30%	7.10%	4.50%	6.10%	8.10%	0.00%	4.40%	2.00%	4.20%	4.70%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	15 to 19	101 to 300	8.30%	0.00%	7.10%	4.50%	3.00%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	15 to 19	301 to 500	16.70%	28.60%	14.30%	13.60%	9.10%	2.70%	0.00%	0.00%	2.00%	2.10%	0.00%	3.20%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	9.10%	5.40%	0.00%	2.20%	0.00%	0.00%	2.30%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	15 to 19	701+	0.00%	0.00%	7.10%	0.00%	3.00%	5.40%	9.10%	17.80%	14.00%	10.40%	20.90%	6.50%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	2.30%	2.20%	2.00%	2.10%	2.30%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	20 to 39	101 to 300	8.30%	14.30%	7.10%	4.50%	3.00%	5.40%	2.30%	0.00%	2.00%	0.00%	0.00%	6.50%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	20 to 39	301 to 500	25.00%	0.00%	14.30%	22.70%	9.10%	0.00%	9.10%	2.20%	4.00%	4.20%	2.30%	0.00%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	20 to 39	501 to 700	8.30%	14.30%	7.10%	4.50%	6.10%	8.10%	2.30%	2.20%	4.00%	4.20%	4.70%	9.70%
ME	30	Maine Nearshore Zone A 3-6 Miles Exempt	20 to 39	701+	16.70%	14.30%	7.10%	4.50%	9.10%	18.90%	25.00%	20.00%	30.00%	29.20%	18.60%	22.60%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	1	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	10.50%	5.90%	6.30%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	1	101 to 300	0.00%	0.00%	0.00%	6.70%	6.30%	10.50%	11.80%	6.30%	6.30%	10.50%	5.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	1	301 to 500	0.00%	0.00%	0.00%	6.70%	0.00%	5.30%	5.90%	6.30%	12.50%	5.30%	5.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	1	701+	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	5.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	2	1 to 100	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	2	101 to 300	7.70%	0.00%	9.10%	6.70%	6.30%	0.00%	0.00%	6.30%	6.30%	5.30%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	2	301 to 500	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	5.90%	6.30%	0.00%	0.00%	10.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	2	501 to 700	0.00%	0.00%	9.10%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	5.00%	11.80%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	2	701+	15.40%	25.00%	27.30%	13.30%	12.50%	15.80%	17.60%	18.80%	12.50%	10.50%	10.00%	11.80%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	3 to 4	101 to 300	7.70%	0.00%	0.00%	6.70%	6.30%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	3 to 4	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	3 to 4	701+	0.00%	0.00%	9.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	5.90%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	5 to 9	501 to 700	7.70%	12.50%	9.10%	13.30%	0.00%	0.00%	0.00%	6.30%	0.00%	5.30%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	5 to 9	701+	7.70%	12.50%	0.00%	6.70%	6.30%	5.30%	5.90%	6.30%	12.50%	10.50%	5.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	11.80%	6.30%	6.30%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	10 to 14	101 to 300	0.00%	0.00%	0.00%	0.00%	6.30%	10.50%	0.00%	6.30%	0.00%	10.50%	10.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	10 to 14	301 to 500	0.00%	0.00%	0.00%	6.70%	6.30%	5.30%	5.90%	6.30%	12.50%	5.30%	5.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	10 to 14	501 to 700	0.00%	12.50%	0.00%	0.00%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	5.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	10 to 14	701+	7.70%	0.00%	0.00%	0.00%	6.30%	0.00%	11.80%	6.30%	6.30%	10.50%	5.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	15 to 19	101 to 300	0.00%	0.00%	9.10%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	15 to 19	301 to 500	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	15 to 19	701+	7.70%	12.50%	9.10%	13.30%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	10.00%	5.90%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	20 to 39	101 to 300	0.00%	0.00%	0.00%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	5.90%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	31	Maine Nearshore Zone G 3-6 Miles Exempt	20 to 39	701+	15.40%	25.00%	18.20%	6.70%	6.30%	5.30%	5.90%	12.50%	12.50%	10.50%	10.00%	17.60%
ME	32	Maine Nearshore Zone A 3-6 Miles	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	5.40%	2.30%	4.40%	2.00%	0.00%	0.00%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	3 to 4	101 to 300	0.00%	0.00%	7.10%	4.50%	6.10%	0.00%	4.50%	0.00%	0.00%	4.20%	2.30%	6.50%
ME	32	Maine Nearshore Zone A 3-6 Miles	3 to 4	301 to 500	8.30%	0.00%	14.30%	4.50%	12.10%	0.00%	0.00%	2.20%	2.00%	2.10%	7.00%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	3 to 4	501 to 700	8.30%	14.30%	7.10%	9.10%	3.00%	5.40%	2.30%	4.40%	2.00%	8.30%	9.30%	0.00%
ME	32	Maine Nearshore Zone A 3-6 Miles	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	6.10%	13.50%	22.70%	24.40%	20.00%	14.60%	7.00%	6.50%
ME	32	Maine Nearshore Zone A 3-6 Miles	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%
ME	32	Maine Nearshore Zone A 3-6 Miles	5 to 9	101 to 300	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	32	Maine Nearshore Zone A 3-6 Miles	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.80%	0.00%	4.00%	2.10%	2.30%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	5 to 9	501 to 700	0.00%	0.00%	0.00%	4.50%	3.00%	2.70%	0.00%	2.20%	2.00%	0.00%	4.70%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	5 to 9	701+	0.00%	0.00%	0.00%	9.10%	6.10%	5.40%	9.10%	2.20%	2.00%	4.20%	2.30%	0.00%
ME	32	Maine Nearshore Zone A 3-6 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.10%	2.30%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	10 to 14	101 to 300	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	3.00%	5.40%	0.00%	4.40%	0.00%	4.20%	2.30%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	3.00%	2.70%	2.30%	4.40%	4.00%	2.10%	0.00%	9.70%
ME	32	Maine Nearshore Zone A 3-6 Miles	10 to 14	701+	0.00%	14.30%	7.10%	4.50%	6.10%	8.10%	0.00%	4.40%	2.00%	4.20%	4.70%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	15 to 19	101 to 300	8.30%	0.00%	7.10%	4.50%	3.00%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	15 to 19	301 to 500	16.70%	28.60%	14.30%	13.60%	9.10%	2.70%	0.00%	0.00%	2.00%	2.10%	0.00%	3.20%
ME	32	Maine Nearshore Zone A 3-6 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	9.10%	5.40%	0.00%	2.20%	0.00%	0.00%	2.30%	0.00%
ME	32	Maine Nearshore Zone A 3-6 Miles	15 to 19	701+	0.00%	0.00%	7.10%	0.00%	3.00%	5.40%	9.10%	17.80%	14.00%	10.40%	20.90%	6.50%
ME	32	Maine Nearshore Zone A 3-6 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	2.30%	2.20%	2.00%	2.10%	2.30%	0.00%
ME	32	Maine Nearshore Zone A 3-6 Miles	20 to 39	101 to 300	8.30%	14.30%	7.10%	4.50%	3.00%	5.40%	2.30%	0.00%	2.00%	0.00%	0.00%	6.50%
ME	32	Maine Nearshore Zone A 3-6 Miles	20 to 39	301 to 500	25.00%	0.00%	14.30%	22.70%	9.10%	0.00%	9.10%	2.20%	4.00%	4.20%	2.30%	0.00%
ME	32	Maine Nearshore Zone A 3-6 Miles	20 to 39	501 to 700	8.30%	14.30%	7.10%	4.50%	6.10%	8.10%	2.30%	2.20%	4.00%	4.20%	4.70%	9.70%
ME	32	Maine Nearshore Zone A 3-6 Miles	20 to 39	701+	16.70%	14.30%	7.10%	4.50%	9.10%	18.90%	25.00%	20.00%	30.00%	29.20%	18.60%	22.60%
ME	33	Maine Nearshore Zone A 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	8.10%	4.50%	6.70%	6.00%	4.20%	4.70%	6.50%
ME	33	Maine Nearshore Zone A 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	101 to 300	16.70%	14.30%	21.40%	22.70%	12.10%	8.10%	6.80%	0.00%	2.00%	4.20%	7.00%	19.40%
ME	33	Maine Nearshore Zone A 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	301 to 500	50.00%	28.60%	42.90%	40.90%	33.30%	8.10%	15.90%	8.90%	12.00%	14.60%	14.00%	12.90%
ME	33	Maine Nearshore Zone A 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	501 to 700	16.70%	28.60%	14.30%	18.20%	24.20%	24.30%	6.80%	15.60%	12.00%	14.60%	20.90%	22.60%
ME	33	Maine Nearshore Zone A 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	701+	16.70%	28.60%	21.40%	18.20%	30.30%	51.40%	65.90%	68.90%	68.00%	62.50%	53.50%	38.70%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	2	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	5.40%	2.30%	4.40%	2.00%	0.00%	0.00%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	2	101 to 300	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%	2.30%	0.00%	0.00%	4.20%	2.30%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	2	301 to 500	8.30%	0.00%	7.10%	4.50%	3.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	2	501 to 700	8.30%	14.30%	7.10%	9.10%	3.00%	2.70%	2.30%	2.20%	2.00%	8.30%	4.70%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	2	701+	0.00%	0.00%	0.00%	0.00%	6.10%	5.40%	15.90%	17.80%	14.00%	10.40%	7.00%	6.50%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	3 to 4	101 to 300	0.00%	0.00%	7.10%	4.50%	3.00%	0.00%	2.30%	0.00%	0.00%	0.00%	0.00%	3.20%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	3 to 4	301 to 500	0.00%	0.00%	7.10%	0.00%	9.10%	0.00%	0.00%	2.20%	0.00%	2.10%	7.00%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	2.20%	0.00%	0.00%	4.70%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	8.10%	6.80%	6.70%	6.00%	4.20%	0.00%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	5 to 9	101 to 300	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.80%	0.00%	4.00%	2.10%	2.30%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	5 to 9	501 to 700	0.00%	0.00%	0.00%	4.50%	3.00%	2.70%	0.00%	2.20%	2.00%	0.00%	4.70%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	5 to 9	701+	0.00%	0.00%	0.00%	9.10%	6.10%	5.40%	9.10%	2.20%	2.00%	4.20%	2.30%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.10%	2.30%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	10 to 14	101 to 300	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	3.00%	5.40%	0.00%	4.40%	0.00%	4.20%	2.30%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	3.00%	2.70%	2.30%	4.40%	4.00%	2.10%	0.00%	9.70%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	10 to 14	701+	0.00%	14.30%	7.10%	4.50%	6.10%	8.10%	0.00%	4.40%	2.00%	4.20%	4.70%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	15 to 19	101 to 300	8.30%	0.00%	7.10%	4.50%	3.00%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	15 to 19	301 to 500	16.70%	28.60%	14.30%	13.60%	9.10%	2.70%	0.00%	0.00%	2.00%	2.10%	0.00%	3.20%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	9.10%	5.40%	0.00%	2.20%	0.00%	0.00%	2.30%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	15 to 19	701+	0.00%	0.00%	7.10%	0.00%	3.00%	5.40%	9.10%	17.80%	14.00%	10.40%	20.90%	6.50%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	2.30%	2.20%	2.00%	2.10%	2.30%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	20 to 39	101 to 300	8.30%	14.30%	7.10%	4.50%	3.00%	5.40%	2.30%	0.00%	2.00%	0.00%	0.00%	6.50%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	20 to 39	301 to 500	25.00%	0.00%	14.30%	22.70%	9.10%	0.00%	9.10%	2.20%	4.00%	4.20%	2.30%	0.00%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	20 to 39	501 to 700	8.30%	14.30%	7.10%	4.50%	6.10%	8.10%	2.30%	2.20%	4.00%	4.20%	4.70%	9.70%
ME	34	Maine Nearshore Zone A 3-6 Miles Pocket	20 to 39	701+	16.70%	14.30%	7.10%	4.50%	9.10%	18.90%	25.00%	20.00%	30.00%	29.20%	18.60%	22.60%
ME	35	Maine Nearshore Zone B 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	10.50%	9.50%	0.00%	4.30%	0.00%	0.00%	0.00%
ME	35	Maine Nearshore Zone B 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	101 to 300	26.70%	0.00%	16.70%	13.30%	40.00%	21.10%	14.30%	16.70%	8.70%	14.80%	14.80%	19.00%
ME	35	Maine Nearshore Zone B 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	301 to 500	40.00%	60.00%	33.30%	40.00%	13.30%	15.80%	14.30%	11.10%	17.40%	22.20%	22.20%	38.10%
ME	35	Maine Nearshore Zone B 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	501 to 700	13.30%	40.00%	16.70%	20.00%	33.30%	31.60%	28.60%	11.10%	17.40%	18.50%	40.70%	14.30%
ME	35	Maine Nearshore Zone B 3-6 Miles (Hancock County Trawl Limits)	3 to 4 adjusted for max tpt - 3	701+	20.00%	0.00%	33.30%	26.70%	13.30%	21.10%	33.30%	61.10%	52.20%	44.40%	22.20%	28.60%
ME	36	Maine Nearshore Zone C 3-6 Miles	3 to 4	1 to 100	0.00%	0.00%	8.30%	0.00%	4.30%	0.00%	8.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	3 to 4	101 to 300	5.30%	0.00%	8.30%	11.80%	8.70%	7.10%	4.00%	4.50%	0.00%	0.00%	0.00%	7.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	36	Maine Nearshore Zone C 3-6 Miles	3 to 4	301 to 500	5.30%	15.40%	0.00%	5.90%	0.00%	14.30%	4.00%	0.00%	4.50%	3.60%	10.00%	3.80%
ME	36	Maine Nearshore Zone C 3-6 Miles	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	13.00%	14.30%	4.00%	4.50%	9.10%	3.60%	6.70%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	3 to 4	701+	5.30%	0.00%	0.00%	17.60%	4.30%	10.70%	20.00%	22.70%	22.70%	25.00%	13.30%	7.70%
ME	36	Maine Nearshore Zone C 3-6 Miles	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	5 to 9	101 to 300	5.30%	7.70%	0.00%	0.00%	8.70%	3.60%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	5 to 9	301 to 500	5.30%	0.00%	0.00%	0.00%	8.70%	0.00%	4.00%	0.00%	0.00%	3.60%	0.00%	3.80%
ME	36	Maine Nearshore Zone C 3-6 Miles	5 to 9	501 to 700	15.80%	7.70%	8.30%	5.90%	4.30%	3.60%	0.00%	0.00%	0.00%	3.60%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	5 to 9	701+	5.30%	0.00%	0.00%	5.90%	0.00%	0.00%	8.00%	0.00%	4.50%	0.00%	3.30%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	10 to 14	101 to 300	5.30%	0.00%	0.00%	5.90%	4.30%	14.30%	8.00%	9.10%	9.10%	3.60%	3.30%	3.80%
ME	36	Maine Nearshore Zone C 3-6 Miles	10 to 14	301 to 500	5.30%	0.00%	16.70%	5.90%	8.70%	7.10%	4.00%	4.50%	9.10%	14.30%	10.00%	11.50%
ME	36	Maine Nearshore Zone C 3-6 Miles	10 to 14	501 to 700	5.30%	38.50%	16.70%	5.90%	8.70%	3.60%	8.00%	0.00%	0.00%	7.10%	0.00%	11.50%
ME	36	Maine Nearshore Zone C 3-6 Miles	10 to 14	701+	10.50%	15.40%	16.70%	11.80%	4.30%	17.90%	16.00%	31.80%	27.30%	21.40%	36.70%	30.80%
ME	36	Maine Nearshore Zone C 3-6 Miles	15 to 19	1 to 100	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	15 to 19	101 to 300	5.30%	0.00%	0.00%	5.90%	4.30%	0.00%	4.00%	4.50%	0.00%	0.00%	3.30%	7.70%
ME	36	Maine Nearshore Zone C 3-6 Miles	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	7.10%	3.30%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	15 to 19	501 to 700	5.30%	0.00%	0.00%	5.90%	8.70%	3.60%	0.00%	0.00%	0.00%	0.00%	3.30%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	15 to 19	701+	10.50%	7.70%	16.70%	11.80%	4.30%	0.00%	4.00%	0.00%	4.50%	7.10%	6.70%	11.50%
ME	36	Maine Nearshore Zone C 3-6 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	20 to 39	101 to 300	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	36	Maine Nearshore Zone C 3-6 Miles	20 to 39	701+	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	2	1 to 100	0.00%	0.00%	8.30%	0.00%	4.30%	0.00%	8.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	2	101 to 300	5.30%	0.00%	0.00%	11.80%	8.70%	3.60%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	2	301 to 500	5.30%	7.70%	0.00%	5.90%	0.00%	10.70%	4.00%	0.00%	0.00%	0.00%	3.30%	3.80%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	2	501 to 700	0.00%	0.00%	0.00%	0.00%	8.70%	14.30%	4.00%	4.50%	9.10%	3.60%	6.70%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	2	701+	5.30%	0.00%	0.00%	17.60%	4.30%	7.10%	20.00%	22.70%	22.70%	21.40%	13.30%	7.70%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	3 to 4	101 to 300	0.00%	0.00%	8.30%	0.00%	0.00%	3.60%	4.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	3 to 4	301 to 500	0.00%	7.70%	0.00%	0.00%	0.00%	3.60%	0.00%	0.00%	4.50%	3.60%	6.70%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	3.60%	0.00%	0.00%	0.00%	3.60%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	5 to 9	101 to 300	5.30%	7.70%	0.00%	0.00%	8.70%	3.60%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	5 to 9	301 to 500	5.30%	0.00%	0.00%	0.00%	8.70%	0.00%	4.00%	0.00%	0.00%	3.60%	0.00%	3.80%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	5 to 9	501 to 700	15.80%	7.70%	8.30%	5.90%	4.30%	3.60%	0.00%	0.00%	0.00%	3.60%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	5 to 9	701+	5.30%	0.00%	0.00%	5.90%	0.00%	0.00%	8.00%	0.00%	4.50%	0.00%	3.30%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	10 to 14	101 to 300	5.30%	0.00%	0.00%	5.90%	4.30%	14.30%	8.00%	9.10%	9.10%	3.60%	3.30%	3.80%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	10 to 14	301 to 500	5.30%	0.00%	16.70%	5.90%	8.70%	7.10%	4.00%	4.50%	9.10%	14.30%	10.00%	11.50%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	10 to 14	501 to 700	5.30%	38.50%	16.70%	5.90%	8.70%	3.60%	8.00%	0.00%	0.00%	7.10%	0.00%	11.50%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	10 to 14	701+	10.50%	15.40%	16.70%	11.80%	4.30%	17.90%	16.00%	31.80%	27.30%	21.40%	36.70%	30.80%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	15 to 19	1 to 100	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	15 to 19	101 to 300	5.30%	0.00%	0.00%	5.90%	4.30%	0.00%	4.00%	4.50%	0.00%	0.00%	3.30%	7.70%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	7.10%	3.30%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	15 to 19	501 to 700	5.30%	0.00%	0.00%	5.90%	8.70%	3.60%	0.00%	0.00%	0.00%	0.00%	3.30%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	15 to 19	701+	10.50%	7.70%	16.70%	11.80%	4.30%	0.00%	4.00%	0.00%	4.50%	7.10%	6.70%	11.50%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	20 to 39	101 to 300	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	37	Maine Nearshore Zone C 3-6 Miles Pocket	20 to 39	701+	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	3 to 4	1 to 100	13.30%	0.00%	12.50%	12.50%	0.00%	0.00%	8.00%	3.70%	3.60%	0.00%	0.00%	11.10%
ME	38	Maine Nearshore Zone D 3-6 Miles	3 to 4	101 to 300	6.70%	0.00%	6.30%	18.80%	4.30%	8.70%	4.00%	7.40%	7.10%	6.90%	13.80%	7.40%
ME	38	Maine Nearshore Zone D 3-6 Miles	3 to 4	301 to 500	13.30%	0.00%	12.50%	6.30%	13.00%	0.00%	8.00%	3.70%	0.00%	3.40%	6.90%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	3 to 4	501 to 700	0.00%	0.00%	6.30%	12.50%	13.00%	17.40%	8.00%	7.40%	7.10%	6.90%	13.80%	14.80%
ME	38	Maine Nearshore Zone D 3-6 Miles	3 to 4	701+	33.30%	44.40%	31.30%	31.30%	26.10%	43.50%	36.00%	44.40%	50.00%	41.40%	34.50%	22.20%
ME	38	Maine Nearshore Zone D 3-6 Miles	5 to 9	101 to 300	0.00%	0.00%	0.00%	0.00%	4.30%	4.30%	4.00%	0.00%	0.00%	3.40%	0.00%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%	3.40%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	5 to 9	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.60%	0.00%	0.00%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	5 to 9	701+	6.70%	11.10%	6.30%	6.30%	0.00%	0.00%	0.00%	0.00%	3.60%	6.90%	3.40%	7.40%
ME	38	Maine Nearshore Zone D 3-6 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	38	Maine Nearshore Zone D 3-6 Miles	10 to 14	101 to 300	0.00%	0.00%	0.00%	0.00%	13.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	38	Maine Nearshore Zone D 3-6 Miles	10 to 14	301 to 500	6.70%	22.20%	18.80%	12.50%	8.70%	17.40%	0.00%	3.70%	3.60%	0.00%	3.40%	3.70%
ME	38	Maine Nearshore Zone D 3-6 Miles	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	8.00%	3.70%	3.60%	6.90%	6.90%	11.10%
ME	38	Maine Nearshore Zone D 3-6 Miles	10 to 14	701+	0.00%	0.00%	0.00%	0.00%	8.70%	4.30%	4.00%	11.10%	7.10%	10.30%	3.40%	3.70%
ME	38	Maine Nearshore Zone D 3-6 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	4.30%	4.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	38	Maine Nearshore Zone D 3-6 Miles	15 to 19	301 to 500	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	15 to 19	501 to 700	0.00%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	15 to 19	701+	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	7.40%	0.00%	0.00%	3.40%	3.70%
ME	38	Maine Nearshore Zone D 3-6 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%	3.60%	3.40%	0.00%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	38	Maine Nearshore Zone D 3-6 Miles	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	4.00%	3.70%	0.00%	0.00%	0.00%	0.00%
ME	38	Maine Nearshore Zone D 3-6 Miles	20 to 39	701+	6.70%	11.10%	6.30%	0.00%	0.00%	0.00%	4.00%	0.00%	7.10%	3.40%	6.90%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	2	1 to 100	6.70%	0.00%	12.50%	6.30%	0.00%	0.00%	8.00%	3.70%	3.60%	0.00%	0.00%	11.10%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	2	101 to 300	0.00%	0.00%	0.00%	18.80%	4.30%	4.30%	4.00%	7.40%	7.10%	3.40%	13.80%	7.40%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	2	301 to 500	13.30%	0.00%	12.50%	6.30%	13.00%	0.00%	8.00%	0.00%	0.00%	3.40%	6.90%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	2	501 to 700	0.00%	0.00%	0.00%	12.50%	4.30%	13.00%	4.00%	3.70%	3.60%	3.40%	6.90%	11.10%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	2	701+	13.30%	0.00%	0.00%	6.30%	17.40%	34.80%	28.00%	37.00%	35.70%	34.50%	27.60%	14.80%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	3 to 4	1 to 100	6.70%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	3 to 4	101 to 300	6.70%	0.00%	6.30%	0.00%	0.00%	4.30%	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	3 to 4	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%	0.00%	0.00%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	3 to 4	501 to 700	0.00%	0.00%	6.30%	0.00%	8.70%	4.30%	4.00%	3.70%	3.60%	3.40%	6.90%	3.70%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	3 to 4	701+	20.00%	44.40%	31.30%	25.00%	8.70%	8.70%	8.00%	7.40%	14.30%	6.90%	6.90%	7.40%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	5 to 9	101 to 300	0.00%	0.00%	0.00%	0.00%	4.30%	4.30%	4.00%	0.00%	0.00%	3.40%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%	3.40%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	5 to 9	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.60%	0.00%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	5 to 9	701+	6.70%	11.10%	6.30%	6.30%	0.00%	0.00%	0.00%	0.00%	3.60%	6.90%	3.40%	7.40%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	10 to 14	101 to 300	0.00%	0.00%	0.00%	0.00%	13.00%	0.00%	4.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	10 to 14	301 to 500	6.70%	22.20%	18.80%	12.50%	8.70%	17.40%	0.00%	3.70%	3.60%	0.00%	3.40%	3.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	8.00%	3.70%	3.60%	6.90%	6.90%	11.10%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	10 to 14	701+	0.00%	0.00%	0.00%	0.00%	8.70%	4.30%	4.00%	11.10%	7.10%	10.30%	3.40%	3.70%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	4.30%	4.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	15 to 19	301 to 500	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	15 to 19	501 to 700	0.00%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	15 to 19	701+	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	7.40%	0.00%	0.00%	3.40%	3.70%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%	3.60%	3.40%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	4.00%	3.70%	0.00%	0.00%	0.00%	0.00%
ME	39	Maine Nearshore Zone D 3-6 Miles Pocket	20 to 39	701+	6.70%	11.10%	6.30%	0.00%	0.00%	0.00%	4.00%	0.00%	7.10%	3.40%	6.90%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	2	1 to 100	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	0.00%	0.00%	0.00%	8.30%	5.60%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	2	101 to 300	9.10%	0.00%	0.00%	14.30%	9.10%	10.00%	0.00%	0.00%	0.00%	0.00%	11.10%	7.10%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	2	301 to 500	9.10%	20.00%	0.00%	0.00%	0.00%	10.00%	14.30%	18.20%	16.70%	8.30%	5.60%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	2	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	9.10%	8.30%	0.00%	0.00%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	9.10%	0.00%	0.00%	0.00%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	3 to 4	101 to 300	0.00%	0.00%	0.00%	0.00%	9.10%	20.00%	0.00%	18.20%	8.30%	0.00%	11.10%	14.30%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	3 to 4	301 to 500	0.00%	20.00%	37.50%	28.60%	27.30%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	3 to 4	501 to 700 adjusted for max traps	18.20%	0.00%	12.50%	14.30%	9.10%	0.00%	0.00%	0.00%	16.70%	25.00%	5.60%	7.10%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	5 to 9	1 to 100	9.10%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	9.10%	0.00%	0.00%	0.00%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	5 to 9	101 to 300	9.10%	20.00%	12.50%	14.30%	9.10%	0.00%	14.30%	9.10%	0.00%	0.00%	5.60%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	5 to 9	301 to 500	27.30%	20.00%	12.50%	14.30%	9.10%	0.00%	14.30%	18.20%	16.70%	8.30%	5.60%	14.30%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	5 to 9	501 to 700 adjusted for max traps	9.10%	20.00%	25.00%	14.30%	9.10%	10.00%	0.00%	0.00%	16.70%	16.70%	11.10%	7.10%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	7.10%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	10 to 14	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	10 to 14	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.30%	25.00%	22.20%	21.40%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	0.00%
ME	40	Maine Nearshore Zone E 3-6 Miles Pocket Zone E (Trap Limits)	15 to 19	501 to 700 adjusted for max traps	9.10%	0.00%	0.00%	0.00%	9.10%	10.00%	14.30%	9.10%	8.30%	8.30%	5.60%	7.10%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	14.30%	9.10%	0.00%	8.30%	5.60%	0.00%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	3 to 4	101 to 300	9.10%	0.00%	0.00%	14.30%	18.20%	30.00%	0.00%	18.20%	8.30%	0.00%	22.20%	21.40%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	3 to 4	301 to 500	9.10%	40.00%	37.50%	28.60%	27.30%	30.00%	14.30%	18.20%	16.70%	8.30%	5.60%	0.00%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	3 to 4	501 to 700 adjusted for max traps	18.20%	0.00%	12.50%	14.30%	9.10%	0.00%	14.30%	9.10%	25.00%	25.00%	5.60%	7.10%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	5 to 9	1 to 100	9.10%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	9.10%	0.00%	0.00%	0.00%	0.00%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	5 to 9	101 to 300	9.10%	20.00%	12.50%	14.30%	9.10%	0.00%	14.30%	9.10%	0.00%	0.00%	5.60%	0.00%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	5 to 9	301 to 500	27.30%	20.00%	12.50%	14.30%	9.10%	0.00%	14.30%	18.20%	16.70%	8.30%	5.60%	14.30%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	5 to 9	501 to 700 adjusted for max traps	9.10%	20.00%	25.00%	14.30%	9.10%	10.00%	0.00%	0.00%	16.70%	16.70%	11.10%	7.10%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	7.10%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	10 to 14	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	10 to 14	501 to 700 adjusted for max traps	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.30%	25.00%	22.20%	21.40%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	0.00%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	0.00%
ME	41	Maine Nearshore Zone E 3-6 Miles Zone E (Trap Limits)	15 to 19	501 to 700 adjusted for max traps	9.10%	0.00%	0.00%	0.00%	9.10%	10.00%	14.30%	9.10%	8.30%	8.30%	5.60%	7.10%
ME	42	Maine Nearshore Zone F 3-6 Miles	3 to 4	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.10%	14.30%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	3 to 4	101 to 300	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%
ME	42	Maine Nearshore Zone F 3-6 Miles	3 to 4	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	3 to 4	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.10%	14.30%	12.50%	12.50%	14.30%	12.50%
ME	42	Maine Nearshore Zone F 3-6 Miles	5 to 9	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	12.50%	14.30%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	5 to 9	501 to 700	14.30%	14.30%	0.00%	0.00%	12.50%	37.50%	11.10%	28.60%	12.50%	12.50%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	5 to 9	701+	14.30%	14.30%	20.00%	12.50%	0.00%	0.00%	22.20%	0.00%	12.50%	12.50%	0.00%	12.50%
ME	42	Maine Nearshore Zone F 3-6 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	10 to 14	101 to 300	0.00%	14.30%	0.00%	12.50%	12.50%	0.00%	0.00%	0.00%	12.50%	12.50%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	10 to 14	301 to 500	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	12.50%
ME	42	Maine Nearshore Zone F 3-6 Miles	10 to 14	501 to 700	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	25.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	10 to 14	701+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	14.30%	12.50%
ME	42	Maine Nearshore Zone F 3-6 Miles	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	42	Maine Nearshore Zone F 3-6 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	14.30%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	15 to 19	701+	28.60%	28.60%	20.00%	12.50%	12.50%	12.50%	0.00%	14.30%	12.50%	12.50%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%
ME	42	Maine Nearshore Zone F 3-6 Miles	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	12.50%	12.50%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	20 to 39	301 to 500	0.00%	14.30%	20.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	20 to 39	501 to 700	14.30%	14.30%	20.00%	12.50%	25.00%	0.00%	11.10%	14.30%	0.00%	0.00%	0.00%	0.00%
ME	42	Maine Nearshore Zone F 3-6 Miles	20 to 39	701+	14.30%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	14.30%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	3 to 4	1 to 100	7.70%	0.00%	0.00%	0.00%	0.00%	10.50%	5.90%	6.30%	0.00%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	3 to 4	101 to 300	15.40%	0.00%	9.10%	20.00%	18.80%	15.80%	11.80%	12.50%	12.50%	15.80%	5.00%	11.80%
ME	43	Maine Nearshore Zone G 3-6 Miles	3 to 4	301 to 500	0.00%	0.00%	0.00%	6.70%	6.30%	10.50%	11.80%	12.50%	12.50%	10.50%	15.00%	5.90%
ME	43	Maine Nearshore Zone G 3-6 Miles	3 to 4	501 to 700	0.00%	0.00%	9.10%	0.00%	6.30%	0.00%	0.00%	0.00%	6.30%	5.30%	15.00%	17.60%
ME	43	Maine Nearshore Zone G 3-6 Miles	3 to 4	701+	23.10%	25.00%	36.40%	13.30%	12.50%	15.80%	17.60%	18.80%	18.80%	15.80%	15.00%	17.60%
ME	43	Maine Nearshore Zone G 3-6 Miles	5 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	5.90%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	5 to 9	501 to 700	7.70%	12.50%	9.10%	13.30%	0.00%	0.00%	0.00%	6.30%	0.00%	5.30%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	5 to 9	701+	7.70%	12.50%	0.00%	6.70%	6.30%	5.30%	5.90%	6.30%	12.50%	10.50%	5.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	11.80%	6.30%	6.30%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	10 to 14	101 to 300	0.00%	0.00%	0.00%	0.00%	6.30%	10.50%	0.00%	6.30%	0.00%	10.50%	10.00%	5.90%
ME	43	Maine Nearshore Zone G 3-6 Miles	10 to 14	301 to 500	0.00%	0.00%	0.00%	6.70%	6.30%	5.30%	5.90%	6.30%	12.50%	5.30%	5.00%	5.90%
ME	43	Maine Nearshore Zone G 3-6 Miles	10 to 14	501 to 700	0.00%	12.50%	0.00%	0.00%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	5.00%	5.90%
ME	43	Maine Nearshore Zone G 3-6 Miles	10 to 14	701+	7.70%	0.00%	0.00%	0.00%	6.30%	0.00%	11.80%	6.30%	6.30%	10.50%	5.00%	5.90%
ME	43	Maine Nearshore Zone G 3-6 Miles	15 to 19	101 to 300	0.00%	0.00%	9.10%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	15 to 19	301 to 500	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	15 to 19	701+	7.70%	12.50%	9.10%	13.30%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	10.00%	5.90%
ME	43	Maine Nearshore Zone G 3-6 Miles	20 to 39	101 to 300	0.00%	0.00%	0.00%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	43	Maine Nearshore Zone G 3-6 Miles	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	5.90%	0.00%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	43	Maine Nearshore Zone G 3-6 Miles	20 to 39	701+	15.40%	25.00%	18.20%	6.70%	6.30%	5.30%	5.90%	12.50%	12.50%	10.50%	10.00%	17.60%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	1	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	10.50%	5.90%	6.30%	0.00%	0.00%	0.00%	0.00%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	1	101 to 300	0.00%	0.00%	0.00%	6.70%	6.30%	10.50%	11.80%	6.30%	6.30%	10.50%	5.00%	5.90%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	1	301 to 500	0.00%	0.00%	0.00%	6.70%	0.00%	5.30%	5.90%	6.30%	12.50%	5.30%	5.00%	5.90%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	1	701+	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	5.00%	0.00%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	2	1 to 100	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	2	101 to 300	7.70%	0.00%	9.10%	6.70%	6.30%	0.00%	0.00%	6.30%	6.30%	5.30%	0.00%	0.00%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	2	301 to 500	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	5.90%	6.30%	0.00%	0.00%	10.00%	0.00%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	2	501 to 700	0.00%	0.00%	9.10%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	5.00%	11.80%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	2	701+	15.40%	25.00%	27.30%	13.30%	12.50%	15.80%	17.60%	18.80%	12.50%	10.50%	10.00%	11.80%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	3 to 4 adjusted for max tpt - 3	1 to 100	0.00%	0.00%	0.00%	0.00%	6.30%	5.30%	11.80%	6.30%	6.30%	0.00%	0.00%	0.00%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	3 to 4 adjusted for max tpt - 3	101 to 300	7.70%	0.00%	9.10%	20.00%	12.50%	15.80%	0.00%	6.30%	0.00%	10.50%	10.00%	11.80%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	3 to 4 adjusted for max tpt - 3	301 to 500	7.70%	0.00%	0.00%	6.70%	18.80%	5.30%	11.80%	6.30%	12.50%	10.50%	5.00%	5.90%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	3 to 4 adjusted for max tpt - 3	501 to 700	7.70%	25.00%	9.10%	13.30%	12.50%	10.50%	5.90%	6.30%	0.00%	5.30%	15.00%	11.80%
ME	44	Maine Nearshore Zone G 3-6 Miles (Southern Maine Trawl Limits)	3 to 4 adjusted for max tpt - 3	701+	38.50%	50.00%	36.40%	26.70%	18.80%	15.80%	23.50%	25.00%	31.30%	31.60%	30.00%	35.30%
ME	45	Maine Nearshore Zone A 6-12 Miles	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	5.40%	2.30%	4.40%	4.00%	0.00%	0.00%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	5 to 9	101 to 300	0.00%	0.00%	7.10%	9.10%	6.10%	0.00%	4.50%	0.00%	0.00%	4.20%	4.70%	6.50%
ME	45	Maine Nearshore Zone A 6-12 Miles	5 to 9	301 to 500	8.30%	0.00%	14.30%	4.50%	12.10%	0.00%	6.80%	2.20%	6.00%	4.20%	9.30%	6.50%
ME	45	Maine Nearshore Zone A 6-12 Miles	5 to 9	501 to 700	8.30%	14.30%	7.10%	13.60%	6.10%	8.10%	2.30%	6.70%	4.00%	8.30%	14.00%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	5 to 9	701+	0.00%	0.00%	0.00%	9.10%	12.10%	18.90%	31.80%	26.70%	22.00%	18.80%	9.30%	6.50%
ME	45	Maine Nearshore Zone A 6-12 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.10%	2.30%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	10 to 14	101 to 300	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	10 to 14	301 to 500	0.00%	0.00%	0.00%	0.00%	3.00%	5.40%	0.00%	4.40%	0.00%	4.20%	2.30%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	10 to 14	501 to 700	0.00%	0.00%	0.00%	0.00%	3.00%	2.70%	2.30%	4.40%	4.00%	2.10%	0.00%	9.70%
ME	45	Maine Nearshore Zone A 6-12 Miles	10 to 14	701+	0.00%	14.30%	7.10%	4.50%	6.10%	8.10%	0.00%	4.40%	2.00%	4.20%	4.70%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	15 to 19	101 to 300	8.30%	0.00%	7.10%	4.50%	3.00%	2.70%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	15 to 19	301 to 500	16.70%	28.60%	14.30%	13.60%	9.10%	2.70%	0.00%	0.00%	2.00%	2.10%	0.00%	3.20%
ME	45	Maine Nearshore Zone A 6-12 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	9.10%	5.40%	0.00%	2.20%	0.00%	0.00%	2.30%	0.00%
ME	45	Maine Nearshore Zone A 6-12 Miles	15 to 19	701+	0.00%	0.00%	7.10%	0.00%	3.00%	5.40%	9.10%	17.80%	14.00%	10.40%	20.90%	6.50%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	45	Maine Nearshore Zone A 6-12 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	2.30%	2.20%	2.00%	2.10%	2.30%	0.00%
ME	45	Maine Nearshore Zone A 6-12 Miles	20 to 39	101 to 300	8.30%	14.30%	7.10%	4.50%	3.00%	5.40%	2.30%	0.00%	2.00%	0.00%	0.00%	6.50%
ME	45	Maine Nearshore Zone A 6-12 Miles	20 to 39	301 to 500	25.00%	0.00%	14.30%	22.70%	9.10%	0.00%	9.10%	2.20%	4.00%	4.20%	2.30%	0.00%
ME	45	Maine Nearshore Zone A 6-12 Miles	20 to 39	501 to 700	8.30%	14.30%	7.10%	4.50%	6.10%	8.10%	2.30%	2.20%	4.00%	4.20%	4.70%	9.70%
ME	45	Maine Nearshore Zone A 6-12 Miles	20 to 39	701+	16.70%	14.30%	7.10%	4.50%	9.10%	18.90%	25.00%	20.00%	30.00%	29.20%	18.60%	22.60%
ME	46	Maine Nearshore Zone B 6-12 Miles	5 to 9	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	10.50%	4.80%	0.00%	4.30%	0.00%	0.00%	0.00%
ME	46	Maine Nearshore Zone B 6-12 Miles	5 to 9	101 to 300	20.00%	0.00%	8.30%	6.70%	26.70%	15.80%	9.50%	16.70%	8.70%	11.10%	14.80%	14.30%
ME	46	Maine Nearshore Zone B 6-12 Miles	5 to 9	301 to 500	26.70%	40.00%	33.30%	26.70%	6.70%	10.50%	9.50%	11.10%	8.70%	14.80%	7.40%	23.80%
ME	46	Maine Nearshore Zone B 6-12 Miles	5 to 9	501 to 700	6.70%	40.00%	16.70%	20.00%	33.30%	31.60%	23.80%	11.10%	17.40%	14.80%	33.30%	9.50%
ME	46	Maine Nearshore Zone B 6-12 Miles	5 to 9	701+	13.30%	0.00%	0.00%	6.70%	6.70%	10.50%	23.80%	50.00%	39.10%	29.60%	11.10%	14.30%
ME	46	Maine Nearshore Zone B 6-12 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	46	Maine Nearshore Zone B 6-12 Miles	10 to 14	101 to 300	6.70%	0.00%	8.30%	6.70%	13.30%	0.00%	4.80%	0.00%	0.00%	3.70%	0.00%	4.80%
ME	46	Maine Nearshore Zone B 6-12 Miles	10 to 14	301 to 500	13.30%	20.00%	0.00%	13.30%	0.00%	0.00%	0.00%	0.00%	4.30%	7.40%	14.80%	4.80%
ME	46	Maine Nearshore Zone B 6-12 Miles	10 to 14	501 to 700	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	0.00%	0.00%	0.00%	3.70%	4.80%
ME	46	Maine Nearshore Zone B 6-12 Miles	10 to 14	701+	6.70%	0.00%	16.70%	6.70%	0.00%	5.30%	4.80%	0.00%	4.30%	3.70%	7.40%	4.80%
ME	46	Maine Nearshore Zone B 6-12 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	46	Maine Nearshore Zone B 6-12 Miles	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.50%
ME	46	Maine Nearshore Zone B 6-12 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%	3.70%	0.00%
ME	46	Maine Nearshore Zone B 6-12 Miles	15 to 19	701+	0.00%	0.00%	8.30%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%	0.00%	4.80%
ME	46	Maine Nearshore Zone B 6-12 Miles	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	6.70%	5.30%	4.80%	0.00%	4.30%	0.00%	0.00%	0.00%
ME	46	Maine Nearshore Zone B 6-12 Miles	20 to 39	701+	0.00%	0.00%	8.30%	6.70%	6.70%	5.30%	4.80%	11.10%	8.70%	7.40%	3.70%	4.80%
ME	47	Maine Nearshore Zone B 6-12 Miles (Waters Around Mount Desert Rock)	5 to 9 adjusted for max tpt	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	10.50%	9.50%	0.00%	4.30%	0.00%	0.00%	0.00%
ME	47	Maine Nearshore Zone B 6-12 Miles (Waters Around Mount Desert Rock)	5 to 9 adjusted for max tpt	101 to 300	26.70%	0.00%	16.70%	13.30%	40.00%	21.10%	14.30%	16.70%	8.70%	14.80%	14.80%	19.00%
ME	47	Maine Nearshore Zone B 6-12 Miles (Waters Around Mount Desert Rock)	5 to 9 adjusted for max tpt	301 to 500	40.00%	60.00%	33.30%	40.00%	13.30%	15.80%	14.30%	11.10%	17.40%	22.20%	22.20%	38.10%
ME	47	Maine Nearshore Zone B 6-12 Miles (Waters Around Mount Desert Rock)	5 to 9 adjusted for max tpt	501 to 700	13.30%	40.00%	16.70%	20.00%	33.30%	31.60%	28.60%	11.10%	17.40%	18.50%	40.70%	14.30%
ME	47	Maine Nearshore Zone B 6-12 Miles (Waters Around Mount Desert Rock)	5 to 9 adjusted for max tpt	701+	20.00%	0.00%	33.30%	26.70%	13.30%	21.10%	33.30%	61.10%	52.20%	44.40%	22.20%	28.60%
ME	48	Maine Nearshore Zone C 6-12 Miles	5 to 9	1 to 100	0.00%	0.00%	8.30%	0.00%	4.30%	0.00%	8.00%	9.10%	0.00%	0.00%	0.00%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	5 to 9	101 to 300	10.50%	7.70%	8.30%	11.80%	17.40%	10.70%	8.00%	4.50%	0.00%	0.00%	0.00%	7.70%
ME	48	Maine Nearshore Zone C 6-12 Miles	5 to 9	301 to 500	10.50%	15.40%	0.00%	5.90%	8.70%	14.30%	8.00%	0.00%	4.50%	7.10%	10.00%	7.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	48	Maine Nearshore Zone C 6-12 Miles	5 to 9	501 to 700	15.80%	7.70%	8.30%	5.90%	17.40%	17.90%	4.00%	4.50%	9.10%	7.10%	6.70%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	5 to 9	701+	10.50%	0.00%	0.00%	23.50%	4.30%	10.70%	28.00%	22.70%	27.30%	25.00%	16.70%	7.70%
ME	48	Maine Nearshore Zone C 6-12 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	10 to 14	101 to 300	5.30%	0.00%	0.00%	5.90%	4.30%	14.30%	8.00%	9.10%	9.10%	3.60%	3.30%	3.80%
ME	48	Maine Nearshore Zone C 6-12 Miles	10 to 14	301 to 500	5.30%	0.00%	16.70%	5.90%	8.70%	7.10%	4.00%	4.50%	9.10%	14.30%	10.00%	11.50%
ME	48	Maine Nearshore Zone C 6-12 Miles	10 to 14	501 to 700	5.30%	38.50%	16.70%	5.90%	8.70%	3.60%	8.00%	0.00%	0.00%	7.10%	0.00%	11.50%
ME	48	Maine Nearshore Zone C 6-12 Miles	10 to 14	701+	10.50%	15.40%	16.70%	11.80%	4.30%	17.90%	16.00%	31.80%	27.30%	21.40%	36.70%	30.80%
ME	48	Maine Nearshore Zone C 6-12 Miles	15 to 19	1 to 100	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	15 to 19	101 to 300	5.30%	0.00%	0.00%	5.90%	4.30%	0.00%	4.00%	4.50%	0.00%	0.00%	3.30%	7.70%
ME	48	Maine Nearshore Zone C 6-12 Miles	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	7.10%	3.30%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	15 to 19	501 to 700	5.30%	0.00%	0.00%	5.90%	8.70%	3.60%	0.00%	0.00%	0.00%	0.00%	3.30%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	15 to 19	701+	10.50%	7.70%	16.70%	11.80%	4.30%	0.00%	4.00%	0.00%	4.50%	7.10%	6.70%	11.50%
ME	48	Maine Nearshore Zone C 6-12 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%	0.00%	0.00%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	20 to 39	101 to 300	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	48	Maine Nearshore Zone C 6-12 Miles	20 to 39	701+	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	49	Maine Nearshore Zone D 6-12 Miles	10 to 14	1 to 100	13.30%	0.00%	12.50%	12.50%	0.00%	0.00%	8.00%	3.70%	3.60%	0.00%	0.00%	14.80%
ME	49	Maine Nearshore Zone D 6-12 Miles	10 to 14	101 to 300	6.70%	0.00%	6.30%	18.80%	21.70%	13.00%	12.00%	7.40%	7.10%	10.30%	13.80%	11.10%
ME	49	Maine Nearshore Zone D 6-12 Miles	10 to 14	301 to 500	20.00%	22.20%	31.30%	18.80%	21.70%	17.40%	8.00%	7.40%	3.60%	6.90%	13.80%	3.70%
ME	49	Maine Nearshore Zone D 6-12 Miles	10 to 14	501 to 700	0.00%	0.00%	6.30%	12.50%	17.40%	17.40%	16.00%	11.10%	14.30%	13.80%	20.70%	25.90%
ME	49	Maine Nearshore Zone D 6-12 Miles	10 to 14	701+	40.00%	55.60%	37.50%	37.50%	34.80%	47.80%	40.00%	55.60%	60.70%	58.60%	41.40%	33.30%
ME	49	Maine Nearshore Zone D 6-12 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	4.30%	4.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	49	Maine Nearshore Zone D 6-12 Miles	15 to 19	301 to 500	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%
ME	49	Maine Nearshore Zone D 6-12 Miles	15 to 19	501 to 700	0.00%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	49	Maine Nearshore Zone D 6-12 Miles	15 to 19	701+	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	7.40%	0.00%	0.00%	3.40%	3.70%
ME	49	Maine Nearshore Zone D 6-12 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%	3.60%	3.40%	0.00%	0.00%
ME	49	Maine Nearshore Zone D 6-12 Miles	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
ME	49	Maine Nearshore Zone D 6-12 Miles	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	4.00%	3.70%	0.00%	0.00%	0.00%	0.00%
ME	49	Maine Nearshore Zone D 6-12 Miles	20 to 39	701+	6.70%	11.10%	6.30%	0.00%	0.00%	0.00%	4.00%	0.00%	7.10%	3.40%	6.90%	0.00%
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	10 to 14	1 to 100	9.10%	0.00%	0.00%	0.00%	9.10%	20.00%	28.60%	18.20%	0.00%	8.30%	5.60%	7.10%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	10 to 14	101 to 300	18.20%	20.00%	12.50%	28.60%	27.30%	30.00%	14.30%	27.30%	8.30%	0.00%	27.80%	28.60%
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	10 to 14	301 to 500	36.40%	60.00%	50.00%	42.90%	36.40%	30.00%	28.60%	36.40%	33.30%	16.70%	11.10%	14.30%
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	10 to 14	501 to 700 adjusted for max traps	27.30%	20.00%	37.50%	28.60%	18.20%	10.00%	14.30%	9.10%	50.00%	66.70%	38.90%	35.70%
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	0.00%
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	0.00%
ME	50	Maine Nearshore Zone E 6-12 Miles Zone E (Trap Limits)	15 to 19	501 to 700 adjusted for max traps	9.10%	0.00%	0.00%	0.00%	9.10%	10.00%	14.30%	9.10%	8.30%	8.30%	5.60%	7.10%
ME	51	Maine Nearshore Zone F 6-12 Miles	10 to 14	1 to 100	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	11.10%	28.60%	0.00%	0.00%	0.00%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	10 to 14	101 to 300	0.00%	14.30%	0.00%	25.00%	12.50%	12.50%	11.10%	0.00%	12.50%	12.50%	0.00%	12.50%
ME	51	Maine Nearshore Zone F 6-12 Miles	10 to 14	301 to 500	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	25.00%	14.30%	12.50%
ME	51	Maine Nearshore Zone F 6-12 Miles	10 to 14	501 to 700	28.60%	14.30%	0.00%	0.00%	12.50%	50.00%	11.10%	28.60%	12.50%	12.50%	14.30%	25.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	10 to 14	701+	14.30%	14.30%	20.00%	12.50%	0.00%	0.00%	33.30%	14.30%	37.50%	25.00%	28.60%	37.50%
ME	51	Maine Nearshore Zone F 6-12 Miles	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	14.30%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	15 to 19	701+	28.60%	28.60%	20.00%	12.50%	12.50%	12.50%	0.00%	14.30%	12.50%	12.50%	0.00%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%
ME	51	Maine Nearshore Zone F 6-12 Miles	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	12.50%	12.50%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	20 to 39	301 to 500	0.00%	14.30%	20.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	20 to 39	501 to 700	14.30%	14.30%	20.00%	12.50%	25.00%	0.00%	11.10%	14.30%	0.00%	0.00%	0.00%	0.00%
ME	51	Maine Nearshore Zone F 6-12 Miles	20 to 39	701+	14.30%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	14.30%	0.00%
ME	52	Maine Nearshore Zone G 6-12 Miles	10 to 14	1 to 100	7.70%	0.00%	0.00%	0.00%	6.30%	15.80%	17.60%	12.50%	6.30%	0.00%	0.00%	0.00%
ME	52	Maine Nearshore Zone G 6-12 Miles	10 to 14	101 to 300	15.40%	0.00%	9.10%	20.00%	25.00%	26.30%	11.80%	18.80%	12.50%	26.30%	15.00%	17.60%
ME	52	Maine Nearshore Zone G 6-12 Miles	10 to 14	301 to 500	0.00%	0.00%	0.00%	13.30%	18.80%	15.80%	23.50%	18.80%	25.00%	15.80%	20.00%	11.80%
ME	52	Maine Nearshore Zone G 6-12 Miles	10 to 14	501 to 700	7.70%	25.00%	18.20%	13.30%	6.30%	5.30%	0.00%	6.30%	6.30%	10.50%	20.00%	23.50%
ME	52	Maine Nearshore Zone G 6-12 Miles	10 to 14	701+	38.50%	37.50%	36.40%	20.00%	25.00%	21.10%	35.30%	31.30%	37.50%	36.80%	25.00%	23.50%
ME	52	Maine Nearshore Zone G 6-12 Miles	15 to 19	101 to 300	0.00%	0.00%	9.10%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	52	Maine Nearshore Zone G 6-12 Miles	15 to 19	301 to 500	7.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	52	Maine Nearshore Zone G 6-12 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	52	Maine Nearshore Zone G 6-12 Miles	15 to 19	701+	7.70%	12.50%	9.10%	13.30%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	10.00%	5.90%
ME	52	Maine Nearshore Zone G 6-12 Miles	20 to 39	101 to 300	0.00%	0.00%	0.00%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	52	Maine Nearshore Zone G 6-12 Miles	20 to 39	301 to 500	0.00%	0.00%	0.00%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	52	Maine Nearshore Zone G 6-12 Miles	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	5.90%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	52	Maine Nearshore Zone G 6-12 Miles	20 to 39	701+	15.40%	25.00%	18.20%	6.70%	6.30%	5.30%	5.90%	12.50%	12.50%	10.50%	10.00%	17.60%
ME	53	Maine Nearshore Zone A +12 Miles	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%
ME	53	Maine Nearshore Zone A +12 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	12.50%	0.00%	0.00%	0.00%
ME	53	Maine Nearshore Zone A +12 Miles	15 to 19	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	8.30%	10.00%	12.50%	12.50%	11.10%	0.00%	0.00%
ME	53	Maine Nearshore Zone A +12 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	8.30%
ME	53	Maine Nearshore Zone A +12 Miles	15 to 19	701+	18.20%	12.50%	18.20%	15.40%	18.20%	8.30%	20.00%	12.50%	12.50%	22.20%	7.70%	8.30%
ME	53	Maine Nearshore Zone A +12 Miles	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	7.70%	16.70%
ME	53	Maine Nearshore Zone A +12 Miles	20 to 39	301 to 500	9.10%	25.00%	18.20%	7.70%	18.20%	8.30%	30.00%	12.50%	12.50%	33.30%	15.40%	8.30%
ME	53	Maine Nearshore Zone A +12 Miles	20 to 39	501 to 700	0.00%	0.00%	0.00%	7.70%	0.00%	0.00%	10.00%	25.00%	12.50%	0.00%	0.00%	8.30%
ME	53	Maine Nearshore Zone A +12 Miles	20 to 39	701+	72.70%	62.50%	63.60%	69.20%	63.60%	75.00%	20.00%	25.00%	37.50%	33.30%	53.80%	50.00%
ME	54	Maine Nearshore Zone B +12 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	33.30%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	54	Maine Nearshore Zone B +12 Miles	15 to 19	301 to 500	20.00%	0.00%	0.00%	16.70%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%
ME	54	Maine Nearshore Zone B +12 Miles	15 to 19	501 to 700	0.00%	0.00%	0.00%	16.70%	16.70%	0.00%	25.00%	0.00%	100.00%	50.00%	0.00%	0.00%
ME	54	Maine Nearshore Zone B +12 Miles	15 to 19	701+	20.00%	50.00%	40.00%	33.30%	16.70%	40.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	54	Maine Nearshore Zone B +12 Miles	20 to 39	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
ME	54	Maine Nearshore Zone B +12 Miles	20 to 39	301 to 500	20.00%	25.00%	20.00%	16.70%	16.70%	20.00%	25.00%	0.00%	0.00%	50.00%	0.00%	0.00%
ME	54	Maine Nearshore Zone B +12 Miles	20 to 39	701+	40.00%	25.00%	40.00%	16.70%	16.70%	20.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	55	Maine Nearshore Zone C +12 Miles	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	28.60%	0.00%	60.00%	0.00%	0.00%	0.00%	20.00%	0.00%
ME	55	Maine Nearshore Zone C +12 Miles	15 to 19	301 to 500	0.00%	14.30%	0.00%	0.00%	14.30%	33.30%	0.00%	50.00%	0.00%	25.00%	0.00%	20.00%
ME	55	Maine Nearshore Zone C +12 Miles	15 to 19	501 to 700	33.30%	28.60%	25.00%	0.00%	0.00%	16.70%	0.00%	0.00%	50.00%	0.00%	0.00%	0.00%
ME	55	Maine Nearshore Zone C +12 Miles	15 to 19	701+	50.00%	28.60%	50.00%	50.00%	57.10%	33.30%	20.00%	25.00%	25.00%	25.00%	40.00%	40.00%
ME	55	Maine Nearshore Zone C +12 Miles	20 to 39	101 to 300	16.70%	0.00%	0.00%	16.70%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%
ME	55	Maine Nearshore Zone C +12 Miles	20 to 39	301 to 500	0.00%	0.00%	0.00%	16.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	55	Maine Nearshore Zone C +12 Miles	20 to 39	501 to 700	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	25.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ME	55	Maine Nearshore Zone C +12 Miles	20 to 39	701+	0.00%	28.60%	25.00%	16.70%	0.00%	16.70%	20.00%	25.00%	0.00%	0.00%	40.00%	40.00%
ME	56	Maine Nearshore Zone D +12 Miles	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	5.30%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%
ME	56	Maine Nearshore Zone D +12 Miles	15 to 19	101 to 300	4.30%	12.50%	5.30%	9.50%	10.50%	10.50%	6.30%	0.00%	7.10%	6.30%	11.80%	12.50%
ME	56	Maine Nearshore Zone D +12 Miles	15 to 19	301 to 500	13.00%	18.80%	15.80%	4.80%	15.80%	0.00%	12.50%	14.30%	14.30%	12.50%	5.90%	0.00%
ME	56	Maine Nearshore Zone D +12 Miles	15 to 19	501 to 700	17.40%	12.50%	10.50%	9.50%	21.10%	31.60%	6.30%	7.10%	7.10%	12.50%	17.60%	18.80%
ME	56	Maine Nearshore Zone D +12 Miles	15 to 19	701+	56.50%	50.00%	63.20%	61.90%	42.10%	42.10%	68.80%	64.30%	57.10%	50.00%	64.70%	50.00%
ME	56	Maine Nearshore Zone D +12 Miles	20 to 39	101 to 300	4.30%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%	7.10%	7.10%	6.30%	0.00%	0.00%
ME	56	Maine Nearshore Zone D +12 Miles	20 to 39	301 to 500	0.00%	6.30%	5.30%	9.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	56	Maine Nearshore Zone D +12 Miles	20 to 39	501 to 700	4.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%
ME	56	Maine Nearshore Zone D +12 Miles	20 to 39	701+	0.00%	0.00%	0.00%	4.80%	5.30%	10.50%	0.00%	7.10%	7.10%	12.50%	0.00%	6.30%
ME	57	Maine Nearshore Zone E +12 Miles Zone E (Trap Limits)	15 to 19	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	57	Maine Nearshore Zone E +12 Miles Zone E (Trap Limits)	15 to 19	101 to 300	0.00%	0.00%	0.00%	0.00%	20.00%	20.00%	0.00%	25.00%	0.00%	0.00%	25.00%	0.00%
ME	57	Maine Nearshore Zone E +12 Miles Zone E (Trap Limits)	15 to 19	301 to 500	0.00%	14.30%	28.60%	28.60%	0.00%	60.00%	25.00%	0.00%	33.30%	33.30%	25.00%	0.00%
ME	57	Maine Nearshore Zone E +12 Miles Zone E (Trap Limits)	15 to 19	501 to 700 adjusted for max traps	100.00%	85.70%	71.40%	71.40%	80.00%	20.00%	50.00%	75.00%	66.70%	66.70%	50.00%	100.00%
ME	58	Maine Nearshore Zone F +12 Miles	20 to 39	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	58	Maine Nearshore Zone F +12 Miles	20 to 39	101 to 300	50.00%	0.00%	25.00%	25.00%	50.00%	0.00%	33.30%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	58	Maine Nearshore Zone F +12 Miles	20 to 39	301 to 500	0.00%	50.00%	25.00%	25.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	58	Maine Nearshore Zone F +12 Miles	20 to 39	501 to 700	0.00%	25.00%	25.00%	50.00%	50.00%	0.00%	33.30%	0.00%	50.00%	33.30%	0.00%	66.70%
ME	58	Maine Nearshore Zone F +12 Miles	20 to 39	701+	50.00%	25.00%	25.00%	0.00%	0.00%	0.00%	0.00%	100.00%	50.00%	66.70%	100.00%	33.30%
ME	59	Maine Nearshore Zone G +12 Miles	20 to 39	101 to 300	0.00%	25.00%	0.00%	0.00%	33.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	59	Maine Nearshore Zone G +12 Miles	20 to 39	301 to 500	25.00%	0.00%	0.00%	0.00%	33.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	59	Maine Nearshore Zone G +12 Miles	20 to 39	501 to 700	0.00%	0.00%	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ME	59	Maine Nearshore Zone G +12 Miles	20 to 39	701+	75.00%	75.00%	75.00%	100.00%	33.30%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
NH	60	NH Atlantic Exempt	1	1 to 100	0.00%	12.50%	0.00%	3.70%	23.50%	39.50%	41.40%	38.80%	32.80%	18.10%	3.30%	2.40%
NH	60	NH Atlantic Exempt	10 to 15	1 to 100	10.50%	0.00%	11.10%	0.00%	1.50%	2.40%	1.30%	0.70%	0.70%	1.10%	1.70%	2.40%
NH	60	NH Atlantic Exempt	10 to 15	101 to 300	31.60%	25.00%	11.10%	11.10%	4.40%	2.40%	2.60%	3.30%	5.10%	6.40%	11.70%	9.80%
NH	60	NH Atlantic Exempt	10 to 15	301 to 500	10.50%	12.50%	11.10%	25.90%	7.40%	4.80%	3.90%	4.60%	5.10%	9.60%	15.00%	17.10%
NH	60	NH Atlantic Exempt	10 to 15	501 to 800	21.10%	25.00%	22.20%	14.80%	13.20%	8.90%	5.90%	5.90%	6.60%	8.50%	18.30%	22.00%
NH	60	NH Atlantic Exempt	10 to 15	801+	10.50%	0.00%	0.00%	11.10%	10.30%	8.90%	9.20%	9.90%	10.20%	13.80%	13.30%	7.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NH	60	NH Atlantic Exempt	16+	101 to 300	0.00%	0.00%	11.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%
NH	60	NH Atlantic Exempt	16+	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.80%	0.00%	0.00%	0.70%	2.10%	1.70%	0.00%
NH	60	NH Atlantic Exempt	16+	501 to 800	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%
NH	60	NH Atlantic Exempt	16+	801+	0.00%	0.00%	0.00%	0.00%	1.50%	0.00%	0.00%	0.70%	0.70%	0.00%	0.00%	0.00%
NH	60	NH Atlantic Exempt	2	1 to 100	0.00%	0.00%	0.00%	3.70%	4.40%	5.60%	7.90%	8.60%	8.00%	3.20%	1.70%	2.40%
NH	60	NH Atlantic Exempt	2	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.70%	0.70%	0.00%	0.00%	0.00%
NH	60	NH Atlantic Exempt	3	1 to 100	0.00%	0.00%	0.00%	0.00%	1.50%	2.40%	3.30%	1.30%	1.50%	3.20%	1.70%	0.00%
NH	60	NH Atlantic Exempt	3	101 to 300	0.00%	0.00%	0.00%	0.00%	1.50%	0.80%	0.70%	0.70%	0.70%	1.10%	0.00%	0.00%
NH	60	NH Atlantic Exempt	4 to 5	1 to 100	0.00%	0.00%	0.00%	7.40%	4.40%	6.50%	7.20%	9.90%	10.20%	10.60%	10.00%	7.30%
NH	60	NH Atlantic Exempt	4 to 5	101 to 300	0.00%	0.00%	0.00%	0.00%	4.40%	0.80%	0.70%	0.70%	0.70%	1.10%	5.00%	4.90%
NH	60	NH Atlantic Exempt	4 to 5	301 to 500	0.00%	0.00%	0.00%	0.00%	1.50%	0.80%	0.70%	0.70%	0.70%	1.10%	0.00%	2.40%
NH	60	NH Atlantic Exempt	4 to 5	501 to 800	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.30%	1.30%	1.50%	2.10%	1.70%	0.00%
NH	60	NH Atlantic Exempt	6 to 9	1 to 100	5.30%	0.00%	0.00%	0.00%	7.40%	5.60%	3.30%	3.30%	5.10%	7.40%	0.00%	0.00%
NH	60	NH Atlantic Exempt	6 to 9	101 to 300	5.30%	12.50%	11.10%	14.80%	2.90%	2.40%	4.60%	4.60%	3.60%	3.20%	3.30%	12.20%
NH	60	NH Atlantic Exempt	6 to 9	301 to 500	5.30%	0.00%	11.10%	0.00%	1.50%	0.80%	1.30%	1.30%	1.50%	2.10%	5.00%	2.40%
NH	60	NH Atlantic Exempt	6 to 9	501 to 800	0.00%	12.50%	11.10%	3.70%	7.40%	3.20%	2.60%	2.00%	2.20%	4.30%	5.00%	2.40%
NH	60	NH Atlantic Exempt	6 to 9	801+	0.00%	0.00%	0.00%	3.70%	1.50%	1.60%	1.30%	1.30%	1.50%	1.10%	1.70%	0.00%
NH	61	NH Inland Bays Exempt	1	1 to 100	0.00%	0.00%	0.00%	12.50%	44.80%	50.90%	49.20%	50.00%	49.20%	48.90%	44.00%	20.00%
NH	61	NH Inland Bays Exempt	1	101 to 300	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	1.70%	2.10%	0.00%	0.00%
NH	61	NH Inland Bays Exempt	10 to 15	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	1.60%	1.70%	1.70%	2.10%	4.00%	10.00%
NH	61	NH Inland Bays Exempt	10 to 15	101 to 300	0.00%	25.00%	20.00%	0.00%	3.40%	1.80%	4.80%	5.20%	5.10%	6.40%	8.00%	0.00%
NH	61	NH Inland Bays Exempt	10 to 15	301 to 500	33.30%	25.00%	20.00%	12.50%	3.40%	1.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	61	NH Inland Bays Exempt	10 to 15	501 to 800	33.30%	50.00%	40.00%	0.00%	3.40%	3.60%	1.60%	1.70%	1.70%	2.10%	12.00%	30.00%
NH	61	NH Inland Bays Exempt	10 to 15	801+	33.30%	0.00%	0.00%	25.00%	6.90%	5.50%	7.90%	5.20%	6.80%	6.40%	8.00%	10.00%
NH	61	NH Inland Bays Exempt	2	1 to 100	0.00%	0.00%	0.00%	12.50%	13.80%	12.70%	11.10%	10.30%	8.50%	8.50%	8.00%	10.00%
NH	61	NH Inland Bays Exempt	2	101 to 300	0.00%	0.00%	20.00%	12.50%	3.40%	1.80%	4.80%	3.40%	3.40%	4.30%	0.00%	0.00%
NH	61	NH Inland Bays Exempt	3	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	1.60%	5.20%	5.10%	4.30%	4.00%	0.00%
NH	61	NH Inland Bays Exempt	4 to 5	1 to 100	0.00%	0.00%	0.00%	25.00%	17.20%	16.40%	15.90%	13.80%	15.30%	12.80%	8.00%	0.00%
NH	61	NH Inland Bays Exempt	4 to 5	101 to 300	0.00%	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NH	61	NH Inland Bays Exempt	4 to 5	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%
NH	61	NH Inland Bays Exempt	6 to 9	301 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
NH	61	NH Inland Bays Exempt	6 to 9	501 to 800	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.70%	1.70%	2.10%	4.00%	10.00%
MA	62	Mass State Area 1 Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	27.30%	15.80%	36.70%	25.70%	17.20%	12.00%	7.10%	11.10%
MA	62	Mass State Area 1 Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.30%	2.90%	6.90%	0.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%
MA	62	Mass State Area 1 Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	0.00%	2.90%	3.40%	0.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	1	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	3.30%	2.90%	3.40%	4.00%	7.10%	0.00%
MA	62	Mass State Area 1 Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.90%	3.40%	4.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.30%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	3	0 to 99	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	3	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	3.30%	2.90%	0.00%	4.00%	7.10%	0.00%
MA	62	Mass State Area 1 Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%
MA	62	Mass State Area 1 Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.70%	11.40%	17.20%	12.00%	0.00%	11.10%
MA	62	Mass State Area 1 Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	10 to 14	100 to 299	0.00%	50.00%	33.30%	16.70%	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	7.10%	0.00%
MA	62	Mass State Area 1 Exempt	10 to 14	300 to 499	0.00%	0.00%	0.00%	16.70%	9.10%	5.30%	3.30%	2.90%	3.40%	4.00%	0.00%	11.10%
MA	62	Mass State Area 1 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.90%	3.40%	0.00%	7.10%	0.00%
MA	62	Mass State Area 1 Exempt	10 to 14	800+	33.30%	0.00%	0.00%	0.00%	0.00%	0.00%	3.30%	0.00%	0.00%	0.00%	7.10%	11.10%
MA	62	Mass State Area 1 Exempt	15 to 19	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.90%	0.00%	0.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	16.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	3.30%	2.90%	3.40%	4.00%	7.10%	0.00%
MA	62	Mass State Area 1 Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	9.10%	5.30%	6.70%	0.00%	0.00%	4.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	9.10%	5.30%	0.00%	0.00%	3.40%	4.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	20+	100 to 299	33.30%	50.00%	33.30%	33.30%	18.20%	10.50%	6.70%	5.70%	6.90%	8.00%	14.30%	22.20%
MA	62	Mass State Area 1 Exempt	20+	300 to 499	33.30%	0.00%	0.00%	0.00%	0.00%	5.30%	0.00%	2.90%	3.40%	4.00%	0.00%	11.10%
MA	62	Mass State Area 1 Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	9.10%	15.80%	3.30%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	62	Mass State Area 1 Exempt	20+	800+	0.00%	0.00%	33.30%	16.70%	9.10%	15.80%	16.70%	28.60%	24.10%	24.00%	21.40%	22.20%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	63	Mass State Area 2 Exempt	1	0 to 99	2.30%	0.00%	0.00%	2.30%	1.30%	6.90%	10.30%	11.10%	10.10%	8.10%	5.60%	4.90%
MA	63	Mass State Area 2 Exempt	1	100 to 299	0.00%	0.00%	0.00%	4.70%	5.10%	0.90%	2.80%	2.60%	4.00%	4.40%	1.90%	0.00%
MA	63	Mass State Area 2 Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	0.70%	0.70%	0.00%	0.00%	0.00%	0.00%
MA	63	Mass State Area 2 Exempt	2	0 to 99	2.30%	0.00%	0.00%	0.00%	2.60%	1.70%	1.40%	1.30%	1.30%	2.90%	0.00%	0.00%
MA	63	Mass State Area 2 Exempt	2	100 to 299	2.30%	0.00%	0.00%	4.70%	5.10%	6.00%	4.80%	3.90%	3.40%	2.90%	2.80%	4.90%
MA	63	Mass State Area 2 Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.70%	0.70%	0.70%	0.90%	0.00%
MA	63	Mass State Area 2 Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.70%	0.70%	0.00%	0.00%
MA	63	Mass State Area 2 Exempt	2	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	63	Mass State Area 2 Exempt	3	0 to 99	0.00%	4.00%	4.50%	2.30%	2.60%	1.70%	2.80%	3.30%	3.40%	2.90%	1.90%	0.00%
MA	63	Mass State Area 2 Exempt	3	100 to 299	4.70%	4.00%	0.00%	2.30%	1.30%	3.40%	3.40%	3.90%	5.40%	2.90%	4.60%	7.30%
MA	63	Mass State Area 2 Exempt	3	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%	2.80%	2.00%	2.00%	2.20%	1.90%	1.20%
MA	63	Mass State Area 2 Exempt	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%
MA	63	Mass State Area 2 Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	2.00%	2.00%	2.20%	0.90%	1.20%
MA	63	Mass State Area 2 Exempt	6 to 9	100 to 299	7.00%	4.00%	13.60%	4.70%	3.80%	4.30%	3.40%	2.00%	2.00%	2.20%	1.90%	4.90%
MA	63	Mass State Area 2 Exempt	6 to 9	300 to 499	2.30%	4.00%	4.50%	7.00%	2.60%	1.70%	1.40%	0.70%	0.00%	0.00%	0.90%	2.40%
MA	63	Mass State Area 2 Exempt	6 to 9	500 to 799	9.30%	4.00%	4.50%	2.30%	5.10%	0.90%	1.40%	1.30%	1.30%	1.50%	2.80%	1.20%
MA	63	Mass State Area 2 Exempt	10 to 14	0 to 99	4.70%	4.00%	0.00%	2.30%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.90%	0.00%
MA	63	Mass State Area 2 Exempt	10 to 14	100 to 299	14.00%	24.00%	18.20%	14.00%	7.70%	3.40%	2.80%	2.00%	2.70%	2.90%	3.70%	3.70%
MA	63	Mass State Area 2 Exempt	10 to 14	300 to 499	2.30%	0.00%	0.00%	2.30%	5.10%	7.80%	9.00%	9.20%	11.40%	8.80%	9.30%	4.90%
MA	63	Mass State Area 2 Exempt	10 to 14	500 to 799	0.00%	4.00%	4.50%	2.30%	3.80%	7.80%	8.30%	9.20%	8.70%	10.30%	8.30%	8.50%
MA	63	Mass State Area 2 Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	2.60%	6.90%	9.00%	6.50%	6.70%	5.90%	6.50%	6.10%
MA	63	Mass State Area 2 Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	2.30%	0.00%	2.60%	2.80%	2.60%	2.70%	2.20%	0.90%	0.00%
MA	63	Mass State Area 2 Exempt	15 to 19	300 to 499	2.30%	4.00%	4.50%	2.30%	1.30%	1.70%	0.70%	2.00%	0.70%	0.70%	1.90%	4.90%
MA	63	Mass State Area 2 Exempt	15 to 19	500 to 799	4.70%	8.00%	9.10%	2.30%	2.60%	2.60%	1.40%	0.70%	1.30%	2.20%	4.60%	3.70%
MA	63	Mass State Area 2 Exempt	15 to 19	800+	2.30%	8.00%	0.00%	0.00%	1.30%	0.90%	1.40%	2.00%	0.00%	0.00%	0.00%	0.00%
MA	63	Mass State Area 2 Exempt	20+	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	0.00%	0.00%	0.70%	0.70%	0.90%	1.20%
MA	63	Mass State Area 2 Exempt	20+	100 to 299	9.30%	8.00%	9.10%	9.30%	12.80%	5.20%	4.10%	3.90%	2.70%	3.70%	5.60%	8.50%
MA	63	Mass State Area 2 Exempt	20+	300 to 499	7.00%	4.00%	0.00%	9.30%	10.30%	4.30%	4.10%	3.30%	3.40%	5.10%	6.50%	7.30%
MA	63	Mass State Area 2 Exempt	20+	500 to 799	7.00%	8.00%	13.60%	7.00%	9.00%	9.50%	4.10%	4.60%	4.70%	5.90%	7.40%	9.80%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	63	Mass State Area 2 Exempt	20+	800+	16.30%	8.00%	13.60%	16.30%	14.10%	14.70%	14.50%	17.60%	17.40%	17.60%	17.60%	13.40%
MA	64	Mass State Area 3 Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	3.90%	5.90%	6.00%	3.70%	4.10%	2.20%	1.10%	0.00%
MA	64	Mass State Area 3 Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	2.00%	1.20%	3.00%	1.90%	2.00%	2.20%	2.30%	2.00%
MA	64	Mass State Area 3 Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	2.00%	2.40%	2.00%	2.80%	2.00%	2.20%	1.10%	0.00%
MA	64	Mass State Area 3 Exempt	1	800+	5.90%	0.00%	0.00%	0.00%	0.00%	1.20%	0.00%	0.90%	1.00%	1.10%	1.10%	2.00%
MA	64	Mass State Area 3 Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.90%	1.00%	0.00%	0.00%	2.00%
MA	64	Mass State Area 3 Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	2.00%	8.20%	4.00%	3.70%	3.10%	4.30%	2.30%	2.00%
MA	64	Mass State Area 3 Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	5.90%	1.20%	2.00%	1.90%	2.00%	1.10%	0.00%	2.00%
MA	64	Mass State Area 3 Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.00%	1.90%	1.00%	1.10%	1.10%	0.00%
MA	64	Mass State Area 3 Exempt	2	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	64	Mass State Area 3 Exempt	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%
MA	64	Mass State Area 3 Exempt	3	100 to 299	0.00%	0.00%	0.00%	0.00%	7.80%	2.40%	3.00%	2.80%	1.00%	3.20%	4.60%	6.00%
MA	64	Mass State Area 3 Exempt	3	300 to 499	0.00%	0.00%	0.00%	0.00%	2.00%	2.40%	2.00%	1.90%	2.00%	1.10%	1.10%	0.00%
MA	64	Mass State Area 3 Exempt	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%	1.10%	1.10%	0.00%
MA	64	Mass State Area 3 Exempt	6 to 9	0 to 99	5.90%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.90%	1.00%	1.10%	0.00%	0.00%
MA	64	Mass State Area 3 Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	1.00%	0.90%	1.00%	0.00%	0.00%	4.00%
MA	64	Mass State Area 3 Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	2.00%	2.40%	2.00%	2.80%	3.10%	2.20%	4.60%	0.00%
MA	64	Mass State Area 3 Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	2.00%	1.90%	2.00%	2.20%	2.30%	0.00%
MA	64	Mass State Area 3 Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	4.80%	0.00%	1.20%	1.00%	1.90%	0.00%	1.10%	1.10%	0.00%
MA	64	Mass State Area 3 Exempt	10 to 14	100 to 299	0.00%	0.00%	0.00%	4.80%	5.90%	3.50%	4.00%	3.70%	5.10%	4.30%	3.40%	4.00%
MA	64	Mass State Area 3 Exempt	10 to 14	300 to 499	11.80%	0.00%	0.00%	4.80%	2.00%	3.50%	4.00%	5.60%	6.10%	7.50%	5.70%	2.00%
MA	64	Mass State Area 3 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	4.80%	5.90%	4.70%	9.00%	6.50%	10.20%	9.70%	11.50%	16.00%
MA	64	Mass State Area 3 Exempt	10 to 14	800+	0.00%	0.00%	0.00%	4.80%	2.00%	3.50%	3.00%	2.80%	3.10%	3.20%	2.30%	2.00%
MA	64	Mass State Area 3 Exempt	15 to 19	100 to 299	5.90%	14.30%	14.30%	4.80%	2.00%	4.70%	3.00%	2.80%	3.10%	2.20%	1.10%	2.00%
MA	64	Mass State Area 3 Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	4.80%	2.00%	4.70%	4.00%	2.80%	4.10%	4.30%	3.40%	2.00%
MA	64	Mass State Area 3 Exempt	15 to 19	500 to 799	11.80%	14.30%	14.30%	9.50%	3.90%	4.70%	2.00%	4.70%	4.10%	3.20%	2.30%	6.00%
MA	64	Mass State Area 3 Exempt	15 to 19	800+	0.00%	0.00%	0.00%	4.80%	3.90%	4.70%	4.00%	3.70%	3.10%	2.20%	2.30%	4.00%
MA	64	Mass State Area 3 Exempt	20+	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	1.10%	1.10%	2.00%
MA	64	Mass State Area 3 Exempt	20+	100 to 299	23.50%	28.60%	42.90%	23.80%	13.70%	8.20%	7.00%	7.50%	6.10%	9.70%	10.30%	10.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	64	Mass State Area 3 Exempt	20+	300 to 499	5.90%	14.30%	0.00%	9.50%	13.70%	5.90%	8.00%	7.50%	7.10%	6.50%	8.00%	8.00%
MA	64	Mass State Area 3 Exempt	20+	500 to 799	11.80%	0.00%	14.30%	0.00%	0.00%	4.70%	3.00%	1.90%	1.00%	1.10%	3.40%	2.00%
MA	64	Mass State Area 3 Exempt	20+	800+	17.60%	28.60%	14.30%	19.00%	17.60%	12.90%	15.00%	18.70%	17.30%	19.40%	20.70%	20.00%
MA	65	Mass State Area 4 Exempt	1	0 to 99	0.00%	0.00%	10.00%	0.00%	1.80%	3.60%	6.70%	9.00%	6.50%	7.80%	3.30%	1.90%
MA	65	Mass State Area 4 Exempt	1	100 to 299	0.00%	0.00%	0.00%	3.20%	3.60%	3.60%	2.90%	2.70%	1.90%	1.00%	1.10%	1.90%
MA	65	Mass State Area 4 Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.80%	1.90%	0.00%	1.10%	0.00%
MA	65	Mass State Area 4 Exempt	2	100 to 299	0.00%	0.00%	0.00%	3.20%	1.80%	2.40%	1.90%	0.90%	0.90%	1.00%	0.00%	0.00%
MA	65	Mass State Area 4 Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.90%	0.90%	1.00%	0.00%	0.00%
MA	65	Mass State Area 4 Exempt	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%
MA	65	Mass State Area 4 Exempt	3	100 to 299	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	1.00%	1.80%	0.00%	0.00%	1.10%	1.90%
MA	65	Mass State Area 4 Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.00%	0.90%	0.90%	2.00%	1.10%	0.00%
MA	65	Mass State Area 4 Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	3.60%	2.40%	4.80%	1.80%	1.90%	1.00%	1.10%	0.00%
MA	65	Mass State Area 4 Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	3.70%
MA	65	Mass State Area 4 Exempt	6 to 9	500 to 799	6.70%	20.00%	10.00%	3.20%	1.80%	1.20%	1.00%	0.90%	0.90%	1.00%	1.10%	1.90%
MA	65	Mass State Area 4 Exempt	10 to 14	0 to 99	6.70%	0.00%	0.00%	3.20%	0.00%	1.20%	1.90%	1.80%	2.80%	2.00%	3.30%	3.70%
MA	65	Mass State Area 4 Exempt	10 to 14	100 to 299	6.70%	0.00%	10.00%	16.10%	5.50%	6.00%	3.80%	6.30%	7.50%	7.80%	4.40%	9.30%
MA	65	Mass State Area 4 Exempt	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	5.50%	6.00%	2.90%	1.80%	1.90%	1.00%	1.10%	5.60%
MA	65	Mass State Area 4 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	3.20%	7.30%	7.10%	6.70%	9.00%	9.30%	8.80%	7.80%	3.70%
MA	65	Mass State Area 4 Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	1.90%	0.90%	0.90%	1.00%	1.10%	0.00%
MA	65	Mass State Area 4 Exempt	15 to 19	100 to 299	6.70%	20.00%	10.00%	6.50%	1.80%	1.20%	1.90%	1.80%	1.90%	1.00%	2.20%	3.70%
MA	65	Mass State Area 4 Exempt	15 to 19	300 to 499	0.00%	0.00%	10.00%	0.00%	7.30%	6.00%	6.70%	5.40%	6.50%	7.80%	7.80%	3.70%
MA	65	Mass State Area 4 Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	3.20%	7.30%	3.60%	6.70%	5.40%	7.50%	8.80%	8.90%	9.30%
MA	65	Mass State Area 4 Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.80%	3.60%	3.70%	3.90%	4.40%	3.70%
MA	65	Mass State Area 4 Exempt	20+	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%	1.10%	1.90%
MA	65	Mass State Area 4 Exempt	20+	100 to 299	13.30%	0.00%	0.00%	12.90%	7.30%	3.60%	5.80%	8.10%	5.60%	6.90%	5.60%	9.30%
MA	65	Mass State Area 4 Exempt	20+	300 to 499	6.70%	20.00%	10.00%	16.10%	14.50%	11.90%	5.80%	7.20%	9.30%	8.80%	11.10%	11.10%
MA	65	Mass State Area 4 Exempt	20+	500 to 799	26.70%	20.00%	20.00%	19.40%	12.70%	10.70%	8.70%	8.10%	6.50%	6.90%	13.30%	7.40%
MA	65	Mass State Area 4 Exempt	20+	800+	26.70%	20.00%	10.00%	9.70%	18.20%	20.20%	21.20%	19.80%	18.70%	18.60%	17.80%	16.70%
MA	66	Mass State Area 5 Exempt	1	0 to 99	0.00%	0.00%	16.70%	0.00%	3.80%	5.30%	7.40%	9.10%	8.10%	1.70%	5.70%	2.80%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	66	Mass State Area 5 Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	1.90%	3.50%	2.90%	3.00%	3.20%	3.40%	1.90%	5.60%
MA	66	Mass State Area 5 Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.60%	1.70%	1.90%	2.80%
MA	66	Mass State Area 5 Exempt	2	0 to 99	0.00%	0.00%	0.00%	9.10%	0.00%	0.00%	1.50%	0.00%	0.00%	1.70%	1.90%	2.80%
MA	66	Mass State Area 5 Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	3	0 to 99	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	3	100 to 299	0.00%	0.00%	0.00%	0.00%	1.90%	1.80%	1.50%	1.50%	1.60%	1.70%	3.80%	5.60%
MA	66	Mass State Area 5 Exempt	3	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.60%	0.00%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	5.70%	8.80%	5.90%	7.60%	8.10%	3.40%	1.90%	8.30%
MA	66	Mass State Area 5 Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	9.40%	8.80%	7.40%	6.10%	6.50%	5.10%	7.50%	5.60%
MA	66	Mass State Area 5 Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	3.80%	5.30%	1.50%	1.50%	1.60%	1.70%	3.80%	0.00%
MA	66	Mass State Area 5 Exempt	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	1.50%	3.00%	1.60%	1.70%	3.80%	2.80%
MA	66	Mass State Area 5 Exempt	10 to 14	100 to 299	0.00%	0.00%	33.30%	9.10%	9.40%	8.80%	8.80%	6.10%	6.50%	8.50%	7.50%	5.60%
MA	66	Mass State Area 5 Exempt	10 to 14	300 to 499	14.30%	25.00%	0.00%	18.20%	7.50%	8.80%	5.90%	7.60%	9.70%	11.90%	7.50%	8.30%
MA	66	Mass State Area 5 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	3.80%	3.50%	4.40%	6.10%	6.50%	6.80%	3.80%	2.80%
MA	66	Mass State Area 5 Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	5.70%	7.00%	10.30%	9.10%	11.30%	10.20%	5.70%	8.30%
MA	66	Mass State Area 5 Exempt	15 to 19	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	66	Mass State Area 5 Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	9.10%	0.00%	1.80%	2.90%	3.00%	3.20%	3.40%	3.80%	0.00%
MA	66	Mass State Area 5 Exempt	15 to 19	300 to 499	14.30%	0.00%	16.70%	18.20%	1.90%	0.00%	2.90%	3.00%	3.20%	5.10%	5.70%	2.80%
MA	66	Mass State Area 5 Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	3.80%	1.80%	2.90%	1.50%	0.00%	0.00%	3.80%	5.60%
MA	66	Mass State Area 5 Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	1.90%	3.50%	1.50%	1.50%	1.60%	3.40%	1.90%	2.80%
MA	66	Mass State Area 5 Exempt	20+	100 to 299	0.00%	0.00%	0.00%	9.10%	0.00%	1.80%	1.50%	3.00%	3.20%	3.40%	1.90%	8.30%
MA	66	Mass State Area 5 Exempt	20+	300 to 499	14.30%	75.00%	33.30%	0.00%	3.80%	0.00%	1.50%	1.50%	3.20%	1.70%	3.80%	2.80%
MA	66	Mass State Area 5 Exempt	20+	500 to 799	28.60%	0.00%	0.00%	18.20%	13.20%	5.30%	1.50%	3.00%	1.60%	1.70%	7.50%	5.60%
MA	66	Mass State Area 5 Exempt	20+	800+	14.30%	0.00%	0.00%	9.10%	17.00%	22.80%	23.50%	19.70%	16.10%	16.90%	15.10%	11.10%
MA	67	Mass State Area 6 Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	7.50%	4.10%	6.80%	5.50%	3.40%	7.50%	6.80%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	67	Mass State Area 6 Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	2.50%	8.20%	6.80%	7.30%	6.90%	3.80%	2.30%	7.40%
MA	67	Mass State Area 6 Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	3.60%	3.40%	1.90%	2.30%	0.00%
MA	67	Mass State Area 6 Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	1.80%	1.70%	1.90%	2.30%	0.00%
MA	67	Mass State Area 6 Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	1.70%	1.80%	0.00%	1.90%	4.50%	3.70%
MA	67	Mass State Area 6 Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	3.40%	0.00%	0.00%	3.80%	2.30%	0.00%
MA	67	Mass State Area 6 Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
MA	67	Mass State Area 6 Exempt	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	1.70%	0.00%	0.00%	0.00%
MA	67	Mass State Area 6 Exempt	3	100 to 299	0.00%	0.00%	0.00%	0.00%	2.50%	4.10%	3.40%	7.30%	3.40%	5.70%	4.50%	0.00%
MA	67	Mass State Area 6 Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	0.00%	0.00%	3.40%	3.80%	0.00%	3.70%
MA	67	Mass State Area 6 Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	5.10%	5.50%	8.60%	0.00%	0.00%	18.50%
MA	67	Mass State Area 6 Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	7.50%	10.20%	8.50%	9.10%	8.60%	7.50%	9.10%	3.70%
MA	67	Mass State Area 6 Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	5.00%	14.30%	6.80%	7.30%	8.60%	5.70%	11.40%	3.70%
MA	67	Mass State Area 6 Exempt	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	5.00%	4.10%	5.10%	3.60%	3.40%	3.80%	2.30%	3.70%
MA	67	Mass State Area 6 Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	2.50%	0.00%	0.00%	1.80%	0.00%	1.90%	2.30%	0.00%
MA	67	Mass State Area 6 Exempt	10 to 14	100 to 299	50.00%	50.00%	50.00%	50.00%	7.50%	6.10%	5.10%	5.50%	6.90%	5.70%	4.50%	11.10%
MA	67	Mass State Area 6 Exempt	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	12.50%	14.30%	8.50%	7.30%	5.20%	9.40%	6.80%	7.40%
MA	67	Mass State Area 6 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	7.50%	10.20%	11.90%	12.70%	12.10%	13.20%	18.20%	7.40%
MA	67	Mass State Area 6 Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	5.10%	3.60%	6.90%	7.50%	2.30%	3.70%
MA	67	Mass State Area 6 Exempt	15 to 19	300 to 499	50.00%	50.00%	50.00%	50.00%	5.00%	2.00%	3.40%	3.60%	5.20%	5.70%	6.80%	3.70%
MA	67	Mass State Area 6 Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	2.50%	0.00%	1.70%	1.80%	0.00%	1.90%	0.00%	0.00%
MA	67	Mass State Area 6 Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	67	Mass State Area 6 Exempt	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	0.00%	0.00%	0.00%	0.00%	3.70%
MA	67	Mass State Area 6 Exempt	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	5.00%	2.00%	1.70%	0.00%	0.00%	0.00%	2.30%	3.70%
MA	67	Mass State Area 6 Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	1.70%	1.80%	1.70%	1.90%	2.30%	0.00%
MA	67	Mass State Area 6 Exempt	20+	800+	0.00%	0.00%	0.00%	0.00%	5.00%	6.10%	8.50%	9.10%	8.60%	5.70%	6.80%	11.10%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	13.00%	7.80%	8.10%	7.00%	7.90%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	16.70%	14.30%	13.00%	15.60%	16.10%	15.80%	18.40%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	16.70%	9.50%	13.00%	9.40%	9.70%	8.80%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	12.50%	9.50%	3.70%	4.70%	4.80%	5.30%	5.30%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	1	800+	0.00%	0.00%	0.00%	0.00%	4.20%	4.80%	3.70%	3.10%	3.20%	1.80%	0.00%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	0.00%	0.00%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%	0.00%	1.80%	0.00%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	0.00%	1.80%	2.60%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	2	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	1.80%	0.00%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	1.60%	0.00%	0.00%	0.00%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	3	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	3	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	0.00%	1.80%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.70%	1.60%	3.20%	1.80%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	3	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	0.00%	0.00%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	1.60%	1.80%	0.00%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	3.70%	1.60%	1.60%	1.80%	0.00%	18.80%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	1.60%	3.20%	1.80%	2.60%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	5.60%	3.10%	0.00%	1.80%	2.60%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	1.80%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	10 to 14	100 to 299	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	7.40%	7.80%	8.10%	8.80%	5.30%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	4.80%	5.30%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	0.00%	0.00%	0.00%	0.00%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	1.60%	3.20%	1.80%	0.00%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	1.80%	5.30%	0.00%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	20+	100 to 299	100.00%	100.00%	100.00%	100.00%	4.20%	4.80%	3.70%	1.60%	1.60%	0.00%	0.00%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	3.10%	0.00%	1.80%	2.60%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	3.70%	3.10%	3.20%	5.30%	5.30%	6.30%
MA	68	Mass State Area 7 - LMA 1 (0 -3) Exempt	20+	800+	0.00%	0.00%	0.00%	0.00%	4.20%	7.10%	7.40%	9.40%	12.90%	12.30%	15.80%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	13.00%	7.80%	8.10%	7.00%	7.90%	6.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	16.70%	14.30%	13.00%	15.60%	16.10%	15.80%	18.40%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	16.70%	9.50%	13.00%	9.40%	9.70%	8.80%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	12.50%	9.50%	3.70%	4.70%	4.80%	5.30%	5.30%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	1	800+	0.00%	0.00%	0.00%	0.00%	4.20%	4.80%	3.70%	3.10%	3.20%	1.80%	0.00%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	0.00%	0.00%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%	0.00%	1.80%	0.00%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	0.00%	1.80%	2.60%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	2	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	1.80%	0.00%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	1.60%	0.00%	0.00%	0.00%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	3	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	3	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	0.00%	1.80%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.70%	1.60%	3.20%	1.80%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	3	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	0.00%	0.00%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	1.60%	1.80%	0.00%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	3.70%	1.60%	1.60%	1.80%	0.00%	18.80%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	1.60%	3.20%	1.80%	2.60%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	5.60%	3.10%	0.00%	1.80%	2.60%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	1.80%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	10 to 14	100 to 299	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	7.40%	7.80%	8.10%	8.80%	5.30%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	4.80%	5.30%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	0.00%	0.00%	0.00%	0.00%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	1.60%	3.20%	1.80%	0.00%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	1.80%	5.30%	0.00%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	20+	100 to 299	100.00%	100.00%	100.00%	100.00%	4.20%	4.80%	3.70%	1.60%	1.60%	0.00%	0.00%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	3.10%	0.00%	1.80%	2.60%	6.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	3.70%	3.10%	3.20%	5.30%	5.30%	6.30%
MA	69	Mass State Area 7 - LMA 1/OC (0-3) Exempt	20+	800+	0.00%	0.00%	0.00%	0.00%	4.20%	7.10%	7.40%	9.40%	12.90%	12.30%	15.80%	6.30%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	16.70%	16.00%	21.20%	16.70%	12.20%	5.40%	9.10%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	4.80%	4.90%	2.70%	9.10%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	12.00%	6.10%	7.10%	4.90%	5.40%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	2.40%	2.40%	2.70%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	8.30%	0.00%	3.00%	2.40%	0.00%	2.70%	0.00%	4.50%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	8.00%	6.10%	4.80%	4.90%	0.00%	0.00%	4.50%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	3	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	2.40%	2.40%	2.70%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	2.40%	5.40%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	3.00%	2.40%	7.30%	5.40%	0.00%	4.50%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	3.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	10 to 14	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	10 to 14	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	0.00%	0.00%	2.40%	0.00%	6.10%	4.50%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	7.10%	4.90%	5.40%	3.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	4.80%	2.40%	2.70%	3.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	15 to 19	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	3.00%	2.40%	7.30%	8.10%	6.10%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%	0.00%	6.10%	9.10%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	20+	0 to 99	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	20+	100 to 299	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	9.10%	2.40%	2.40%	0.00%	0.00%	4.50%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	20+	300 to 499	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	3.00%	7.10%	2.40%	5.40%	9.10%	13.60%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	4.80%	4.90%	5.40%	6.10%	18.20%
MA	70	Mass State Area 8 - LMA 1 (0-3) Exempt	20+	800+	12.50%	12.50%	12.50%	12.50%	16.70%	16.00%	18.20%	26.20%	29.30%	35.10%	36.40%	31.80%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	16.70%	16.00%	21.20%	16.70%	12.20%	5.40%	9.10%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	4.80%	4.90%	2.70%	9.10%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	12.00%	6.10%	7.10%	4.90%	5.40%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	2.40%	2.40%	2.70%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	8.30%	0.00%	3.00%	2.40%	0.00%	2.70%	0.00%	4.50%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	8.00%	6.10%	4.80%	4.90%	0.00%	0.00%	4.50%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	3	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	2.40%	2.40%	2.70%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	2.40%	5.40%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	3.00%	2.40%	7.30%	5.40%	0.00%	4.50%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	3.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	10 to 14	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	10 to 14	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	0.00%	0.00%	2.40%	0.00%	6.10%	4.50%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	7.10%	4.90%	5.40%	3.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	4.80%	2.40%	2.70%	3.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	15 to 19	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	3.00%	2.40%	7.30%	8.10%	6.10%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%	0.00%	6.10%	9.10%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	20+	0 to 99	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	20+	100 to 299	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	9.10%	2.40%	2.40%	0.00%	0.00%	4.50%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	20+	300 to 499	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	3.00%	7.10%	2.40%	5.40%	9.10%	13.60%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	4.80%	4.90%	5.40%	6.10%	18.20%
MA	71	Mass State Area 8 - LMA 1/OC (0-3) Exempt	20+	800+	12.50%	12.50%	12.50%	12.50%	16.70%	16.00%	18.20%	26.20%	29.30%	35.10%	36.40%	31.80%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	16.70%	16.00%	21.20%	16.70%	12.20%	5.40%	9.10%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	4.80%	4.90%	2.70%	9.10%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	12.00%	6.10%	7.10%	4.90%	5.40%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	2.40%	2.40%	2.70%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	8.30%	0.00%	3.00%	2.40%	0.00%	2.70%	0.00%	4.50%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	2	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	8.00%	6.10%	4.80%	4.90%	0.00%	0.00%	4.50%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	3	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	2.40%	2.40%	2.70%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	2.40%	5.40%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	3.00%	2.40%	7.30%	5.40%	0.00%	4.50%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	3.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	10 to 14	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	10 to 14	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	0.00%	0.00%	2.40%	0.00%	6.10%	4.50%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	7.10%	4.90%	5.40%	3.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	4.80%	2.40%	2.70%	3.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	15 to 19	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	3.00%	2.40%	7.30%	8.10%	6.10%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%	0.00%	6.10%	9.10%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	20+	0 to 99	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	20+	100 to 299	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	9.10%	2.40%	2.40%	0.00%	0.00%	4.50%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	20+	300 to 499	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	3.00%	7.10%	2.40%	5.40%	9.10%	13.60%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	4.80%	4.90%	5.40%	6.10%	18.20%
MA	72	Mass State Area 8 - LMA OC (0-3) Exempt	20+	800+	12.50%	12.50%	12.50%	12.50%	16.70%	16.00%	18.20%	26.20%	29.30%	35.10%	36.40%	31.80%
MA	73	Mass State Area 9 Exempt	1	0 to 99	13.30%	13.30%	13.30%	13.30%	13.30%	14.30%	14.30%	15.90%	10.80%	9.70%	40.90%	50.00%
MA	73	Mass State Area 9 Exempt	1	100 to 299	46.70%	46.70%	46.70%	46.70%	46.70%	17.10%	19.00%	15.90%	13.50%	19.40%	27.30%	25.00%
MA	73	Mass State Area 9 Exempt	1	300 to 499	20.00%	20.00%	20.00%	20.00%	20.00%	25.70%	19.00%	18.20%	27.00%	25.80%	4.50%	0.00%
MA	73	Mass State Area 9 Exempt	1	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	8.60%	7.10%	9.10%	8.10%	6.50%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.70%	4.50%	0.00%
MA	73	Mass State Area 9 Exempt	2	500 to 799	6.70%	6.70%	6.70%	6.70%	6.70%	8.60%	9.50%	9.10%	8.10%	0.00%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	3.20%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	73	Mass State Area 9 Exempt	3	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.30%	2.70%	3.20%	4.50%	0.00%
MA	73	Mass State Area 9 Exempt	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	0.00%
MA	73	Mass State Area 9 Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	5.70%	2.40%	4.50%	5.40%	3.20%	4.50%	0.00%
MA	73	Mass State Area 9 Exempt	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.90%	2.40%	2.30%	2.70%	3.20%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	10 to 14	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%	25.00%
MA	73	Mass State Area 9 Exempt	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	5.70%	4.80%	4.50%	5.40%	3.20%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	3.20%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	2.30%	2.70%	3.20%	4.50%	0.00%
MA	73	Mass State Area 9 Exempt	20+	100 to 299	6.70%	6.70%	6.70%	6.70%	6.70%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	20+	300 to 499	6.70%	6.70%	6.70%	6.70%	6.70%	0.00%	0.00%	0.00%	2.70%	3.20%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	11.40%	9.50%	11.40%	2.70%	0.00%	0.00%	0.00%
MA	73	Mass State Area 9 Exempt	20+	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	4.50%	5.40%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	1	0 to 99	20.00%	0.00%	0.00%	10.00%	7.70%	21.40%	17.60%	15.40%	10.00%	25.00%	33.30%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.80%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	3	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	25.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	3	100 to 299	0.00%	25.00%	0.00%	0.00%	7.70%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	6 to 9	0 to 99	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	6 to 9	100 to 299	0.00%	25.00%	0.00%	0.00%	15.40%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	10 to 14	100 to 299	20.00%	0.00%	20.00%	20.00%	15.40%	7.10%	5.90%	7.70%	0.00%	25.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	10 to 14	300 to 499	0.00%	25.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	15 to 19	100 to 299	20.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	10.00%	15.40%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	20+	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	20+	100 to 299	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	17.60%	15.40%	10.00%	0.00%	0.00%	25.00%
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	20+	300 to 499	20.00%	25.00%	20.00%	20.00%	23.10%	21.40%	23.50%	23.10%	30.00%	0.00%	0.00%	25.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	74	Mass State Area 10 - LMA 2 (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	20.00%	15.40%	21.40%	23.50%	23.10%	10.00%	25.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	1	0 to 99	20.00%	0.00%	0.00%	10.00%	7.70%	21.40%	17.60%	15.40%	10.00%	25.00%	33.30%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.80%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	3	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	25.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	3	100 to 299	0.00%	25.00%	0.00%	0.00%	7.70%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	6 to 9	0 to 99	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	6 to 9	100 to 299	0.00%	25.00%	0.00%	0.00%	15.40%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	10 to 14	100 to 299	20.00%	0.00%	20.00%	20.00%	15.40%	7.10%	5.90%	7.70%	0.00%	25.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	10 to 14	300 to 499	0.00%	25.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	15 to 19	100 to 299	20.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	10.00%	15.40%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	20+	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	20+	100 to 299	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	17.60%	15.40%	10.00%	0.00%	0.00%	25.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	20+	300 to 499	20.00%	25.00%	20.00%	20.00%	23.10%	21.40%	23.50%	23.10%	30.00%	0.00%	0.00%	25.00%
MA	75	Mass State Area 10 - LMA OC (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	20.00%	15.40%	21.40%	23.50%	23.10%	10.00%	25.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	1	0 to 99	20.00%	0.00%	0.00%	10.00%	7.70%	21.40%	17.60%	15.40%	10.00%	25.00%	33.30%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.80%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	3	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	25.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	3	100 to 299	0.00%	25.00%	0.00%	0.00%	7.70%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	6 to 9	0 to 99	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	6 to 9	100 to 299	0.00%	25.00%	0.00%	0.00%	15.40%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	10 to 14	100 to 299	20.00%	0.00%	20.00%	20.00%	15.40%	7.10%	5.90%	7.70%	0.00%	25.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	10 to 14	300 to 499	0.00%	25.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	15 to 19	100 to 299	20.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	10.00%	15.40%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	20+	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	20+	100 to 299	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	17.60%	15.40%	10.00%	0.00%	0.00%	25.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	20+	300 to 499	20.00%	25.00%	20.00%	20.00%	23.10%	21.40%	23.50%	23.10%	30.00%	0.00%	0.00%	25.00%
MA	76	Mass State Area 11 - LMA 2 (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	20.00%	15.40%	21.40%	23.50%	23.10%	10.00%	25.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	1	0 to 99	20.00%	0.00%	0.00%	10.00%	7.70%	21.40%	17.60%	15.40%	10.00%	25.00%	33.30%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	2	0 to 99	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.80%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	3	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	25.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	3	100 to 299	0.00%	25.00%	0.00%	0.00%	7.70%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	6 to 9	0 to 99	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	6 to 9	100 to 299	0.00%	25.00%	0.00%	0.00%	15.40%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	10 to 14	100 to 299	20.00%	0.00%	20.00%	20.00%	15.40%	7.10%	5.90%	7.70%	0.00%	25.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	10 to 14	300 to 499	0.00%	25.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	15 to 19	100 to 299	20.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	10.00%	15.40%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	20+	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	20+	100 to 299	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	17.60%	15.40%	10.00%	0.00%	0.00%	25.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	20+	300 to 499	20.00%	25.00%	20.00%	20.00%	23.10%	21.40%	23.50%	23.10%	30.00%	0.00%	0.00%	25.00%
MA	77	Mass State Area 11 - LMA OC (0-3) Exempt	20+	500 to 799	0.00%	0.00%	0.00%	20.00%	15.40%	21.40%	23.50%	23.10%	10.00%	25.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	1	0 to 99	20.00%	0.00%	0.00%	10.00%	7.70%	21.40%	17.60%	15.40%	10.00%	25.00%	33.30%	0.00%
MA	78	Mass State Area 12 Exempt	1	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	2	0 to 99	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	2	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.80%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	3	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	25.00%
MA	78	Mass State Area 12 Exempt	3	100 to 299	0.00%	25.00%	0.00%	0.00%	7.70%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	78	Mass State Area 12 Exempt	6 to 9	0 to 99	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.00%
MA	78	Mass State Area 12 Exempt	6 to 9	100 to 299	0.00%	25.00%	0.00%	0.00%	15.40%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	0.00%
MA	78	Mass State Area 12 Exempt	10 to 14	100 to 299	20.00%	0.00%	20.00%	20.00%	15.40%	7.10%	5.90%	7.70%	0.00%	25.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	10 to 14	300 to 499	0.00%	25.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	15 to 19	100 to 299	20.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	15 to 19	300 to 499	0.00%	0.00%	0.00%	10.00%	15.40%	7.10%	0.00%	7.70%	0.00%	0.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	20+	0 to 99	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	78	Mass State Area 12 Exempt	20+	100 to 299	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	17.60%	15.40%	10.00%	0.00%	0.00%	25.00%
MA	78	Mass State Area 12 Exempt	20+	300 to 499	20.00%	25.00%	20.00%	20.00%	23.10%	21.40%	23.50%	23.10%	30.00%	0.00%	0.00%	25.00%
MA	78	Mass State Area 12 Exempt	20+	500 to 799	0.00%	0.00%	0.00%	20.00%	15.40%	21.40%	23.50%	23.10%	10.00%	25.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	1	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	11.10%	21.10%	18.80%	16.70%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	1	100 to 299	0.00%	0.00%	0.00%	10.00%	20.00%	22.20%	10.50%	12.50%	0.00%	20.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	1	300 to 499	0.00%	0.00%	0.00%	10.00%	10.00%	5.60%	5.30%	6.30%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	2	0 to 99	0.00%	0.00%	12.50%	10.00%	0.00%	0.00%	0.00%	0.00%	16.70%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	2	100 to 299	0.00%	20.00%	0.00%	0.00%	20.00%	11.10%	21.10%	12.50%	16.70%	0.00%	0.00%	16.70%
MA	79	Mass State Area 13 Exempt	2	300 to 499	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	3	0 to 99	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	33.30%	16.70%
MA	79	Mass State Area 13 Exempt	3	100 to 299	25.00%	0.00%	0.00%	0.00%	10.00%	5.60%	0.00%	6.30%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	6 to 9	0 to 99	0.00%	40.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.70%
MA	79	Mass State Area 13 Exempt	6 to 9	100 to 299	25.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	10.00%	10.00%	5.60%	5.30%	6.30%	0.00%	20.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	10 to 14	100 to 299	0.00%	0.00%	12.50%	10.00%	10.00%	5.60%	5.30%	6.30%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	10 to 14	300 to 499	0.00%	20.00%	25.00%	10.00%	10.00%	5.60%	5.30%	6.30%	16.70%	20.00%	66.70%	33.30%
MA	79	Mass State Area 13 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.30%	16.70%	20.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	15 to 19	100 to 299	25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	20+	0 to 99	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	20+	100 to 299	0.00%	0.00%	0.00%	10.00%	0.00%	5.60%	5.30%	6.30%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	20+	300 to 499	25.00%	20.00%	12.50%	10.00%	10.00%	11.10%	10.50%	12.50%	16.70%	0.00%	0.00%	16.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	79	Mass State Area 13 Exempt	20+	500 to 799	0.00%	0.00%	0.00%	10.00%	0.00%	5.60%	10.50%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	79	Mass State Area 13 Exempt	20+	800+	0.00%	0.00%	0.00%	0.00%	0.00%	5.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	1	0 to 99	20.00%	25.00%	25.00%	25.00%	23.10%	15.80%	15.80%	14.30%	12.50%	0.00%	0.00%	16.70%
MA	80	Mass State Area 14 Exempt	1	100 to 299	0.00%	0.00%	0.00%	16.70%	23.10%	31.60%	31.60%	28.60%	25.00%	25.00%	0.00%	16.70%
MA	80	Mass State Area 14 Exempt	1	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	16.70%
MA	80	Mass State Area 14 Exempt	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	2	100 to 299	20.00%	50.00%	25.00%	0.00%	7.70%	5.30%	0.00%	7.10%	12.50%	25.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	0.00%	12.50%	0.00%	33.30%	16.70%
MA	80	Mass State Area 14 Exempt	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	5.30%	5.30%	7.10%	12.50%	25.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	3	100 to 299	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	3	500 to 799	0.00%	0.00%	0.00%	0.00%	7.70%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	6 to 9	100 to 299	0.00%	0.00%	0.00%	8.30%	0.00%	5.30%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	6 to 9	300 to 499	0.00%	0.00%	0.00%	16.70%	15.40%	10.50%	10.50%	7.10%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	10 to 14	100 to 299	0.00%	0.00%	25.00%	8.30%	7.70%	5.30%	5.30%	14.30%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	33.30%	16.70%
MA	80	Mass State Area 14 Exempt	10 to 14	500 to 799	0.00%	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	15 to 19	100 to 299	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.70%
MA	80	Mass State Area 14 Exempt	15 to 19	300 to 499	20.00%	25.00%	25.00%	0.00%	7.70%	5.30%	5.30%	14.30%	12.50%	25.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	20+	300 to 499	0.00%	0.00%	0.00%	8.30%	0.00%	5.30%	0.00%	7.10%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	20+	500 to 799	0.00%	0.00%	0.00%	8.30%	0.00%	5.30%	5.30%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	80	Mass State Area 14 Exempt	20+	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%	0.00%	0.00%
MA	81	Mass State Area 2	2	0 to 99	4.70%	0.00%	0.00%	2.30%	3.80%	8.60%	11.70%	12.40%	11.40%	11.00%	5.60%	4.90%
MA	81	Mass State Area 2	2	100 to 299	2.30%	0.00%	0.00%	9.30%	10.30%	6.90%	7.60%	6.50%	7.40%	7.40%	4.60%	4.90%
MA	81	Mass State Area 2	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.40%	1.30%	0.70%	0.70%	0.90%	0.00%
MA	81	Mass State Area 2	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.70%	0.70%	0.00%	0.00%
MA	81	Mass State Area 2	2	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	81	Mass State Area 2	3	0 to 99	0.00%	4.00%	4.50%	2.30%	2.60%	1.70%	2.80%	3.30%	3.40%	2.90%	1.90%	0.00%
MA	81	Mass State Area 2	3	100 to 299	4.70%	4.00%	0.00%	2.30%	1.30%	3.40%	3.40%	3.90%	5.40%	2.90%	4.60%	7.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	81	Mass State Area 2	3	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	3.40%	2.80%	2.00%	2.00%	2.20%	1.90%	1.20%
MA	81	Mass State Area 2	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.00%
MA	81	Mass State Area 2	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.40%	2.00%	2.00%	2.20%	0.90%	1.20%
MA	81	Mass State Area 2	6 to 9	100 to 299	7.00%	4.00%	13.60%	4.70%	3.80%	4.30%	3.40%	2.00%	2.00%	2.20%	1.90%	4.90%
MA	81	Mass State Area 2	6 to 9	300 to 499	2.30%	4.00%	4.50%	7.00%	2.60%	1.70%	1.40%	0.70%	0.00%	0.00%	0.90%	2.40%
MA	81	Mass State Area 2	6 to 9	500 to 799	9.30%	4.00%	4.50%	2.30%	5.10%	0.90%	1.40%	1.30%	1.30%	1.50%	2.80%	1.20%
MA	81	Mass State Area 2	10 to 14	0 to 99	4.70%	4.00%	0.00%	2.30%	0.00%	0.00%	0.00%	0.70%	0.00%	0.00%	0.90%	0.00%
MA	81	Mass State Area 2	10 to 14	100 to 299	14.00%	24.00%	18.20%	14.00%	7.70%	3.40%	2.80%	2.00%	2.70%	2.90%	3.70%	3.70%
MA	81	Mass State Area 2	10 to 14	300 to 499	2.30%	0.00%	0.00%	2.30%	5.10%	7.80%	9.00%	9.20%	11.40%	8.80%	9.30%	4.90%
MA	81	Mass State Area 2	10 to 14	500 to 799	0.00%	4.00%	4.50%	2.30%	3.80%	7.80%	8.30%	9.20%	8.70%	10.30%	8.30%	8.50%
MA	81	Mass State Area 2	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	2.60%	6.90%	9.00%	6.50%	6.70%	5.90%	6.50%	6.10%
MA	81	Mass State Area 2	15 to 19	100 to 299	0.00%	0.00%	0.00%	2.30%	0.00%	2.60%	2.80%	2.60%	2.70%	2.20%	0.90%	0.00%
MA	81	Mass State Area 2	15 to 19	300 to 499	2.30%	4.00%	4.50%	2.30%	1.30%	1.70%	0.70%	2.00%	0.70%	0.70%	1.90%	4.90%
MA	81	Mass State Area 2	15 to 19	500 to 799	4.70%	8.00%	9.10%	2.30%	2.60%	2.60%	1.40%	0.70%	1.30%	2.20%	4.60%	3.70%
MA	81	Mass State Area 2	15 to 19	800+	2.30%	8.00%	0.00%	0.00%	1.30%	0.90%	1.40%	2.00%	0.00%	0.00%	0.00%	0.00%
MA	81	Mass State Area 2	20+	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	0.00%	0.00%	0.70%	0.70%	0.90%	1.20%
MA	81	Mass State Area 2	20+	100 to 299	9.30%	8.00%	9.10%	9.30%	12.80%	5.20%	4.10%	3.90%	2.70%	3.70%	5.60%	8.50%
MA	81	Mass State Area 2	20+	300 to 499	7.00%	4.00%	0.00%	9.30%	10.30%	4.30%	4.10%	3.30%	3.40%	5.10%	6.50%	7.30%
MA	81	Mass State Area 2	20+	500 to 799	7.00%	8.00%	13.60%	7.00%	9.00%	9.50%	4.10%	4.60%	4.70%	5.90%	7.40%	9.80%
MA	81	Mass State Area 2	20+	800+	16.30%	8.00%	13.60%	16.30%	14.10%	14.70%	14.50%	17.60%	17.40%	17.60%	17.60%	13.40%
MA	82	Mass State Area 3	2	0 to 99	0.00%	0.00%	0.00%	0.00%	3.90%	5.90%	7.00%	4.70%	5.10%	2.20%	1.10%	2.00%
MA	82	Mass State Area 3	2	100 to 299	0.00%	0.00%	0.00%	0.00%	3.90%	9.40%	7.00%	5.60%	5.10%	6.50%	4.60%	4.00%
MA	82	Mass State Area 3	2	300 to 499	0.00%	0.00%	0.00%	0.00%	7.80%	3.50%	4.00%	4.70%	4.10%	3.20%	1.10%	2.00%
MA	82	Mass State Area 3	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.00%	1.90%	1.00%	1.10%	1.10%	0.00%
MA	82	Mass State Area 3	2	800+	5.90%	0.00%	0.00%	0.00%	0.00%	1.20%	1.00%	0.90%	1.00%	1.10%	1.10%	2.00%
MA	82	Mass State Area 3	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%
MA	82	Mass State Area 3	3	100 to 299	0.00%	0.00%	0.00%	0.00%	7.80%	2.40%	3.00%	2.80%	1.00%	3.20%	4.60%	6.00%
MA	82	Mass State Area 3	3	300 to 499	0.00%	0.00%	0.00%	0.00%	2.00%	2.40%	2.00%	1.90%	2.00%	1.10%	1.10%	0.00%
MA	82	Mass State Area 3	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%	1.10%	1.10%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	82	Mass State Area 3	6 to 9	0 to 99	5.90%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.90%	1.00%	1.10%	0.00%	0.00%
MA	82	Mass State Area 3	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	1.00%	0.90%	1.00%	0.00%	0.00%	4.00%
MA	82	Mass State Area 3	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	2.00%	2.40%	2.00%	2.80%	3.10%	2.20%	4.60%	0.00%
MA	82	Mass State Area 3	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	2.00%	1.90%	2.00%	2.20%	2.30%	0.00%
MA	82	Mass State Area 3	10 to 14	0 to 99	0.00%	0.00%	0.00%	4.80%	0.00%	1.20%	1.00%	1.90%	0.00%	1.10%	1.10%	0.00%
MA	82	Mass State Area 3	10 to 14	100 to 299	0.00%	0.00%	0.00%	4.80%	5.90%	3.50%	4.00%	3.70%	5.10%	4.30%	3.40%	4.00%
MA	82	Mass State Area 3	10 to 14	300 to 499	11.80%	0.00%	0.00%	4.80%	2.00%	3.50%	4.00%	5.60%	6.10%	7.50%	5.70%	2.00%
MA	82	Mass State Area 3	10 to 14	500 to 799	0.00%	0.00%	0.00%	4.80%	5.90%	4.70%	9.00%	6.50%	10.20%	9.70%	11.50%	16.00%
MA	82	Mass State Area 3	10 to 14	800+	0.00%	0.00%	0.00%	4.80%	2.00%	3.50%	3.00%	2.80%	3.10%	3.20%	2.30%	2.00%
MA	82	Mass State Area 3	15 to 19	100 to 299	5.90%	14.30%	14.30%	4.80%	2.00%	4.70%	3.00%	2.80%	3.10%	2.20%	1.10%	2.00%
MA	82	Mass State Area 3	15 to 19	300 to 499	0.00%	0.00%	0.00%	4.80%	2.00%	4.70%	4.00%	2.80%	4.10%	4.30%	3.40%	2.00%
MA	82	Mass State Area 3	15 to 19	500 to 799	11.80%	14.30%	14.30%	9.50%	3.90%	4.70%	2.00%	4.70%	4.10%	3.20%	2.30%	6.00%
MA	82	Mass State Area 3	15 to 19	800+	0.00%	0.00%	0.00%	4.80%	3.90%	4.70%	4.00%	3.70%	3.10%	2.20%	2.30%	4.00%
MA	82	Mass State Area 3	20+	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	1.10%	1.10%	2.00%
MA	82	Mass State Area 3	20+	100 to 299	23.50%	28.60%	42.90%	23.80%	13.70%	8.20%	7.00%	7.50%	6.10%	9.70%	10.30%	10.00%
MA	82	Mass State Area 3	20+	300 to 499	5.90%	14.30%	0.00%	9.50%	13.70%	5.90%	8.00%	7.50%	7.10%	6.50%	8.00%	8.00%
MA	82	Mass State Area 3	20+	500 to 799	11.80%	0.00%	14.30%	0.00%	0.00%	4.70%	3.00%	1.90%	1.00%	1.10%	3.40%	2.00%
MA	82	Mass State Area 3	20+	800+	17.60%	28.60%	14.30%	19.00%	17.60%	12.90%	15.00%	18.70%	17.30%	19.40%	20.70%	20.00%
MA	83	Mass State Area 4	2	0 to 99	0.00%	0.00%	10.00%	0.00%	1.80%	6.00%	8.70%	10.80%	8.40%	7.80%	4.40%	1.90%
MA	83	Mass State Area 4	2	100 to 299	0.00%	0.00%	0.00%	6.50%	5.50%	6.00%	4.80%	3.60%	2.80%	2.00%	1.10%	1.90%
MA	83	Mass State Area 4	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.90%	0.90%	1.00%	0.00%	0.00%
MA	83	Mass State Area 4	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	0.00%	0.00%	0.90%	0.00%	0.00%	0.00%
MA	83	Mass State Area 4	3	100 to 299	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	1.00%	1.80%	0.00%	0.00%	1.10%	1.90%
MA	83	Mass State Area 4	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.00%	0.90%	0.90%	2.00%	1.10%	0.00%
MA	83	Mass State Area 4	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	3.60%	2.40%	4.80%	1.80%	1.90%	1.00%	1.10%	0.00%
MA	83	Mass State Area 4	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	3.70%
MA	83	Mass State Area 4	6 to 9	500 to 799	6.70%	20.00%	10.00%	3.20%	1.80%	1.20%	1.00%	0.90%	0.90%	1.00%	1.10%	1.90%
MA	83	Mass State Area 4	10 to 14	0 to 99	6.70%	0.00%	0.00%	3.20%	0.00%	1.20%	1.90%	1.80%	2.80%	2.00%	3.30%	3.70%
MA	83	Mass State Area 4	10 to 14	100 to 299	6.70%	0.00%	10.00%	16.10%	5.50%	6.00%	3.80%	6.30%	7.50%	7.80%	4.40%	9.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	83	Mass State Area 4	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	5.50%	6.00%	2.90%	1.80%	1.90%	1.00%	1.10%	5.60%
MA	83	Mass State Area 4	10 to 14	500 to 799	0.00%	0.00%	0.00%	3.20%	7.30%	7.10%	6.70%	9.00%	9.30%	8.80%	7.80%	3.70%
MA	83	Mass State Area 4	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	0.00%	1.20%	1.90%	0.90%	0.90%	1.00%	1.10%	0.00%
MA	83	Mass State Area 4	15 to 19	100 to 299	6.70%	20.00%	10.00%	6.50%	1.80%	1.20%	1.90%	1.80%	1.90%	1.00%	2.20%	3.70%
MA	83	Mass State Area 4	15 to 19	300 to 499	0.00%	0.00%	10.00%	0.00%	7.30%	6.00%	6.70%	5.40%	6.50%	7.80%	7.80%	3.70%
MA	83	Mass State Area 4	15 to 19	500 to 799	0.00%	0.00%	0.00%	3.20%	7.30%	3.60%	6.70%	5.40%	7.50%	8.80%	8.90%	9.30%
MA	83	Mass State Area 4	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.80%	3.60%	3.70%	3.90%	4.40%	3.70%
MA	83	Mass State Area 4	20+	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%	1.10%	1.90%
MA	83	Mass State Area 4	20+	100 to 299	13.30%	0.00%	0.00%	12.90%	7.30%	3.60%	5.80%	8.10%	5.60%	6.90%	5.60%	9.30%
MA	83	Mass State Area 4	20+	300 to 499	6.70%	20.00%	10.00%	16.10%	14.50%	11.90%	5.80%	7.20%	9.30%	8.80%	11.10%	11.10%
MA	83	Mass State Area 4	20+	500 to 799	26.70%	20.00%	20.00%	19.40%	12.70%	10.70%	8.70%	8.10%	6.50%	6.90%	13.30%	7.40%
MA	83	Mass State Area 4	20+	800+	26.70%	20.00%	10.00%	9.70%	18.20%	20.20%	21.20%	19.80%	18.70%	18.60%	17.80%	16.70%
MA	84	Mass State Area 5	2	0 to 99	0.00%	0.00%	16.70%	9.10%	3.80%	5.30%	8.80%	9.10%	8.10%	3.40%	7.50%	5.60%
MA	84	Mass State Area 5	2	100 to 299	0.00%	0.00%	0.00%	0.00%	3.80%	3.50%	2.90%	3.00%	3.20%	3.40%	1.90%	5.60%
MA	84	Mass State Area 5	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.50%	1.60%	1.70%	1.90%	2.80%
MA	84	Mass State Area 5	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	0.00%	0.00%
MA	84	Mass State Area 5	3	0 to 99	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	84	Mass State Area 5	3	100 to 299	0.00%	0.00%	0.00%	0.00%	1.90%	1.80%	1.50%	1.50%	1.60%	1.70%	3.80%	5.60%
MA	84	Mass State Area 5	3	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	1.60%	0.00%	0.00%	0.00%
MA	84	Mass State Area 5	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	0.00%	3.40%	0.00%	0.00%
MA	84	Mass State Area 5	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	5.70%	8.80%	5.90%	7.60%	8.10%	3.40%	1.90%	8.30%
MA	84	Mass State Area 5	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	9.40%	8.80%	7.40%	6.10%	6.50%	5.10%	7.50%	5.60%
MA	84	Mass State Area 5	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	3.80%	5.30%	1.50%	1.50%	1.60%	1.70%	3.80%	0.00%
MA	84	Mass State Area 5	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	84	Mass State Area 5	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	1.50%	3.00%	1.60%	1.70%	3.80%	2.80%
MA	84	Mass State Area 5	10 to 14	100 to 299	0.00%	0.00%	33.30%	9.10%	9.40%	8.80%	8.80%	6.10%	6.50%	8.50%	7.50%	5.60%
MA	84	Mass State Area 5	10 to 14	300 to 499	14.30%	25.00%	0.00%	18.20%	7.50%	8.80%	5.90%	7.60%	9.70%	11.90%	7.50%	8.30%
MA	84	Mass State Area 5	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	3.80%	3.50%	4.40%	6.10%	6.50%	6.80%	3.80%	2.80%
MA	84	Mass State Area 5	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	5.70%	7.00%	10.30%	9.10%	11.30%	10.20%	5.70%	8.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	84	Mass State Area 5	15 to 19	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	1.80%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	84	Mass State Area 5	15 to 19	100 to 299	0.00%	0.00%	0.00%	9.10%	0.00%	1.80%	2.90%	3.00%	3.20%	3.40%	3.80%	0.00%
MA	84	Mass State Area 5	15 to 19	300 to 499	14.30%	0.00%	16.70%	18.20%	1.90%	0.00%	2.90%	3.00%	3.20%	5.10%	5.70%	2.80%
MA	84	Mass State Area 5	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	3.80%	1.80%	2.90%	1.50%	0.00%	0.00%	3.80%	5.60%
MA	84	Mass State Area 5	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	1.90%	3.50%	1.50%	1.50%	1.60%	3.40%	1.90%	2.80%
MA	84	Mass State Area 5	20+	100 to 299	0.00%	0.00%	0.00%	9.10%	0.00%	1.80%	1.50%	3.00%	3.20%	3.40%	1.90%	8.30%
MA	84	Mass State Area 5	20+	300 to 499	14.30%	75.00%	33.30%	0.00%	3.80%	0.00%	1.50%	1.50%	3.20%	1.70%	3.80%	2.80%
MA	84	Mass State Area 5	20+	500 to 799	28.60%	0.00%	0.00%	18.20%	13.20%	5.30%	1.50%	3.00%	1.60%	1.70%	7.50%	5.60%
MA	84	Mass State Area 5	20+	800+	14.30%	0.00%	0.00%	9.10%	17.00%	22.80%	23.50%	19.70%	16.10%	16.90%	15.10%	11.10%
MA	85	Mass State Area 6	2	0 to 99	0.00%	0.00%	0.00%	0.00%	10.00%	6.10%	8.50%	7.30%	3.40%	9.40%	11.40%	3.70%
MA	85	Mass State Area 6	2	100 to 299	0.00%	0.00%	0.00%	0.00%	5.00%	10.20%	10.20%	7.30%	6.90%	7.50%	4.50%	7.40%
MA	85	Mass State Area 6	2	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	3.60%	3.40%	1.90%	2.30%	3.70%
MA	85	Mass State Area 6	2	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	1.80%	1.70%	1.90%	2.30%	0.00%
MA	85	Mass State Area 6	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	0.00%	0.00%	1.70%	0.00%	0.00%	0.00%
MA	85	Mass State Area 6	3	100 to 299	0.00%	0.00%	0.00%	0.00%	2.50%	4.10%	3.40%	7.30%	3.40%	5.70%	4.50%	0.00%
MA	85	Mass State Area 6	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	0.00%	0.00%	3.40%	3.80%	0.00%	3.70%
MA	85	Mass State Area 6	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	2.00%	5.10%	5.50%	8.60%	0.00%	0.00%	18.50%
MA	85	Mass State Area 6	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	7.50%	10.20%	8.50%	9.10%	8.60%	7.50%	9.10%	3.70%
MA	85	Mass State Area 6	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	5.00%	14.30%	6.80%	7.30%	8.60%	5.70%	11.40%	3.70%
MA	85	Mass State Area 6	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	5.00%	4.10%	5.10%	3.60%	3.40%	3.80%	2.30%	3.70%
MA	85	Mass State Area 6	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	2.50%	0.00%	0.00%	1.80%	0.00%	1.90%	2.30%	0.00%
MA	85	Mass State Area 6	10 to 14	100 to 299	50.00%	50.00%	50.00%	50.00%	7.50%	6.10%	5.10%	5.50%	6.90%	5.70%	4.50%	11.10%
MA	85	Mass State Area 6	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	12.50%	14.30%	8.50%	7.30%	5.20%	9.40%	6.80%	7.40%
MA	85	Mass State Area 6	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	7.50%	10.20%	11.90%	12.70%	12.10%	13.20%	18.20%	7.40%
MA	85	Mass State Area 6	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	5.10%	3.60%	6.90%	7.50%	2.30%	3.70%
MA	85	Mass State Area 6	15 to 19	300 to 499	50.00%	50.00%	50.00%	50.00%	5.00%	2.00%	3.40%	3.60%	5.20%	5.70%	6.80%	3.70%
MA	85	Mass State Area 6	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	2.50%	0.00%	1.70%	1.80%	0.00%	1.90%	0.00%	0.00%
MA	85	Mass State Area 6	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	2.50%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	85	Mass State Area 6	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	0.00%	0.00%	0.00%	0.00%	3.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	85	Mass State Area 6	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	5.00%	2.00%	1.70%	0.00%	0.00%	0.00%	2.30%	3.70%
MA	85	Mass State Area 6	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	1.70%	1.80%	1.70%	1.90%	2.30%	0.00%
MA	85	Mass State Area 6	20+	800+	0.00%	0.00%	0.00%	0.00%	5.00%	6.10%	8.50%	9.10%	8.60%	5.70%	6.80%	11.10%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	9.50%	14.80%	9.40%	9.70%	7.00%	7.90%	12.50%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	2	100 to 299	0.00%	0.00%	0.00%	0.00%	16.70%	14.30%	13.00%	18.80%	16.10%	17.50%	18.40%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	2	300 to 499	0.00%	0.00%	0.00%	0.00%	16.70%	9.50%	13.00%	9.40%	9.70%	8.80%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	2	500 to 799	0.00%	0.00%	0.00%	0.00%	12.50%	11.90%	5.60%	6.30%	4.80%	7.00%	7.90%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	2	800+	0.00%	0.00%	0.00%	0.00%	4.20%	7.10%	5.60%	4.70%	4.80%	3.50%	0.00%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	1.60%	0.00%	0.00%	0.00%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	3	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	3	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	0.00%	1.80%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.70%	1.60%	3.20%	1.80%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	3	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	0.00%	0.00%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	1.60%	1.80%	0.00%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	3.70%	1.60%	1.60%	1.80%	0.00%	18.80%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	1.60%	3.20%	1.80%	2.60%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	5.60%	3.10%	0.00%	1.80%	2.60%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	1.80%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	10 to 14	100 to 299	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	7.40%	7.80%	8.10%	8.80%	5.30%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	4.80%	5.30%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	0.00%	0.00%	0.00%	0.00%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	1.60%	3.20%	1.80%	0.00%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	1.80%	5.30%	0.00%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	20+	100 to 299	100.00%	100.00%	100.00%	100.00%	4.20%	4.80%	3.70%	1.60%	1.60%	0.00%	0.00%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	3.10%	0.00%	1.80%	2.60%	6.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	86	Mass State Area 7 - LMA 1 (0 -3)	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	3.70%	3.10%	3.20%	5.30%	5.30%	6.30%
MA	86	Mass State Area 7 - LMA 1 (0 -3)	20+	800+	0.00%	0.00%	0.00%	0.00%	4.20%	7.10%	7.40%	9.40%	12.90%	12.30%	15.80%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	2	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	9.50%	14.80%	9.40%	9.70%	7.00%	7.90%	12.50%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	2	100 to 299	0.00%	0.00%	0.00%	0.00%	16.70%	14.30%	13.00%	18.80%	16.10%	17.50%	18.40%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	2	300 to 499	0.00%	0.00%	0.00%	0.00%	16.70%	9.50%	13.00%	9.40%	9.70%	8.80%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	2	500 to 799	0.00%	0.00%	0.00%	0.00%	12.50%	11.90%	5.60%	6.30%	4.80%	7.00%	7.90%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	2	800+	0.00%	0.00%	0.00%	0.00%	4.20%	7.10%	5.60%	4.70%	4.80%	3.50%	0.00%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	3	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	1.60%	0.00%	0.00%	0.00%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	3	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	3	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	0.00%	1.80%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	3	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	3.70%	1.60%	3.20%	1.80%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	3	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	0.00%	0.00%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	1.60%	1.60%	1.80%	0.00%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.80%	3.70%	1.60%	1.60%	1.80%	0.00%	18.80%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	1.60%	3.20%	1.80%	2.60%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	5.60%	3.10%	0.00%	1.80%	2.60%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	6 to 9	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.60%	1.60%	1.80%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.90%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	10 to 14	100 to 299	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	0.00%	3.10%	3.20%	3.50%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	7.40%	7.80%	8.10%	8.80%	5.30%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	4.80%	5.30%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	0.00%	0.00%	2.60%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	0.00%	0.00%	0.00%	0.00%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	1.60%	3.20%	1.80%	0.00%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	1.90%	1.60%	1.60%	1.80%	5.30%	0.00%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	20+	100 to 299	100.00%	100.00%	100.00%	100.00%	4.20%	4.80%	3.70%	1.60%	1.60%	0.00%	0.00%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	4.20%	0.00%	1.90%	3.10%	0.00%	1.80%	2.60%	6.30%
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	7.10%	3.70%	3.10%	3.20%	5.30%	5.30%	6.30%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	87	Mass State Area 7 - LMA 1/OC (0-3)	20+	800+	0.00%	0.00%	0.00%	0.00%	4.20%	7.10%	7.40%	9.40%	12.90%	12.30%	15.80%	6.30%
MA	88	Mass State Area 8 - LMA 1 (0-3)	2	0 to 99	0.00%	0.00%	0.00%	0.00%	16.70%	16.00%	21.20%	16.70%	14.60%	5.40%	9.10%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	2	100 to 299	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	9.10%	7.10%	4.90%	5.40%	9.10%	4.50%
MA	88	Mass State Area 8 - LMA 1 (0-3)	2	300 to 499	0.00%	0.00%	0.00%	0.00%	8.30%	12.00%	6.10%	7.10%	4.90%	8.10%	0.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	2	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	12.00%	12.10%	7.10%	7.30%	2.70%	0.00%	4.50%
MA	88	Mass State Area 8 - LMA 1 (0-3)	3	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	2.40%	2.40%	2.70%	0.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	6 to 9	0 to 99	0.00%	0.00%	0.00%	0.00%	8.30%	0.00%	0.00%	0.00%	2.40%	5.40%	0.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	6 to 9	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	3.00%	2.40%	7.30%	5.40%	0.00%	4.50%
MA	88	Mass State Area 8 - LMA 1 (0-3)	6 to 9	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.50%
MA	88	Mass State Area 8 - LMA 1 (0-3)	6 to 9	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.70%	0.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	2.40%	0.00%	0.00%	3.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	10 to 14	100 to 299	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	10 to 14	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	0.00%	0.00%	2.40%	0.00%	6.10%	4.50%
MA	88	Mass State Area 8 - LMA 1 (0-3)	10 to 14	800+	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	7.10%	4.90%	5.40%	3.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	4.00%	6.10%	4.80%	2.40%	2.70%	3.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	15 to 19	300 to 499	12.50%	12.50%	12.50%	12.50%	0.00%	4.00%	3.00%	2.40%	7.30%	8.10%	6.10%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%	0.00%	0.00%	6.10%	9.10%
MA	88	Mass State Area 8 - LMA 1 (0-3)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	20+	0 to 99	12.50%	12.50%	12.50%	12.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	88	Mass State Area 8 - LMA 1 (0-3)	20+	100 to 299	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	9.10%	2.40%	2.40%	0.00%	0.00%	4.50%
MA	88	Mass State Area 8 - LMA 1 (0-3)	20+	300 to 499	12.50%	12.50%	12.50%	12.50%	8.30%	8.00%	3.00%	7.10%	2.40%	5.40%	9.10%	13.60%
MA	88	Mass State Area 8 - LMA 1 (0-3)	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	8.30%	4.00%	3.00%	4.80%	4.90%	5.40%	6.10%	18.20%
MA	88	Mass State Area 8 - LMA 1 (0-3)	20+	800+	12.50%	12.50%	12.50%	12.50%	16.70%	16.00%	18.20%	26.20%	29.30%	35.10%	36.40%	31.80%
MA	89	Mass Nearshore Area 17 - LMA 2 (3-12)	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	50.00%	33.30%	33.30%	33.30%	33.30%	25.00%	33.30%	0.00%
MA	89	Mass Nearshore Area 17 - LMA 2 (3-12)	20+	800+	100.00%	100.00%	100.00%	100.00%	50.00%	66.70%	66.70%	66.70%	66.70%	75.00%	66.70%	100.00%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	10 to 14	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	6.90%	12.50%	5.00%	0.00%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	10 to 14	100 to 299	0.00%	0.00%	0.00%	16.70%	21.40%	4.30%	7.40%	9.70%	10.30%	4.20%	0.00%	5.90%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	8.70%	7.40%	6.50%	3.40%	4.20%	0.00%	0.00%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	4.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	7.10%	8.70%	3.70%	6.50%	6.90%	4.20%	10.00%	0.00%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	4.30%	7.40%	6.50%	3.40%	8.30%	10.00%	11.80%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	15 to 19	500 to 799	9.10%	11.10%	10.00%	8.30%	7.10%	4.30%	7.40%	9.70%	13.80%	4.20%	5.00%	5.90%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	20+	0 to 99	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	20+	100 to 299	0.00%	0.00%	0.00%	8.30%	0.00%	4.30%	11.10%	3.20%	6.90%	4.20%	5.00%	17.60%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	20+	300 to 499	9.10%	11.10%	10.00%	0.00%	14.30%	13.00%	7.40%	12.90%	10.30%	4.20%	0.00%	0.00%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	20+	500 to 799	27.30%	33.30%	20.00%	33.30%	28.60%	13.00%	22.20%	16.10%	17.20%	29.20%	30.00%	17.60%
MA	90	Mass Nearshore Area 16 - LMA 2 (3-12)	20+	800+	54.50%	44.40%	50.00%	33.30%	21.40%	34.80%	25.90%	25.80%	20.70%	25.00%	35.00%	41.20%
MA	91	Mass Nearshore Area 17 - LMA OC (3-12)	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	50.00%	33.30%	33.30%	33.30%	33.30%	25.00%	33.30%	0.00%
MA	91	Mass Nearshore Area 17 - LMA OC (3-12)	20+	800+	100.00%	100.00%	100.00%	100.00%	50.00%	66.70%	66.70%	66.70%	66.70%	75.00%	66.70%	100.00%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	10 to 14	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	5.90%	0.00%	9.10%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	10 to 14	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	5.90%	0.00%	9.10%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	9.10%	7.10%	7.70%	0.00%	0.00%	0.00%	9.10%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	9.10%	7.10%	7.70%	0.00%	0.00%	0.00%	9.10%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	7.10%	5.90%	7.70%	0.00%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	7.10%	5.90%	7.70%	0.00%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	7.70%	7.10%	5.90%	0.00%	0.00%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	7.70%	7.10%	5.90%	0.00%	0.00%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	7.70%	14.30%	11.80%	15.40%	18.20%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	7.70%	14.30%	11.80%	15.40%	18.20%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	18.20%	14.30%	15.40%	14.30%	5.90%	7.70%	0.00%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	18.20%	14.30%	15.40%	14.30%	5.90%	7.70%	0.00%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	0.00%	0.00%	7.70%	0.00%	5.90%	0.00%	18.20%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	0.00%	0.00%	7.70%	0.00%	5.90%	0.00%	18.20%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	45.50%	35.70%	30.80%	28.60%	29.40%	38.50%	18.20%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	45.50%	35.70%	30.80%	28.60%	29.40%	38.50%	18.20%
MA	920	Mass Nearshore Area 18 - LMA 1 (3-6)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	18.20%	21.40%	23.10%	28.60%	29.40%	23.10%	18.20%
MA	921	Mass Nearshore Area 18 - LMA 1 (6-12)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	18.20%	21.40%	23.10%	28.60%	29.40%	23.10%	18.20%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	10 to 14	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	5.90%	0.00%	9.10%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	9.10%	7.10%	7.70%	0.00%	0.00%	0.00%	9.10%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	7.10%	5.90%	7.70%	0.00%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	7.70%	7.10%	5.90%	0.00%	0.00%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	7.70%	14.30%	11.80%	15.40%	18.20%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	18.20%	14.30%	15.40%	14.30%	5.90%	7.70%	0.00%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	0.00%	0.00%	7.70%	0.00%	5.90%	0.00%	18.20%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	45.50%	35.70%	30.80%	28.60%	29.40%	38.50%	18.20%
MA	93	Mass Nearshore Area 18 - LMA 2 (3-12)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	18.20%	21.40%	23.10%	28.60%	29.40%	23.10%	18.20%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	10 to 14	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	5.90%	0.00%	9.10%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	9.10%	7.10%	7.70%	0.00%	0.00%	0.00%	9.10%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	7.10%	5.90%	7.70%	0.00%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	7.70%	7.10%	5.90%	0.00%	0.00%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	7.70%	14.30%	11.80%	15.40%	18.20%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	18.20%	14.30%	15.40%	14.30%	5.90%	7.70%	0.00%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	0.00%	0.00%	7.70%	0.00%	5.90%	0.00%	18.20%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	45.50%	35.70%	30.80%	28.60%	29.40%	38.50%	18.20%
MA	94	Mass Nearshore Area 18 - LMA 3 (3-12)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	18.20%	21.40%	23.10%	28.60%	29.40%	23.10%	18.20%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	10 to 14	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	5.90%	0.00%	9.10%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	9.10%	7.10%	7.70%	0.00%	0.00%	0.00%	9.10%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.10%	0.00%	7.10%	5.90%	7.70%	0.00%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	15 to 19	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.30%	7.70%	7.10%	5.90%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%	0.00%	7.70%	14.30%	11.80%	15.40%	18.20%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	18.20%	14.30%	15.40%	14.30%	5.90%	7.70%	0.00%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	0.00%	0.00%	7.70%	0.00%	5.90%	0.00%	18.20%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	45.50%	35.70%	30.80%	28.60%	29.40%	38.50%	18.20%
MA	95	Mass Nearshore Area 18 - LMA OC (3-12)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	18.20%	21.40%	23.10%	28.60%	29.40%	23.10%	18.20%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	10 to 14	0 to 99	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	2.50%	2.10%	1.00%	1.90%	1.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	10 to 14	0 to 99	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	2.50%	2.10%	1.00%	1.90%	1.00%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	10 to 14	100 to 299	2.90%	7.70%	5.90%	4.50%	7.10%	4.70%	4.80%	3.80%	3.10%	5.90%	4.70%	2.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	10 to 14	100 to 299	2.90%	7.70%	5.90%	4.50%	7.10%	4.70%	4.80%	3.80%	3.10%	5.90%	4.70%	2.00%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	10 to 14	300 to 499	5.90%	0.00%	0.00%	0.00%	5.70%	7.80%	11.30%	8.80%	10.30%	6.90%	5.70%	5.10%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	10 to 14	300 to 499	5.90%	0.00%	0.00%	0.00%	5.70%	7.80%	11.30%	8.80%	10.30%	6.90%	5.70%	5.10%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	10 to 14	500 to 799	0.00%	0.00%	0.00%	2.30%	0.00%	0.00%	1.60%	1.30%	0.00%	0.00%	0.90%	0.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	2.30%	0.00%	0.00%	1.60%	1.30%	0.00%	0.00%	0.90%	0.00%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	10 to 14	800+	1.50%	5.10%	5.90%	2.30%	1.40%	0.00%	1.60%	0.00%	1.00%	1.00%	0.90%	1.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	10 to 14	800+	1.50%	5.10%	5.90%	2.30%	1.40%	0.00%	1.60%	0.00%	1.00%	1.00%	0.90%	1.00%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	15 to 19	100 to 299	1.50%	2.60%	2.90%	2.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	15 to 19	100 to 299	1.50%	2.60%	2.90%	2.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	15 to 19	300 to 499	2.90%	7.70%	8.80%	6.80%	0.00%	4.70%	4.80%	2.50%	4.10%	4.00%	2.80%	2.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	15 to 19	300 to 499	2.90%	7.70%	8.80%	6.80%	0.00%	4.70%	4.80%	2.50%	4.10%	4.00%	2.80%	2.00%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	15 to 19	500 to 799	2.90%	5.10%	2.90%	2.30%	2.90%	1.60%	0.00%	1.30%	1.00%	1.00%	1.90%	3.10%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	15 to 19	500 to 799	2.90%	5.10%	2.90%	2.30%	2.90%	1.60%	0.00%	1.30%	1.00%	1.00%	1.90%	3.10%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	15 to 19	800+	5.90%	0.00%	2.90%	4.50%	1.40%	0.00%	0.00%	2.50%	1.00%	3.00%	3.80%	4.10%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	15 to 19	800+	5.90%	0.00%	2.90%	4.50%	1.40%	0.00%	0.00%	2.50%	1.00%	3.00%	3.80%	4.10%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	20+	0 to 99	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	20+	0 to 99	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	20+	100 to 299	5.90%	5.10%	2.90%	4.50%	8.60%	4.70%	3.20%	3.80%	1.00%	3.00%	1.90%	2.00%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	20+	100 to 299	5.90%	5.10%	2.90%	4.50%	8.60%	4.70%	3.20%	3.80%	1.00%	3.00%	1.90%	2.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	20+	300 to 499	8.80%	5.10%	5.90%	11.40%	8.60%	10.90%	3.20%	7.50%	6.20%	6.90%	5.70%	9.20%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	20+	300 to 499	8.80%	5.10%	5.90%	11.40%	8.60%	10.90%	3.20%	7.50%	6.20%	6.90%	5.70%	9.20%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	20+	500 to 799	7.40%	10.30%	14.70%	9.10%	14.30%	7.80%	11.30%	3.80%	8.20%	7.90%	6.60%	9.20%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	20+	500 to 799	7.40%	10.30%	14.70%	9.10%	14.30%	7.80%	11.30%	3.80%	8.20%	7.90%	6.60%	9.20%
MA	960	Mass Nearshore Area 19 - LMA 1 (3-6)	20+	800+	51.50%	51.30%	47.10%	50.00%	50.00%	57.80%	54.80%	62.50%	61.90%	59.40%	62.30%	60.20%
MA	961	Mass Nearshore Area 19 - LMA 1 (6-12)	20+	800+	51.50%	51.30%	47.10%	50.00%	50.00%	57.80%	54.80%	62.50%	61.90%	59.40%	62.30%	60.20%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	10 to 14	0 to 99	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	2.50%	2.10%	1.00%	1.90%	1.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	10 to 14	100 to 299	2.90%	7.70%	5.90%	4.50%	7.10%	4.70%	4.80%	3.80%	3.10%	5.90%	4.70%	2.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	10 to 14	300 to 499	5.90%	0.00%	0.00%	0.00%	5.70%	7.80%	11.30%	8.80%	10.30%	6.90%	5.70%	5.10%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	2.30%	0.00%	0.00%	1.60%	1.30%	0.00%	0.00%	0.90%	0.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	10 to 14	800+	1.50%	5.10%	5.90%	2.30%	1.40%	0.00%	1.60%	0.00%	1.00%	1.00%	0.90%	1.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	15 to 19	100 to 299	1.50%	2.60%	2.90%	2.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.90%	1.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	15 to 19	300 to 499	2.90%	7.70%	8.80%	6.80%	0.00%	4.70%	4.80%	2.50%	4.10%	4.00%	2.80%	2.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	15 to 19	500 to 799	2.90%	5.10%	2.90%	2.30%	2.90%	1.60%	0.00%	1.30%	1.00%	1.00%	1.90%	3.10%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	15 to 19	800+	5.90%	0.00%	2.90%	4.50%	1.40%	0.00%	0.00%	2.50%	1.00%	3.00%	3.80%	4.10%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	20+	0 to 99	1.50%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	20+	100 to 299	5.90%	5.10%	2.90%	4.50%	8.60%	4.70%	3.20%	3.80%	1.00%	3.00%	1.90%	2.00%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	20+	300 to 499	8.80%	5.10%	5.90%	11.40%	8.60%	10.90%	3.20%	7.50%	6.20%	6.90%	5.70%	9.20%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	20+	500 to 799	7.40%	10.30%	14.70%	9.10%	14.30%	7.80%	11.30%	3.80%	8.20%	7.90%	6.60%	9.20%
MA	97	Mass Nearshore Area 19 - LMA OC (3-12)	20+	800+	51.50%	51.30%	47.10%	50.00%	50.00%	57.80%	54.80%	62.50%	61.90%	59.40%	62.30%	60.20%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	10 to 14	100 to 299	8.30%	10.00%	0.00%	11.10%	14.30%	10.00%	0.00%	0.00%	0.00%	0.00%	11.10%	14.30%
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	10 to 14	100 to 299	8.30%	10.00%	0.00%	11.10%	14.30%	10.00%	0.00%	0.00%	0.00%	0.00%	11.10%	14.30%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	16.70%	20.00%	12.50%	0.00%	0.00%
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	10 to 14	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	16.70%	20.00%	12.50%	0.00%	0.00%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	10 to 14	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	10 to 14	800+	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	10 to 14	800+	0.00%	0.00%	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	20+	100 to 299	8.30%	10.00%	14.30%	11.10%	14.30%	10.00%	25.00%	16.70%	0.00%	0.00%	0.00%	0.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	20+	100 to 299	8.30%	10.00%	14.30%	11.10%	14.30%	10.00%	25.00%	16.70%	0.00%	0.00%	0.00%	0.00%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.70%	20.00%	25.00%	0.00%	0.00%
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.70%	20.00%	25.00%	0.00%	0.00%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	20+	500 to 799	16.70%	10.00%	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	22.20%	0.00%
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	20+	500 to 799	16.70%	10.00%	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	22.20%	0.00%
MA	980	Mass Nearshore Area 20 LMA 1 (3-6)	20+	800+	66.70%	70.00%	57.10%	77.80%	71.40%	60.00%	50.00%	50.00%	60.00%	62.50%	66.70%	85.70%
MA	981	Mass Nearshore Area 20 LMA 1 (6-12)	20+	800+	66.70%	70.00%	57.10%	77.80%	71.40%	60.00%	50.00%	50.00%	60.00%	62.50%	66.70%	85.70%
MA	99	Mass Nearshore Area 17 - LMA 2 (12+)	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	50.00%	33.30%	33.30%	33.30%	33.30%	25.00%	33.30%	0.00%
MA	99	Mass Nearshore Area 17 - LMA 2 (12+)	20+	800+	100.00%	100.00%	100.00%	100.00%	50.00%	66.70%	66.70%	66.70%	66.70%	75.00%	66.70%	100.00%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	15 to 19	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	6.90%	12.50%	5.00%	0.00%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	15 to 19	100 to 299	0.00%	0.00%	0.00%	16.70%	28.60%	13.00%	11.10%	16.10%	17.20%	8.30%	10.00%	5.90%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	13.00%	14.80%	12.90%	6.90%	12.50%	10.00%	11.80%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	15 to 19	500 to 799	9.10%	11.10%	10.00%	8.30%	7.10%	8.70%	7.40%	9.70%	13.80%	4.20%	5.00%	5.90%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	20+	0 to 99	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	20+	100 to 299	0.00%	0.00%	0.00%	8.30%	0.00%	4.30%	11.10%	3.20%	6.90%	4.20%	5.00%	17.60%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	20+	300 to 499	9.10%	11.10%	10.00%	0.00%	14.30%	13.00%	7.40%	12.90%	10.30%	4.20%	0.00%	0.00%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	20+	500 to 799	27.30%	33.30%	20.00%	33.30%	28.60%	13.00%	22.20%	16.10%	17.20%	29.20%	30.00%	17.60%
MA	100	Mass Nearshore Area 16 - LMA 2 (12+)	20+	800+	54.50%	44.40%	50.00%	33.30%	21.40%	34.80%	25.90%	25.80%	20.70%	25.00%	35.00%	41.20%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	15 to 19	0 to 99	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	6.90%	12.50%	5.00%	0.00%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	15 to 19	100 to 299	0.00%	0.00%	0.00%	16.70%	28.60%	13.00%	11.10%	16.10%	17.20%	8.30%	10.00%	5.90%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	13.00%	14.80%	12.90%	6.90%	12.50%	10.00%	11.80%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	15 to 19	500 to 799	9.10%	11.10%	10.00%	8.30%	7.10%	8.70%	7.40%	9.70%	13.80%	4.20%	5.00%	5.90%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	20+	0 to 99	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	20+	100 to 299	0.00%	0.00%	0.00%	8.30%	0.00%	4.30%	11.10%	3.20%	6.90%	4.20%	5.00%	17.60%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	20+	300 to 499	9.10%	11.10%	10.00%	0.00%	14.30%	13.00%	7.40%	12.90%	10.30%	4.20%	0.00%	0.00%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	20+	500 to 799	27.30%	33.30%	20.00%	33.30%	28.60%	13.00%	22.20%	16.10%	17.20%	29.20%	30.00%	17.60%
MA	101	Mass Nearshore Area 16 - LMA 2/3 (12+)	20+	800+	54.50%	44.40%	50.00%	33.30%	21.40%	34.80%	25.90%	25.80%	20.70%	25.00%	35.00%	41.20%
MA	102	Mass Nearshore Area 17 - LMA 2/3 Overlap (12+)	20+	500 to 799	0.00%	0.00%	0.00%	0.00%	50.00%	33.30%	33.30%	33.30%	33.30%	25.00%	33.30%	0.00%
MA	102	Mass Nearshore Area 17 - LMA 2/3 Overlap (12+)	20+	800+	100.00%	100.00%	100.00%	100.00%	50.00%	66.70%	66.70%	66.70%	66.70%	75.00%	66.70%	100.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MA	103	Mass Nearshore Area 18 - LMA 1 (12+)	20+	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	14.30%	7.70%	7.10%	11.80%	7.70%	9.10%
MA	103	Mass Nearshore Area 18 - LMA 1 (12+)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	57.10%	9.10%	7.10%	15.40%	0.00%	5.90%	0.00%	36.40%
MA	103	Mass Nearshore Area 18 - LMA 1 (12+)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	54.50%	42.90%	38.50%	50.00%	47.10%	61.50%	36.40%
MA	103	Mass Nearshore Area 18 - LMA 1 (12+)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	36.40%	35.70%	38.50%	42.90%	35.30%	30.80%	18.20%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	15 to 19	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	14.30%	7.70%	7.10%	11.80%	0.00%	9.10%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	15 to 19	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	9.10%	7.10%	7.70%	0.00%	0.00%	0.00%	18.20%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	15 to 19	500 to 799	0.00%	0.00%	0.00%	0.00%	0.00%	9.10%	7.10%	7.70%	21.40%	17.60%	23.10%	18.20%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	15 to 19	800+	0.00%	0.00%	0.00%	0.00%	0.00%	18.20%	14.30%	15.40%	14.30%	5.90%	7.70%	0.00%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	20+	100 to 299	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	7.70%	0.00%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	28.60%	0.00%	0.00%	7.70%	0.00%	5.90%	0.00%	18.20%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	45.50%	35.70%	30.80%	28.60%	29.40%	38.50%	18.20%
MA	104	Mass Nearshore Area 18 - LMA 2 (12+)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	18.20%	21.40%	23.10%	28.60%	29.40%	23.10%	18.20%
MA	105	Mass Nearshore Area 18 - LMA 2/3 (12+)	20+	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	14.30%	7.70%	7.10%	11.80%	7.70%	9.10%
MA	105	Mass Nearshore Area 18 - LMA 2/3 (12+)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	57.10%	9.10%	7.10%	15.40%	0.00%	5.90%	0.00%	36.40%
MA	105	Mass Nearshore Area 18 - LMA 2/3 (12+)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	54.50%	42.90%	38.50%	50.00%	47.10%	61.50%	36.40%
MA	105	Mass Nearshore Area 18 - LMA 2/3 (12+)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	36.40%	35.70%	38.50%	42.90%	35.30%	30.80%	18.20%
MA	106	Mass Nearshore Area 18 - LMA OC (12+)	20+	100 to 299	50.00%	0.00%	0.00%	0.00%	14.30%	0.00%	14.30%	7.70%	7.10%	11.80%	7.70%	9.10%
MA	106	Mass Nearshore Area 18 - LMA OC (12+)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	57.10%	9.10%	7.10%	15.40%	0.00%	5.90%	0.00%	36.40%
MA	106	Mass Nearshore Area 18 - LMA OC (12+)	20+	500 to 799	25.00%	0.00%	0.00%	0.00%	28.60%	54.50%	42.90%	38.50%	50.00%	47.10%	61.50%	36.40%
MA	106	Mass Nearshore Area 18 - LMA OC (12+)	20+	800+	25.00%	100.00%	100.00%	100.00%	0.00%	36.40%	35.70%	38.50%	42.90%	35.30%	30.80%	18.20%
MA	107	Mass Nearshore Area 19 - LMA 1 (12+)	20+	0 to 99	2.90%	0.00%	0.00%	0.00%	0.00%	0.00%	3.20%	2.50%	2.10%	1.00%	1.90%	1.00%
MA	107	Mass Nearshore Area 19 - LMA 1 (12+)	20+	100 to 299	10.30%	15.40%	11.80%	11.40%	15.70%	9.40%	8.10%	7.50%	4.10%	8.90%	7.50%	5.10%
MA	107	Mass Nearshore Area 19 - LMA 1 (12+)	20+	300 to 499	17.60%	12.80%	14.70%	18.20%	14.30%	23.40%	19.40%	18.80%	20.60%	17.80%	14.20%	16.30%
MA	107	Mass Nearshore Area 19 - LMA 1 (12+)	20+	500 to 799	10.30%	15.40%	17.60%	13.60%	17.10%	9.40%	12.90%	6.30%	9.30%	8.90%	9.40%	12.20%
MA	107	Mass Nearshore Area 19 - LMA 1 (12+)	20+	800+	58.80%	56.40%	55.90%	56.80%	52.90%	57.80%	56.50%	65.00%	63.90%	63.40%	67.00%	65.30%
MA	108	Mass Nearshore Area 20 LMA 1 (12+)	20+	100 to 299	16.70%	20.00%	14.30%	22.20%	28.60%	20.00%	25.00%	16.70%	0.00%	0.00%	11.10%	14.30%
MA	108	Mass Nearshore Area 20 LMA 1 (12+)	20+	300 to 499	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	25.00%	33.30%	40.00%	37.50%	0.00%	0.00%
MA	108	Mass Nearshore Area 20 LMA 1 (12+)	20+	500 to 799	16.70%	10.00%	14.30%	0.00%	0.00%	10.00%	0.00%	0.00%	0.00%	0.00%	22.20%	0.00%
MA	108	Mass Nearshore Area 20 LMA 1 (12+)	20+	800+	66.70%	70.00%	71.40%	77.80%	71.40%	60.00%	50.00%	50.00%	60.00%	62.50%	66.70%	85.70%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RI	109	RI 538 / 539 Bays Exempt	1	1 to 100	5.60%	9.10%	6.70%	7.10%	11.80%	23.00%	28.10%	25.70%	12.00%	5.40%	6.30%	3.60%
RI	109	RI 538 / 539 Bays Exempt	5	1 to 100	0.00%	0.00%	6.70%	3.60%	7.80%	12.20%	10.10%	8.10%	10.00%	5.40%	3.10%	3.60%
RI	109	RI 538 / 539 Bays Exempt	5	101 to 500	0.00%	0.00%	0.00%	0.00%	2.00%	1.40%	1.10%	1.40%	2.00%	0.00%	0.00%	0.00%
RI	109	RI 538 / 539 Bays Exempt	10	1 to 100	0.00%	0.00%	0.00%	3.60%	5.90%	6.80%	6.70%	6.80%	4.00%	0.00%	3.10%	0.00%
RI	109	RI 538 / 539 Bays Exempt	10	101 to 500	5.60%	9.10%	13.30%	7.10%	3.90%	4.10%	5.60%	4.10%	4.00%	5.40%	3.10%	3.60%
RI	109	RI 538 / 539 Bays Exempt	15	1 to 100	16.70%	9.10%	6.70%	10.70%	3.90%	2.70%	5.60%	5.40%	6.00%	10.80%	15.60%	17.90%
RI	109	RI 538 / 539 Bays Exempt	15	101 to 500	27.80%	9.10%	40.00%	28.60%	31.40%	21.60%	18.00%	18.90%	22.00%	24.30%	28.10%	35.70%
RI	109	RI 538 / 539 Bays Exempt	15	501 to 800	44.40%	63.60%	26.70%	35.70%	31.40%	28.40%	24.70%	29.70%	40.00%	48.60%	40.60%	35.70%
RI	109	RI 538 / 539 Bays Exempt	15	801+	0.00%	0.00%	0.00%	3.60%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	110	RI 538 / 539 Atlantic Exempt	1	1 to 100	5.60%	9.10%	6.70%	7.10%	11.80%	23.00%	28.10%	25.70%	12.00%	5.40%	6.30%	3.60%
RI	110	RI 538 / 539 Atlantic Exempt	5	1 to 100	0.00%	0.00%	6.70%	3.60%	7.80%	12.20%	10.10%	8.10%	10.00%	5.40%	3.10%	3.60%
RI	110	RI 538 / 539 Atlantic Exempt	5	101 to 500	0.00%	0.00%	0.00%	0.00%	2.00%	1.40%	1.10%	1.40%	2.00%	0.00%	0.00%	0.00%
RI	110	RI 538 / 539 Atlantic Exempt	10	1 to 100	0.00%	0.00%	0.00%	3.60%	5.90%	6.80%	6.70%	6.80%	4.00%	0.00%	3.10%	0.00%
RI	110	RI 538 / 539 Atlantic Exempt	10	101 to 500	5.60%	9.10%	13.30%	7.10%	3.90%	4.10%	5.60%	4.10%	4.00%	5.40%	3.10%	3.60%
RI	110	RI 538 / 539 Atlantic Exempt	15	1 to 100	16.70%	9.10%	6.70%	10.70%	3.90%	2.70%	5.60%	5.40%	6.00%	10.80%	15.60%	17.90%
RI	110	RI 538 / 539 Atlantic Exempt	15	101 to 500	27.80%	9.10%	40.00%	28.60%	31.40%	21.60%	18.00%	18.90%	22.00%	24.30%	28.10%	35.70%
RI	110	RI 538 / 539 Atlantic Exempt	15	501 to 800	44.40%	63.60%	26.70%	35.70%	31.40%	28.40%	24.70%	29.70%	40.00%	48.60%	40.60%	35.70%
RI	110	RI 538 / 539 Atlantic Exempt	15	801+	0.00%	0.00%	0.00%	3.60%	2.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	111	RI 611 Exempt (Northeast)	1	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	42.90%	33.30%	20.00%	20.00%	20.00%	20.00%
RI	111	RI 611 Exempt (Northeast)	5	1 to 100	100.00%	100.00%	100.00%	100.00%	50.00%	20.00%	14.30%	16.70%	20.00%	20.00%	20.00%	20.00%
RI	111	RI 611 Exempt (Northeast)	10	1 to 100	0.00%	0.00%	0.00%	0.00%	50.00%	20.00%	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	111	RI 611 Exempt (Northeast)	10	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.70%	20.00%	20.00%	20.00%	20.00%
RI	111	RI 611 Exempt (Northeast)	15	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	20.00%	20.00%	20.00%
RI	111	RI 611 Exempt (Northeast)	15	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	28.60%	33.30%	20.00%	20.00%	20.00%	20.00%
RI	112	RI 611 Exempt (Mid-Atlantic)	1	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	40.00%	42.90%	33.30%	20.00%	20.00%	20.00%	20.00%
RI	112	RI 611 Exempt (Mid-Atlantic)	5	1 to 100	100.00%	100.00%	100.00%	100.00%	50.00%	20.00%	14.30%	16.70%	20.00%	20.00%	20.00%	20.00%
RI	112	RI 611 Exempt (Mid-Atlantic)	10	1 to 100	0.00%	0.00%	0.00%	0.00%	50.00%	20.00%	14.30%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	112	RI 611 Exempt (Mid-Atlantic)	10	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	16.70%	20.00%	20.00%	20.00%	20.00%
RI	112	RI 611 Exempt (Mid-Atlantic)	15	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	20.00%	20.00%	20.00%

State	Region ID	Region_Name	Traps per Trawl	Traps Group	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RI	112	RI 611 Exempt (Mid-Atlantic)	15	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	20.00%	28.60%	33.30%	20.00%	20.00%	20.00%	20.00%
RI	113	RI 539 Nearshore - LMA 2 (3-12)	10	1 to 100	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.20%	4.50%	5.00%	0.00%	7.10%	0.00%
RI	113	RI 539 Nearshore - LMA 2 (3-12)	15	1 to 100	0.00%	0.00%	0.00%	8.30%	0.00%	0.00%	4.20%	0.00%	0.00%	11.10%	14.30%	8.30%
RI	113	RI 539 Nearshore - LMA 2 (3-12)	10	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	4.20%	4.50%	5.00%	5.60%	0.00%	0.00%
RI	113	RI 539 Nearshore - LMA 2 (3-12)	15	101 to 500	50.00%	20.00%	83.30%	41.70%	44.40%	31.60%	29.20%	27.30%	30.00%	27.80%	28.60%	41.70%
RI	113	RI 539 Nearshore - LMA 2 (3-12)	15	501 to 800	50.00%	80.00%	16.70%	41.70%	50.00%	68.40%	58.30%	63.60%	60.00%	55.60%	50.00%	50.00%
RI	113	RI 539 Nearshore - LMA 2 (3-12)	15	801+	0.00%	0.00%	0.00%	8.30%	5.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	114	RI 539 Nearshore - LMA 2 (12+)	15	1 to 100	0.00%	0.00%	0.00%	8.30%	0.00%	0.00%	8.30%	4.50%	5.00%	11.10%	21.40%	8.30%
RI	114	RI 539 Nearshore - LMA 2 (12+)	15	101 to 500	50.00%	20.00%	83.30%	41.70%	44.40%	31.60%	33.30%	31.80%	35.00%	33.30%	28.60%	41.70%
RI	114	RI 539 Nearshore - LMA 2 (12+)	15	501 to 800	50.00%	80.00%	16.70%	41.70%	50.00%	68.40%	58.30%	63.60%	60.00%	55.60%	50.00%	50.00%
RI	114	RI 539 Nearshore - LMA 2 (12+)	15	801+	0.00%	0.00%	0.00%	8.30%	5.60%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
RI	115	RI 613 Nearshore LMA 2/3 (12+)	20	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	50.00%	0.00%
RI	115	RI 613 Nearshore LMA 2/3 (12+)	20	801+	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	50.00%	50.00%	100.00%
RI	116	RI 613 LMA 4 (12+)	15	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	50.00%	0.00%
RI	116	RI 613 LMA 4 (12+)	15	801+	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	50.00%	50.00%	100.00%
RI	117	RI Area 613 LMA 2/3 Overlap Mid-Atlantic	15	101 to 500	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	50.00%	0.00%
RI	117	RI Area 613 LMA 2/3 Overlap Mid-Atlantic	15	801+	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	50.00%	50.00%	100.00%

CHAPTER 6 APPENDICES
Appendix 6.1 Gear Conversion Cost Methodology

This appendix describes the methods used to estimate the equipment cost associated with configuring gear to comply with minimum trawl length proposals included under Regulatory Alternative 2 and Three. Figure 6.1.1 summarizes the procedure used to estimate the incremental costs associated with converting to longer trawls. For each set of vessels, the method uses unit cost information and useful life information to estimate the annual costs of employing the baseline configuration of gear and the new configuration. The difference between these two annual costs represents the incremental cost of complying with the trawling requirement under consideration. The calculation of annualized costs is based on a 7 percent annual discount rate, consistent with current guidance from the Office of Management and Budget.

The estimation of gear conversion costs requires information on certain gear characteristics that are not specified in the Vertical Line Model. Table 6.1.1 summarizes these parameters.[5] As shown, the typical configuration of gear employed in trap/pot fisheries varies by region; this variation affects the cost of complying with the proposed trawling requirements. For example, Maine Zone A is characterized by strong tidal currents; to counter the potential effect of these currents, lobster vessels fishing in the area frequently use weights or anchors to keep their gear in place. Similarly, vessels in state waters commonly fish at shallower depths than do vessels in federal waters, and therefore require less line to connect trawls to surface buoys. While highly generalized, the assumptions summarized in the exhibit allow a more detailed estimate of the potential change in annual gear costs associated with the trawling requirements.

Table 6.1.2 summarizes all the essential gear cost data collected from multiple gear manufacturers and equipment suppliers in New England Area using 2019 average price.

[5] Most of the information in this table is adapted from a recent study developed by the Maine Lobstermen's Association (McCarron and Tetreault, 2012); some supplementary information comes from other sources.

Figure 6.1.1: Methodology for Calculating Costs of Gear Reconfiguration

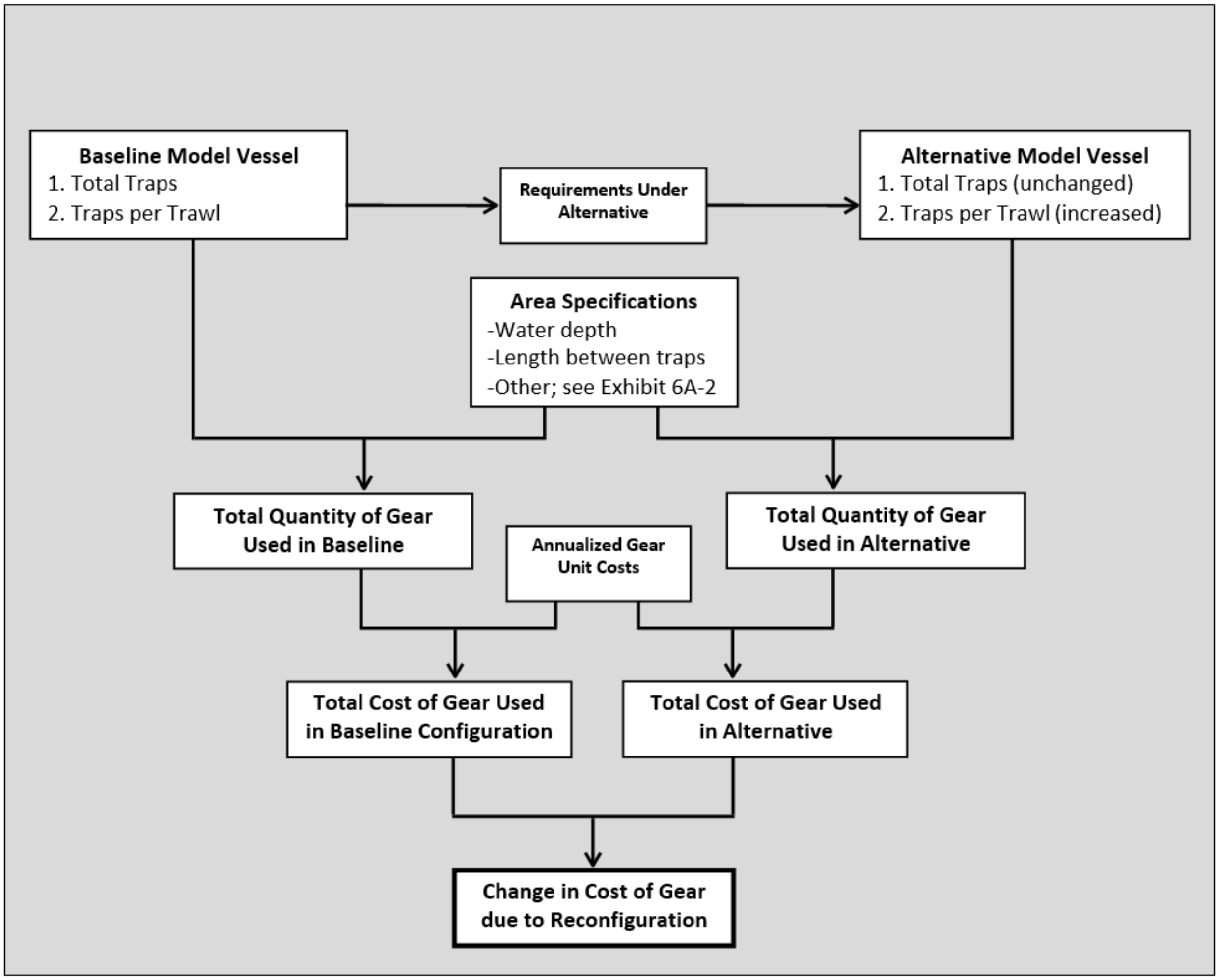

Table 6.1.1: Gear Specifications for Major Areas Affected by Trawling Proposals

State	Zone	Waters	Average Depth (m)	percent of VL that is Sink Line	VL Slack Factor[2]	VL Diam (cm)	Distance Between Traps (m)	Gangion Length (m)	Ground-line Diam. (cm)	First Buoy (cm x cm)	Second Buoy	Length of Line to 2nd Buoy (m)	Anchor (kg)	Length of Anchor Line (m)
ME	A	State	29.4	33%	1.5	1	18	1.8	1	13x28	13x28	18	18.	6
ME	A	Nearshore	135.6	25%	1.5	1	18	1.8	1	152 cm Polyball	13x28	18	18.	6
ME	B	State	34.2	33%	1.25	1	27	1.8	1	13x28	Toggle	18	N/A	N/A
ME	B	Nearshore	137.1	25%	1.25	1	27	1.8	1	16x36	13x28	18	N/A	N/A
ME	C	State	31.2	33%	1.3	1	14.4	1.8	1	13x28	N/A	N/A	N/A	N/A
ME	C	Nearshore	129.9	25%	2	1	27	1.8	1	18x36	13x28	18	N/A	N/A
ME	D	State	29.1	33%	1.2	1.1	13.5	1.8	1.1	13x28	N/A	N/A	N/A	N/A
ME	D	Nearshore	127.5	25%	1.25	1.1	22.5	1.8	1.1	23x41	13x28	18	N/A	N/A
ME	E	State	30.3	33%	1.15	1.1	13.5	1.8	1.1	13x28	N/A	N/A	N/A	N/A
ME	E	Nearshore	143.4	25%	1.15	1.1	27	1.8	1.1	23x41	N/A	N/A	N/A	N/A
ME	F	State	17.7	33%	1.15	1.1	18.9	1.8	1.1	13x28 (double)[3]	N/A	N/A	N/A	N/A
ME	F	Nearshore	154.5	25%	1.5	1.1	27	1.8	1.1	13x28	13x28	18	N/A	N/A
ME	G	State	28.8	33%	1.5	1	27	1.8	1	18x36	N/A	N/A	N/A	N/A
ME	G	Nearshore	124.8	25%	1.68	1	21.6	1.8	1	23x41	9x16	18	N/A	N/A
NH	N/A	State	21	33%	1.2	1	18	1.8	1	13x28	N/A	N/A	N/A	N/A
MA	N/A	State	17.7	33%	1.1	1	28.8	1.8	1	13x28 (double)	13x28	18	N/A	N/A
MA	N/A	Nearshore	62.7	25%	1.1	1	28.8	1.8	1	23x41	13x28	18	N/A	N/A
RI[4]	N/A	State	16.2	33%	1.1	1	30.9	1.8	1	13x28	N/A	N/A	N/A	N/A
RI	N/A	Nearshore	36	25%	1.1	1	30.9	1.8	1	23x41	13x28	18	N/A	N/A

Notes: 1. Average depth data were collected from the NOAA National Environmental Satellite, Data, and Information Service.
2. Slack factor represents the ratio of buoy line length to average water depth (e.g., 100 ft. depth * 1.5 slack factor = 150 ft. buoy line). Buoy line consists of a portion of sinking rope and a portion of floating rope.
3. A double 5x11 is two 5x11 buoys that are attached to the same stick. Correspondingly, the price is twice that of a single 5x11 buoy.
4. Data for Rhode Island vessels were not available. The figures applied are extrapolated from Massachusetts.
Sources: McCarron and Tetreault, 2012

Table 6.1.2: Gear Price Used in Estimation of Economic Impacts

Equipment Category	Description	2019 Average Price	Unit	Useful Life
Rope	3/8" (1 cm) sink rope, regular	$0.11	per foot (30 cm)	6
	3/8" (1 cm) sink rope, 1700 lb (771 kg)strength	$0.15	per foot (30 cm)	6
	3/4" (2 cm) sink rope, regular	$0.26	per foot (30 cm)	6
	3/4" (2cm) sink rope, 1700 lb (771 kg) strength	$0.34	per foot (30 cm)	6
Weak Links	600 lb (272 kg)light-weight plastic weak link	$1.77	per weak link	2.5
	600 lb (272 kg) plastic swivel weak link	$2.13	per weak link	2.5
	1,100 lb (499 kg) light-weight plastic weak link	$1.53	per weak link	5
	1,500 lb (680 kg) light-weight plastic weak link	$5.00	per weak link	5
Surface System Elements	Toggle	$2.25	per toggle	10
	Polyball 60" (152 cm)	$55.62	per buoy	10
	Bullet Buoy 5x11 (13x28 cm)	$4.77	per buoy	10
	Bullet Buoy 6x14 (16x36 cm)	$7.62	per buoy	10
	Bullet Buoy 7x14 (18x 36 cm)	$10.05	per buoy	10
	Bullet Buoy 9x16 (23x41 cm)	$19.55	per buoy	10
	Acorn Buoy 7x7(18x18 cm)	$4.65	per buoy	10
	High Flyer	$51.00	per flyer	10
Other	22 lb (10 KG)Danforth anchor	$98.54	per anchor	10
	40 lb (18 KG)Danforth anchor	$178.61	per anchor	10
	25 lb (11 KG)Danforth anchor	$119.54	per anchor	12
	43 lb (20 KG)Danforth anchor	$203.32	per anchor	12
	gear mark using duct tape	$0.04	per foot (30 cm)	5
	labor (in 2017 dollars)	$25.15	per hour	6
	gear marking with 1 min labor	$0.46	per foot (30 cm)	6
	South Shore sleeve	$2	per sleeve	6
	Sleeve with 5 min labor	$4.10	per sleeve	6

Appendix 6.2 Vessel Trip Report Data Processing Method

The VTR data used in calculating catching impacts were downloaded from NFMS NEFSC database and processed in following steps:

1. Keep records with gear code “PTL”, which is pot/trap lobster;
2. Remove records without “gear size” information. “Gear size” represents total number of traps in the water;
3. Remove records with larger “gear quantity” than “gear size”. “Gear quantity” represents trawl size;
4. Keep records only from Rhode Island, Massachusetts, New Hampshire and Maine vessels;
5. Assign Lobster Management Area (LMA) to each record according to the coordinates provided
6. Keep only records in LMA 1, LMA 2, OCC and LMA 3.
7. When there is no coordinates, we use “carea” to assign the LMA. “Carea” represent fishery statistical areas. We assign 511-514 to LMA1, 538 and 539 to LMA 2, 515 and 522 to LMA 3.
8. Calculate total traps fished in one trip by multiply “gear quantity” and “nhaul”. “Nhaul” represents the number of hauls in a trip;
9. Collapse data, sum the landing pounds, and average the trawl size by state, LMA, permit, and year. After collapsing, each record contains information of a permitted vessel’s yearly landing pounds and average fished traps per trip by state and LMA ;
10. Calculate the catch per trap data by dividing cumulative yearly catch by each trap fished;
11. Remove records with the first and last 1 percent catch per trap.
12. Summarize the catch per trap data by LMA.