Research Priorities and Recommendations to Support Interjurisdictional Fisheries Management

JONAH CRAB

The Jonah Crab Technical Committee (TC) strongly encourages that any prospective researchers considering projects to address these recommendations reach out to the TC to ensure project results would be of most utility for future stock assessments.

High Priority

- Surveys to track abundance in Southern New England (SNE) during all life stages (settlement, recruitment to legal size, exploitable abundance, and spawning abundance) are essential for future stock assessments and potential management advice. Current surveys are not adequate for these goals.

- Research should be conducted to provide a more comprehensive understanding of recruitment dynamics, including tracking of spatio-temporal settlement dynamics and the source of recruitment to offshore SNE, to inform development of Jonah crab settlement surveys.

- Appropriate survey methodologies need to be researched to track abundance of Jonah crab. Trawl surveys are available, but encounter rates are very low and detection ability is uncertain. Behavioral interactions with survey gear need to be better understood. Video surveys are recommended to examine these interactions. Video surveys could also be used for snapshot estimates of total stock size (i.e., swept-area biomass) that could be used to gain a better understanding on exploitation levels.

- Female migration pathways/seasonality and distribution needs to be researched. Anecdotal information suggests seasonal aggregations in inshore areas, but research would help to understand these mechanisms and inform connectivity. Ventless trap surveys (state-run and windfarm impact) offer a potential data set to explore interannual variability in distribution

- Information on larval duration in the field, mortality, and dispersal are needed to better understand possible connectivity. Spawning female distribution information would supplement efforts to model these processes. Evaluate larval data sets for species identification and to explore abundance, seasonality, and interannual variability.

- Inter-molt duration of adult crabs is currently unknown and growth increment data for mature crabs is limited. There are no growth data from offshore SNE where the bulk of

the fishery occurs and differences in growth between regions are unknown. These data will be necessary for advanced modeling methods.

- Research growth mechanisms for both sexes (e.g., potential for terminal molt, lack of growth associated with molting, high natural mortality for adults) to explain lack of exploitation signal (i.e., lack of size structure change) in available data sets. Dissection of larger crabs with old shells and evaluation of shell formation underneath external shell might help inform this research.

- Increase and improve the consistency of fisheries-dependent monitoring and biosampling. Sampling intensity by statistical area should be based on landings.

- Continue to improve accuracy of commercial reporting to improve quantification of effort in the directed and mixed-crustacean fisheries. Evaluate new spatial data (i.e., vessel tracking data) to better understand spatial dynamics of the fishery.

- Study the effect of temperature on Jonah crab behavior/activity.

- Little is known about ecosystem/environmental drivers of Jonah crab population dynamics. Studies should be done to identify and understand these drivers.

- Determine how to interpret fisheries-dependent data considering interactions between fishery response to abundance, economic drivers, and lobster fishery dynamics.

Moderate Priority

- Explore historical data sets from the scallop dredge survey and video surveys like HabCam to understand habitat use/suitability, abundance, distribution, and to inform potential covariates for catchability effects.

- Food habits data should be analyzed, with an emphasis on offshore areas, to better understand predation of Jonah crab and as a potential measure of abundance and distribution.

- Evaluate evidence for a defined stock-recruit relationship or lack thereof. If lack of evidence, identify recruitment drivers and mechanisms of population abundance change.

Low Priority

- Information should be collected to help delineate stock boundaries and understand possible connectivity, with an emphasis on the Gulf of Maine (GOM)/SNE boundary.

- Reproductive studies pertaining to male-female spawning size ratios, the possibility of successful spawning by physiologically mature but morphometrically immature male crabs, and potential for sperm limitations should be conducted.

- If improved abundance data with higher encounter rates becomes available, cohort tracking analyses should be conducted across and within surveys to better understand if

surveys are tracking true abundance signals and provide information on growth, mortality, and other demographic factors.

- The development of aging methods or determination of the mechanism responsible for the suspected annuli formation found in the gastric mill should be explored.