Red Drum (*Sciaenops ocellatus*) distribution in south Texas water systems

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Abstract

Red Drum (*Sciaenops ocellatus*) are a species of great recreational significance in south Texas. Due to previous heavy fishing the species is regulated and monitored for depletion mitigation efforts, as it constitutes as a vital resource. Despite their significance, the amount of research/studies done on the species in the southernmost area of Texas is lacking. To better understand/protect Red Drum and their habitat there needs to be a greater understanding of their utilization of the water systems of south Texas. The goals of this project are to portray their distribution in these water systems through scatter plots. The most efficient method of capture as well as length class will also be assessed through both scatter plots and histograms.

1 Introduction

Red Drum, also referred to as red fish, are a popular game fish in coastal waters ranging from Massachusetts to Mexico and are of great recreational/commercial significance. In the 1970's heavy, unregulated fishing contributed significantly to a decline in the populations of Red Drum (Love et al., 2013) This decline also resulted in the closing of commercial fishing in federal waters around the later 1980's for the species. Red Drum are currently state-managed due to their status as a highly sought after game species. Hatchery programs implemented for stock enhancement and research purposes are maintained by some Gulf states in efforts of population maintenance(Love et al., 2013). This species spawns primarily in the Gulf of Mexico. Surface currents then transport the larvae to estuaries where they will continue the maturation process until fully mature resulting in movement offshore(TPWD, 2010). Comparatively within the state of Texas, there is a lack of studies of Red Drum in the southernmost area. They are a significant species that utilize the water systems of south Texas for nursery grounds/spawning purposes. A characterization of their distribution in the water systems of south Texas can begin the process of fulfilling the area's knowledge gap and offer insights into their habitat utilization. Such understanding will be beneficial in the innovation of management techniques for

this species. The data obtained from this project may also prove valuable for improving fisheries management practices to mitigate future resource depletion as Red Drum are a recreationally highly sought after species by the extensive population of fisherman that occupy south Texas. This species also serves as a vital food source for the high rate of people living in poverty that inhabit the area as well.

2 Methods

With 10-year time series capture data acquired from Texas Parks and Wildlife, I will utilize Python to show distribution of Red Drum along a longitudinal/latitudinal gradient in the water systems of south Texas with the intent of identifying potential aggregation sites. I will also determine which capture method (bag seine, gill net, or bay trawl) was most effective for the species as well as assess distribution of length classes. To achieve this I will construct scatter plots for each methodology through the entirety of the time series. In addition, scatter plots grouped by months will be constructed along with histograms for the size class assessment.

3 Timeline

11/15/19 – Find more info on data
11/19/19 – Extract coordinates from KMZ/load into pandas
11/21/19 – Make scatter plots/histograms
11/25/19 – Continue working with scatter plots/histograms
11/26/19 – Make presentation/ begin writing report
12/4/19 – Have presentation finished/loaded onto github
12/10/19 – Have report finished/loaded into github

4 References

1. Davis, J. T. (1990). Red drum: Biology and life history. (Southern Regional Aquaculture Center Publication No. 320).College Station, TX: Texas AM University. Retrieved from https://srac.tamu.edu/index.cfm/event/getFactSheet/whichfactsheet/59/

2. Love, M., Baldera, A., Yeung, C., Robbins, C. (2013). The Gulf of Mexico Ecosystem: A Coastal and Marine Atlas. New Orleans, LA: Ocean Conservancy, Gulf Restoration Center

3. Texas Parks and Wildlife Department (TPWD). (2010, August 26). Red Drum (Sciaenops ocellatus). Retrieved from http://www.tpwd.state.tx.us/huntwild/wild/species/reddrum/

2.jpg

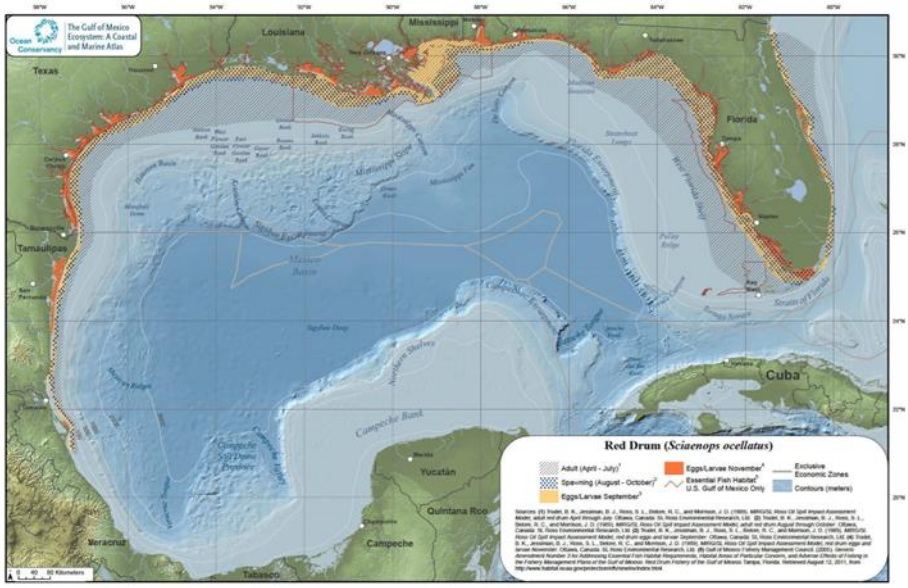

Figure 1: Map of the Gulf of Mexico