USING SOUND RECORDINGS TO DETERMINE THE LENGTH OF ATLANTIC CROAKER (*Micropogonias undulatus*)

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Sciaenid fishes are known for their soniferous abilities, which allow them to communicate with each other through the use of sonic muscles and a swimbladder. Passive acoustics (hydrophone listening stations) have recently been suggested as a method for remotely monitoring the presence and relative abundance of fishes. With Atlantic croaker (*Micropogonias undulatus*), both sexes as well as juveniles are able to produce these sounds. The purpose of this research is to characterize the acoustic abilities of Atlantic croaker and determine if differences exist between life stages. An InterOcean model 902 hydrophone and Sony DAT recorder were used in the field to record individual Atlantic croakers (n=17) sound under water in a 20-L bucket for a 60-s period. Recordings from digital audio tapes were converted to computer *.wav files at 44 kHz using a sound card. Recorded sound files were analyzed using Matlab signal processing/spectral analysis toolbox to get spectrograms and dominant frequency rates for each fish. After the recording, each fish was sacrificed, measured for total length and weight, dissected to measure sonic muscle mass and to determine sex. Spectrograms, oscillograms, and average power spectra will be presented for representative fishes between 59 and 211 mm total length. There was an inverse relationship between length and dominant frequency ($r = -0.77$). A linear regression indicated that dominant frequency (Hz) of Atlantic croaker sounds can be a useful predictor of the total length (mm) of an Atlantic croaker; where total length = -0.1249 (frequency) + 2.2889 (R^2=0.599). We conclude that the size of Atlantic croaker can be predicted with reasonable accuracy from field hydrophone recordings. Passive acoustics methodology, along with such ground trouping information from captive fish, will aid in the measurement of species presence or absence, size, and ultimately sex data for the Atlantic croaker population.