

Assessment history of black grouper (*Mycteroperca bonaci*) in the southeast U. S. waters.

Robert G. Muller
Florida Fish and Wildlife Conservation Commission
Fish and Wildlife Research Institute
St. Petersburg, FL

Black grouper are included in the Snapper-Grouper Fishery Management Plan but black grouper only comprise a regional fishery as they are caught primarily in south Florida. The stock assessment history for black grouper in the southeast U.S. waters is brief. Black grouper have not had a formal stock assessment where all of the data and the model have undergone an outside review.

Huntsman and Mason (1987) examined the ages of 303 fish collected in the headboat fishery from south Florida and they estimated von Bertalanffy growth parameters and total mortality of black grouper with two catch curves including different ages. The first catch curve used fish aged seven and older and obtained a total mortality estimate of 0.53 per year and the second used fish of ages 5 and older and obtained a total mortality estimate of 0.49 per year. The oldest fish that they observed in their samples was 14 years old although they speculated that the maximum age of black grouper could be three to five years older. They also noted that the yield per recruit could be increased by increasing effort and lowering the minimum size.

Huntsman et al. (1994) did a similar analysis with fish that were collected in 1988 from both commercial and recreational fisheries and estimated fishing mortality at 0.32 per year and a spawning stock ratio (spawning potential ratio) of 37% and concluded that the stock was not overfished. This exercise was repeated using data from 1990 (Huntsman et al. 1991) and the fishing mortality was 0.20 per year and the SPR was 43%. They also noted that yield per recruit could be increased by increasing effort and raising the minimum size to 26 inches.

Ault et al (1998) used the estimated lengths from the National Marine Fishery Service-University of Miami's Reef Visual Census to determine total mortality for black grouper and SPR value. Their estimate of SPR was approximately 6%. However, their samples came from diver observations on the coral reefs in the Florida Keys and they did not have access to all ages of fish and, consequently, the SPR was biased.

Potts and Brennan (2001) presented a summary of the status of snapper-grouper species for the South Atlantic Fishery Management Council using commercial as well

as recreational fishery data and they found the black grouper stock to be overfished (SPR = 10%, range 0.58-15%) with a fully recruited fishing mortality estimate of 0.60 per year and a natural mortality of 0.15 per year. Unfortunately, they did not provide details on how the landings were aged, the number of fish at age, nor which ages were included in their catch curve.

Accounting for selectivity is very important in determining the condition of black grouper as illustrated by the Manooch and Mason and the Ault et al studies. Unfortunately, regulations reduced the longline fishery for reef fish in the South Atlantic in 1992 to beyond 50 fathoms and eliminated it for reef fish other than deep water species in 1999. Without the larger fish from the longline fishery, the sizes and ages of black groupers in these studies were truncated and produced biased estimates of total mortality because the mortality estimates included the loss of fish from nearshore waters as they moved further offshore to deeper waters. When data from longlines were included in black grouper catch curves, the estimates of total mortality declined (Muller 2009, SEDAR19-AW-06).

Given the marked difference between the conclusions from these early analyses, and given the advances in the life history information over the past two decades, it is prudent to move from yield per recruit, catch curves, and mean length models to more complex models that integrate more sources of information.

Literature Cited

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