Reproductive Dynamics of Sheepshead, *Archosargus probatocephalus,* in South Texas

La Pesca Recreativa y la Agregación de Desove de Sheepshead, *Archosargus probatocephalus*, en el Sur de Texas

La Pêche Récréative et L'agrégation de Frai de Sheepshead, *Archosargus probatocephalus*, dans le Sud du Texas

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EXTENDED ABSTRACT

Sheepshead (*Archosargus probatocephalus*) is a coastal marine fish that is common throughout the Gulf of Mexico (Jennings 1985). It is a valuable component of inshore recreational fisheries in most regions within the Gulf, including the coastal areas of South Texas (NMFS 2006). However, there is a dearth of detailed information on their reproductive dynamics and the importance of their spawning aggregations to regional fisheries, despite the importance of such information for assessing the status of the fishery. Sheepshead aggregate to spawn in the late winter and early spring around jetties, channel passes, and reefs (Jennings 1985). In Port Aransas, Texas, the jetties that surround the Aransas Ship Channel represent a popular location for recreational fishing of Sheepshead. Our study investigated temporal patterns of Sheepshead spawning and coincident fishing activities at this location. Our specific objectives were to:

i) Characterize the spawning season and estimate spawning periodicity and frequency,
ii) Characterize the size and age distribution of the fishery, and
iii) Combine these data with landings data to conduct a data-poor assessment of the fishery and understand the importance of the spawning season to the recreational fishery.

Fish carcasses with gonads intact were collected from public fillet stations and recreational fishers on a daily basis from February through June 2016. The sex and reproductive condition of each fish sampled was first determined by macroscopic inspections of gonads and later verified by microscopic evaluations of gonad tissue sections prepared using standard histological procedures (Brown-Peterson et al. 2011). Actively spawning designations were made only when oocytes were visibly hydrated. Sagittal otoliths were also extracted and used to age each fish. A simple analysis of the status of the fishery was conducted using a length-based reference system that uses size at maturity to assess overfishing (Cope and Punt 2009). We evaluated the importance of Sheepshead spawning to the fishery by comparing seasonal trends in landing data gathered by NOAA's Marine Recreational Information Program (MRIP) to the estimated spawning season.

We collected a total of 733 samples over the study period. The fork length (FL) of sampled fish ranged from 257 to 533 mm with an average of 378 mm FL (Figure 1). Visual and microscopic examinations of female gonads indicated that

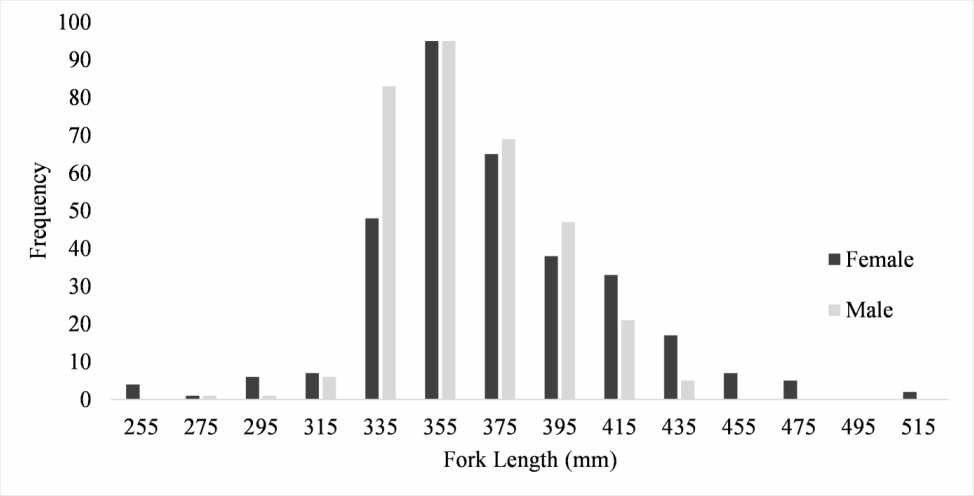

Figure 1. Size distribution (n = 733) of male and female Sheepshead (*Archosargus probatocephalus*) collected from the recreational fishery in Port Aransas, TX from February to June 2016.

spawning occurred on a daily basis from early March through mid-April (Figure 2), with individuals estimated to spawn every 4 days. Spawning occurred over a sea surface temperature range of 20 ºC to 23 ºC, and we found no evidence of a lunar rhythm in spawning activity. Using data from MRIP, it was determined that the average percent of recreational landings of Sheepshead peaked during the months of March and April from 1986 to 2016. More than 60% of the annual catch for Sheepshead in Texas occurred from February to May, indicating that spawning aggregations of Sheepshead are an important component of the fishery. All fish collected were larger than mean length at sexual maturity (250 mm FL), and 45% of our samples were within the optimal length of 304 mm to 372 mm fork length. Moreover, our preliminary analysis on the size structure and spawning potential ratio of the fished population indicated that overfishing was not occurring.

KEYWORDS: Recreational fishery, visual assessment, spawning season

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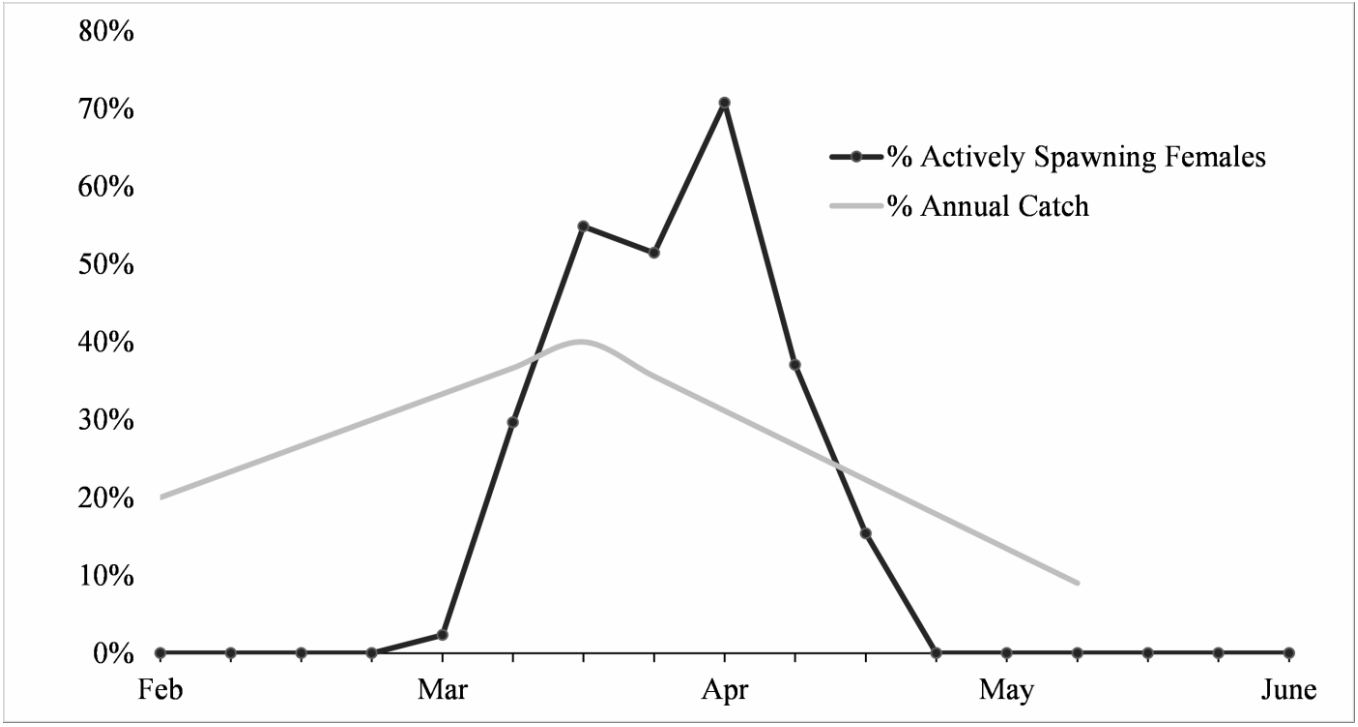

Figure 2. Percentage of actively spawning female Sheepshead (*Archosargus probatocephalus*) collected during each week (n = 733) from the recreational fishery in Port Aransas, Texas from February through June 2016. Average percent recreational landings in Texas by wave 1986 - 2016.