Researchers publish manuscript on red snapper reproduction

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Recent research conducted on the long-term issue of age distribution of red snapper in the Gulf of Mexico indicates that older fish, age eight and up are more reproductive than younger fish were over the previous 10 years. The research was conducted by James H. Cowan, LSU College of the Coast & Environment, Department of Oceanography and Coastal Sciences professor, and current and former graduate students Dannielle Kulaw and Melissa Woods Jackson.

In studies done a decade apart, evidence shows a recent shift toward a slower progression to sexual maturity as well as reduced egg production, especially among young, small female red snapper, in the Gulf of Mexico. Slower maturation rates among young fish ages two to six, lower gonadosomatic index, or GSI, values - a tool for measuring the sexual maturity of animals—and decreased spawning frequency were observed, and were especially pronounced in the northwestern Gulf. Furthermore, an Index of Reproductive Importance showed that young fish have been contributing far less to the spawning stock in recent years, while older fish, age eight and up, are contributing more, when compared to fish from the same age groups sampled in the previous decade.

Coincident with these changes in reproductive output, fishing pressure has steadily declined gulf-wide, and spawning stock biomass and spawning potential ratio have increased. Thus, it is possible that the age structure of the red snapper stock is becoming less truncated, or that reproductive efforts observed are due to the temporary influence of

recent strong year classes—fish born in the same year—produced in 2004 and 2006 as they begin to reach full reproductive potential. If the latter is true, careful documentation of the stock's reproductive dynamics during a time of population growth provides new understanding at the meta-population spatial and decadal temporal scales. In contrast, if the former is true, a truncated age structure due to overharvest can limit the productivity of the Gulf red snapper stock. In addition, it was discovered that red snapper females in the northwestern Gulf collected on natural reefs and banks have much higher reproductive output than those on artificial reefs.

Their manuscript, "Temporal and Spatial Comparisons of the Reproductive Biology of Northern Gulf of Mexico (USA) Red Snapper (Lutjanus campechanus) Collected a Decade Apart," has been approved for publication by *PLOS ONE*.

More information: Dannielle H. Kulaw et al, Temporal and spatial comparisons of the reproductive biology of northern Gulf of Mexico (USA) red snapper (Lutjanus campechanus) collected a decade apart, *PLOS ONE* (2017). DOI: 10.1371/journal.pone.0172360

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