|  |  |
| --- | --- |
| **I/UCRC Executive Summary** | **Date**: April 15, 2020 |
| **Title:** Understanding the utility of archived tag-recapture data for evaluation of movement and mortality estimation | |
| **PI: Robert Leaf** | |
| **Center/Site**: Science Center for Marine Fisheries (SCeMFiS) | |
| **Statement of Problem**: A high priority research need for improving the assessment of Gulf Menhaden include  understanding stock structure, individual growth dynamics, and improving estimates of natural mortality. One  of the primary ways that mortality and growth can be understood is through tagging and recapture of  individuals (Leaf et al. 2007, Leaf et al. 2008). Similarly, migration and stock delineation have also been  described with such tagging studies. Because of the power of tag and recapture studies for understanding stock  dynamics, the Gulf Menhaden Stock Assessment report further recommended replicating the tagging work  performed by NOAA scientists, which were extensive: Pristas tagged 75,000 *B. patronus* from 1969 to 1972  and Ahrenholz tagged 237,000 *B. patronus* from 1970 to 1985. These studies involved tagging juveniles and  adults with internal, individually-numbered ferro-magnetic tags that were recovered on magnets in fish  reduction factories. Because of the costs of such studies, it is unlikely that such a large-scale tagging study will  ever be performed again. However, leaps in the computational power and statistical modeling approaches in  recent decades has made re-analysis of the previously collected data a very worthwhile endeavor. Currently,  the data from these tagging studies reside as paper copies kept at the Southeast Fishery Science Center, Beaufort, NC and are not available for digital analysis. | |
| **Deliverables**: We propose to partner with NOAA scientists at the Beaufort Lab, who have agreed to support our efforts. We will perform exploratory analysis to understand the feasibility of a comprehensive reanalysis of the tag and recapture data. Our primary focus will be to catalog, organize, and summarize the paper records held by NOAA at Beaufort. The primary focus will be to evaluate the paper data for completeness for the Gulf of Mexico Menhaden Stock. Milestones include (1) acquisition of necessary, existing data resources, (2) Quality assurance and quality control, (3) Evaluation of utility. | |
| **Status relative to deliverables:** We have made substantial progress in deliverables 1 and 2 (3 is contingent on the previous two deliverables). Kasea Price traveled to Beaufort, NC and was hosted by Amy Scheuller at The NOAA Southeast Fisheries Science Center. She was there from September 30th to October 4th. During her visit, she spent the week sorting through Gulf Menhaden tag/recapture data. She found there were juvenile and adult data sets. These documents were scanned using an Epson DS-50000 Large-Format Document Scanner. We have cataloged the data and have started to evaluate its utility (milestone 3). We have scanned all documents and are now entering them into a data base.  The data components (binders of print outs) include:   1. Adult Field – Gulf: Tag and recapture data 2. Adult Field Recoveries 3. Juvenile Field and First Fishing 4. Juvenile Field Recoveries   There were some superfluous and some data that could not be assigned and we will not digitize these. | |
| **Summary of results relative to deliverables:**  The preliminary results of our analysis, in terms of the completeness of the data, is encouraging. We have summarized the results from the Adult sampling and there are many fish that were released and many were recaptured after months or seasons at large.  We are working to digitize the records for the juvenile component of the population.  These preliminary results are encouraging. In order to estimate natural mortality rates we need sufficient number of fish tagged and sufficient number of recaptures (2 to 11% that we observe is great). | |
| **Challenges to project completion and recommendations addressing the same**:  Thus far the main challenge has been the speed of data entry. I have tasked one technician and an undergraduate volunteer to perform data entry. The addition of the volunteer has helped immensely. Once we have digitized all records, we will move to the third deliverable.  Although, I would characterize the adult component work to be very positive – the juvenile data have yet to be transcribed (though we have scanned these records). I cannot comment on the quality (in terms of numbers tagged and recaptured) yet.  Given the progress we have made, the final deliverable will be attainable by the estimated knowledge transfer date, April 30, 2020. | |