Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: American Lobster Management Board

FROM: American Lobster Plan Development Team

DATE: April 11, 2016

SUBJECT: Potential Management Objectives for SNE Lobster Stock

The American Lobster Plan Development Team (PDT) met via conference call on March 23, 2016 to develop potential management objectives for the Southern New England (SNE) stock, a task assigned by the Lobster Board at the February meeting. The PDT discussed a spectrum of management objectives, ranging from increasing spawning stock biomass (SSB) through significant reductions in harvest to perpetuating the fishery at the expense of rebuilding the stock. Throughout the discussion, the PDT found the objectives of increasing the stock and preserving the fishery to be in conflict with one another. Moreover, the PDT felt increasing the stock size would not be possible if the goal was to maintain the current lobster industry.

This report is presented in two sections. The first section outlines the various management objectives developed by the PDT, as well as management tools which could be used to achieve these goals. The second section looks at the pros and cons of standardizing specific management measures in each Lobster Conservation Management Area (LCMA) within the SNE stock range.

PART 1: POTENTIAL MANAGEMENT OBJECTIVES

1. **Increase Spawning Stock Biomass**
   According to the projections presented by the Technical Committee (TC) at the February meeting, an 80-90% reduction in the current harvest rate would be needed to increase SSB under current levels of natural mortality. This could be achieved through a moratorium or the use of several management tools such as a quota, a narrow slot limit, or a long season closure. While these actions would likely lead to the loss of the SNE lobster industry, including the loss of fishing infrastructure and market space, increasing SSB through large reductions in harvest could lead to improved recruitment and higher stock abundance in the near future. Depending on the management tools chosen, some of the economic and infrastructure losses could be mitigated by the Jonah crab fishery if it is not constrained by trap reductions and/or closed areas.

2. **Stabilize Spawning Stock Biomass**
   The projections presented by the TC show a 75% reduction in the current harvest rate would be needed to stabilize SSB. Similar to the first objective, this large reduction in fishing mortality could be achieved using several management tools including a quota, changes to

the gauge size, targeted season closures, trip limits, or lower trap limits. Stabilizing SSB may help prevent further declines in abundance; however, it would negatively impact the fishery, with economic and infrastructure losses similar to those expected under the 80%-90% reduction in fishing mortality.

3. **50% Reduction in Fishing Mortality**
   In an effort to find an objective which balances biological benefits to the stock with mitigating hardship on the fishery, the PDT explored an objective which seeks a 50% reduction in fishing mortality. While a 50% reduction in harvest would primarily serve to slow the decline of the SNE stock, some biological benefits could be seen, such as a few years of improved adult survival and reproduction if environmental conditions are favorable. This objective would also allow a portion of the fishery and associated infrastructure to remain in place. Several management measures could be used to achieve a 50% reduction in fishing mortality including gauge size changes, season closures, area closures, quotas, or trap reductions.

4. **Optimize the Number of Eggs per Recruit**
   This objective seeks to take advantage of cool water temperatures and favorable climate conditions to produce several years of good recruitment. The PDT discussed that, while we cannot control many of the environmental factors which have contributed to the decline of the SNE stock, it is possible to implement management tools which optimizes the number of eggs in the water. If the Board were to choose this objective, the goal would be to maximize the probability of a successful recruitment event when there are favorable environmental conditions for settlement. Achieving this objective would require a decrease in the maximum gauge size and an increase in the minimum gauge size so as to leave as many spawners in the water as possible. The PDT warns against creating a male-only fishery as, given the low abundance of the stock, a decrease in the proportion of males may result in sperm limitations and eliminate the benefits of this species' social structure in maximizing successful reproduction.

5. **Perpetuate the Fishery**
   This socio-economic objective seeks to preserve and maintain a viable fishery in the short-run and does not address the need to increase or stabilize SSB. The PDT categorizes all measures which would reduce fishing mortality by 10-40% under this objective. Management tools which could be used to perpetuate the fishery include trap reductions, changes in the minimum or maximum gauge size, area closures, and season closures. While the biological benefits of this objective may be minimal and projections suggest the stock will continue to decline, this option would allow the SNE lobster fishery to continue until it is no longer economically viable.

6. **Improve Knowledge on Effectiveness of Management Measures**
   This objective seeks to learn about the success and/or failure of different management measures as they pertain to the improvement of various portions of the stock. The PDT highlights this objective can be combined with any percent reduction in fishing mortality. Implementing this objective would provide the opportunity to advance our knowledge on the

effectiveness of management tools so the lessons learned can be applied to other stocks as needed. This evaluation would be achieved through an iterative process in which areas (whether that be LCMAs, states, or smaller sub-regions) implement a percent reduction through different management tools such as a quota, closed season, or area closure. After implementing the selected management measures, analysis would be conducted to determine their impact on lobster abundance and stock health. For example, the effectiveness of an area closure could be analyzed by measuring the incidence of shell disease, the growth and size of lobsters, and spawning success within the closure and comparing this to areas outside of the closure. Several PDT members raised concerns regarding the feasibility of this objective, including the large budget associated with this project, the time needed to evaluate changes in stock condition, the high level of coordination and monitoring required, and the need for heavy industry cooperation; however, the PDT agreed that, if successful, the results would help inform future management of all American lobster stocks.

PART 2: PROS AND CONS OF STANDARDIZING MANAGEMENT MEASURES IN SNE

The following section looks at the cost and benefits of standardizing regulations in SNE. Overall, uniform regulations would likely improve enforcement and reduce uncertainty in the stock assessment. The PDT recommends many of the management tools outlined below be used in combination with one another to achieve desired reductions in the SNE lobster fishery. Furthermore, the PDT notes that standardizing management measures throughout SNE may require splitting LCMA 3 into two sections based on stock boundaries or by creating a SNE designation for Area 3 fishermen.

1. **Closed Seasons**

   There are currently three different closed seasons within the SNE stock: LCMA 4 is closed between April 30th and May 31st, LCMA 5 is closed between February 1st and March 31st, and LCMA 6 is closed between September 8th and November 28th. The PDT feels closed seasons are an effective tool to reduce harvest in the lobster fishery and a standardized closed season throughout SNE could be used to protect lobsters during vulnerable life stages. In SNE, a closed season would have the greatest conservation benefit if it occurred during the molt (June-July) and/or just prior to the time most females extrude eggs (July-August). Staggered closed seasons between the inshore LCMA's and Area 3 could also be implemented to protect lobsters as they migrate offshore in the winter and inshore in the spring and summer. While the PDT supports the use of closed seasons, they note the ability of fishermen to potentially recoup their landings by fishing more intensely during the open season.

2. **Trap Reductions**

   LCMA's 2 and 3 are currently undergoing a 50% and 25% reduction in traps, respectively. Analysis conducted by the Rhode Island Division of Fish and Wildlife suggests these reductions are expected to decrease fishing effort and could be a viable tool for other LCMAs. The PDT notes the effectiveness of trap reductions to decrease harvest is limited and delayed since the relationship between traps fished and landings is non-linear, causing latent effort to be removed first. As a result, the PDT recommends trap limits be used in combination with other

management tools to reduce exploitation. The PDT also highlights that, given lobster and Jonah crab are part of a mixed crustacean fishery, trap reductions in the lobster fishery could also impact the Jonah crab fishery.

3. **Minimum Gauge Size**
   LCMA's 2, 4, 5, and 6 currently have a minimum gauge size of $3\,3/8$" while LCMA 3 has a minimum gauge size of $3\,17/32$". Given the current status of the stock, standardizing the minimum gauge size would likely require an increase in the gauge size for LCMA's 2, 4, 5, and 6. This action would significantly impact the inshore fishery while having smaller effects on the offshore fishery. The primary benefits of increasing the minimum size are allowing lobsters to contribute to the stock's egg production before they are legally susceptible to harvest and reducing stock assessment uncertainty and enforcement challenges. The PDT does not recommend an increase in the minimum gauge size be the sole management tool used by the Board, as the fishery will continue to be largely dependent on newly-recruited lobsters. Should recruitment fluctuate, this dependence will result in an unstable fishery. Furthermore, an increase in the minimum size will result in increased discards, causing lobsters to encounter additional stress due to handling, temperature fluctuations, and exposure to predation.

4. **Maximum Gauge Size**
   LCMA 3 currently has a maximum gauge size of $6\,3/4$" while all other LCMAs in SNE have a maximum gauge size of $5\,1/4$". Efforts to standardize regulations and protect large spawners would likely result in a decrease in the maximum size in LCMA 3. This would have a negative impact on offshore fishermen where the lobsters tend to be larger. A benefit of a reduced maximum gauge size is the lobsters are protected in perpetuity and allowed to contribute to the spawning population. Furthermore, a uniform maximum gauge size would address concerns about diminished conservation value from non-uniform size limits as lobsters move between jurisdictions. A concern noted by the PDT is a decrease in the maximum gauge size will increase discards and, similar to an increase in the minimum gauge size, result in increased stress due to handling and temperature fluctuations. The PDT does not recommend a maximum gauge size decrease as the sole means to reduce exploitation in the SNE stock.

5. **V-Notch Requirement**
   Currently, LCMA 6 and state waters of LCMA 4 do not have a mandatory v-notch requirement. While a v-notch requirement would serve to protect known spawners, the PDT does not have any empirical evidence to show a mandatory v-notch program would significantly reduce exploitation of the SNE stock, especially given the precipitous decline in landings inshore. Other concerns include the fact that the effectiveness of v-notching is dependent on fishermen maintaining substantial harvest rates and high levels of compliance. Furthermore, the PDT cautions against a management approach which focuses solely on females as this could create a de facto male-only fishery and disrupt the reproductive dynamics of the SNE stock. The PDT notes a mandatory v-notch requirement would have to be combined with other management measures, in all SNE LCMAs, to achieve sizable reductions in harvest.