Predicting blue crab (Callinectes sapidus) fisheries independent survey abundances and commercial landings in Charleston Harbor, South Carolina

Marked high fluctuations in blue crab (*Callinectes sapidus*) seasonal and annual abundance, and commercial landings are typical, but data from both fisheries independent and dependent surveys show declines in populations in recent years in South Carolina. Despite several long-term fisheries independent surveys encountering blue crab, predictive models have not recently been developed in South Carolina to quantify variation in abundance and commercial landings. The goal of this study is to assess the current status of blue crab in SC and explore the potential for developing a more predictive understanding of commercial landings. This goal is me through the following objectives: 1) assess long-term trends in blue crab landings and fisheries-independent abundance, 2) test the applicability of a juvenile index, where juvenile abundance in one year predicts adult abundance in a following year, 3) explore predictive relationships between fisheries-independent abundance and commercial landings. Data from several long-term South Carolina Department of Natural Resources (SCDNR) fisheries independent blue crab surveys were standardized for each of six surveys and commercial landings data were compiled. Analyses testing the application of a juvenile index of abundance show that no juveniles collected in surveys explain variation in annual survey abundances. The Creek Trawl survey was the only survey with significant, but weak, correlative relationships between multiple lagged population structure variables and its own annual abundance. Significant relationships were found with effort-corrected commercial landings predicted by the previous year’s abundance of male crabs. This relationship was significant for immature crabs collected in the Harbor Trawl survey, and for mature crabs collected in the Creek Trawl survey. These results suggest effective population sampling, but a potential influence on abundance of blue crab from outside factors such as fishing, habitat or environmental variables.

Stevie,

Thank you for sending these documents. As we have previously outlined for Chapter 1, I encourage to keep your three objectives front and center as you work through the development of your thesis. To that end, I have attached an edited abstract that incorporates each of your objectives explicitly, and then presents results that are specific to those objectives. If these objectives have changed, this need to be made clear. Once you prepare to write your thesis, I would like for you to use sub-headings that explicitly denote your objectives. This would start in your methods, when describing statistical analyses where analytical descriptions for each objective are located in a separate paragraph with subheadings for each objective. Your results and discussion should also include subheading for each separate objective. This should greatly streamline the development of your thesis and should help to frame which figures/tables you would like to include.

For the next step in your thesis I would like to see a single PDF document with an updated abstract analogous to the one attached, and a list of tables and figures for your thesis. It looks like figures 2 and 3 will need to be combined into a single 6-panel figure. If you remove the figure titles and equations, and remove the axis label and year from every panel except the bottom one, you may be able to achieve this nicely. In addition, figure 1B is redundant, I suggest removing it. For table 6, take a look and be sure to include some additional specifics regarding surveys or data source.

For each applicable table/figure, it should be made explicit which objective those data are meant to address. In addition, please update the captions to provide a 1-2 sentence overview of how the data presented relate to its relevant objective. Once we can pin-point these tables into a specific objective, it will be much easier to decide which information should be included, and how it should be presented.

I look forward to seeing the next iteration of this document from you. I hope you can tell from my fast turnaround on this abstract that I am keen to help you move this process forward in an efficient fashion

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Michael R. Kendrick, PhD