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TROPHIC DYNAMICS OF THE SOUTHEAST FLORIDA, USA COASTAL PELAGIC FISH COMPLEX

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The waters off the southeast coast of Florida are home to a rare coastal pelagic ecosystem where multiple top and mid-level teleosts are present. These teleosts, particularly scombrids such as tunas and wahoo, are primarily targeted by recreational anglers. However, there is a shortage of available trophic and diet composition data concerning fishes of the coastal pelagic ecosystem.

The objective of this research project is to investigate and achieve a greater understanding of coastal pelagic fishes, with an emphasis on the higher order species that inhabit the mid-range coastal pelagic to true pelagic waters, and the ecological role they play within the community ecology of the pelagic ecosystem. The selected fish species includes king mackerel (Scomberomorus cavalla), blackfin tuna (Thunnus atlanticus), skipjack tuna (Katsuwonus pelamis), Atlantic bonito (Sarda sarda), little tunny (Euthynnus alletteratus), wahoo (Acanthocybium solandri), and dolphinfish (Coryphaena hippurus). These species were selected based on their position as upper trophic level predators in the marine ecosystem food web and their general habitat distribution in the coastal pelagic zone.

In the two year period between March 2010 and March 2012, approximately 400 fish from the seven species have been sampled. The samples were collected opportunistically from recreational tournament anglers in the south Florida region between West Palm Beach and Key West. The stomach, gonads, muscle tissue, and liver tissue were collected from each specimen, as well as length (standard, fork, and total) data. Specimen sex was determined by gonad examination. Stable isotope analysis was performed with the muscle tissue samples using carbon $\delta^{13}C$ for dietary assimilation comparison and nitrogen $\delta^{15}N$ for trophic position. Stomach content analysis was performed with the frequency of occurrence, percent composition by number, percent composition by weight, and IRI indices used for a quantitative description of the diet. The stomach content analysis results are compared with the stable isotope values to evaluate the trophic interactions and trophic position among the coastal pelagic community.

The preliminary analysis of stomach contents shows that the fishes of this complex feed on a diverse diet of fish, squid, and crustaceans. However, the $\delta^{13}C$ data suggest that blackfin tuna (-16.5 to 20.5) has a greater spatial diet range compared to little tunny (-16.5 to -17.5) and skipjack tuna (-17.0 to -18.0). The king mackerel $\delta^{13}C$ data suggest a similar spatial diet range to the blackfin tuna. The wahoo stomach content analysis a diet exclusively of squid, which is supported by the $\delta^{13}C$ and $\delta^{15}N$ data. An examination of the $\delta^{13}C$ and $\delta^{15}N$ data together illustrates differences in trophic position and prey assimilation among the species in the coastal pelagic complex. Additional sampling and data analysis to evaluate the trophic dynamics of the coastal pelagic complex is ongoing.