

**Red Snapper Life History in the Gulf of Mexico:
A Primer from [Reef Fish Amendment 50A](#)
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Red Snapper Life History and Biology

Red snapper demonstrates the typical reef fish life history pattern. Eggs and larvae are pelagic (Lyczkowski-Shultz and Hanisko 2007) while juveniles are found over mud bottom and oyster shell reef (Szedlmayer and Conti 1999; Rooker et al. 2004). Red snapper larval transport vectors westward in nearshore waters during September, October, and May, and eastward in deeper waters beyond the continental shelf break in June, July, and August (Johnson et al. 2009). Red snapper is associated with both natural and artificial habitats (Wilson and Nieland 2001; Szedlmayer and Lee 2004; Glenn 2014; Karnauskas et al. 2017) but larger, older fish occur over open habitat in deeper water (Gallaway et al. 2009). Spawning is protracted from April through September throughout the Gulf, with peak spawning in June through August (Futch and Bruger 1976; Collins et al. 1996). Adult females mature as early as two years and most are mature by four years (Schirripa and Legault 1999). Red snapper has been aged up to 57 years (SEDAR 31 2013). Porch et al. (2015) documented higher frequency of spawning for larger, older fish, approximately age-8 and older. Until 2013, most red snapper caught by the directed fishery were 2 to 4 years old, but the SEDAR 31 stock assessment suggested that the age and weight of red snapper in the directed fishery has increased (SEDAR 31 2013). This trend was found to be similar in the following stock assessment of red snapper also (SEDAR 52 2018). Red snapper adults exhibit high site fidelity on artificial reefs, with long-term residency exceeding 2.5 years in some cases (Szedlmayer and Shipp 1994; Strelcheck et al. 2007; Topping and Szedlmayer 2011). However, other conventional tagging studies have suggested the occurrence of hurricanes can greatly affect the magnitude of red snapper movement (Patterson et al. 2001).

Status of the Red Snapper Stock

SEDAR 52 2018 Assessment

Biomass estimates show the western Gulf population continues to rebuild, while the eastern Gulf population has leveled off over the last few years. The number of older fish present has increased Gulf-wide, indicating rebuilding age structure. The Gulf red snapper stock is not considered to be overfished (spawning stock biomass [SSB]/minimum stock size threshold [MSST] = 1.41) or undergoing overfishing (current fishing mortality rate [F]/maximum fishing mortality threshold [MFMT] = 0.823), but will not be rebuilt (i.e., $SSB_{Current}/MSST = 2.00$) until 2032.

Definition of Overfishing

In January 2012, NMFS implemented the Generic ACL/AM Amendment (GMFMC 2011). One of the provisions in this amendment was to redefine overfishing. In years when there is a stock assessment, overfishing is defined as the fishing mortality rate exceeding the maximum fishing mortality threshold. In years when there is no stock assessment, overfishing is defined as the

catch exceeding the OFL. The SEDAR 52 (2018) update assessment indicates that, as of the terminal year of the assessment data, overfishing was not occurring. Note that, because the overfishing threshold is now re-evaluated each year instead of only in years when there is a stock assessment, this status could change on a year-to-year basis.

Definition of Overfished

The MSST is the spawning stock biomass (SSB) level at which a stock is declared overfished and a rebuilding plan must be implemented. MSST for red snapper was previously estimated using the formula $(1-M)*B_{MSY}$, where M is the natural mortality rate and B_{MSY} is the stock biomass level at which the maximum sustainable yield (MSY) can be harvested on a continuing basis. Using this formula, red snapper was considered overfished through 2017. Amendment 44 changed the calculation for the red snapper MSST to be 50% of B_{MSY} . The resulting estimate of MSST reclassified red snapper to not overfished but rebuilding. Therefore, despite the reclassification, the rebuilding plan for the stock remains in place until the stock has recovered to its B_{MSY} (GMFMC 2017).

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Many publications related to red snapper, as used in recent SEDAR Assessments, can be found here:

- SEDAR 31 Benchmark Assessment: <http://sedarweb.org/sedar-31>
 - SEDAR 52 Standard Assessment: <http://sedarweb.org/sedar-52>
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