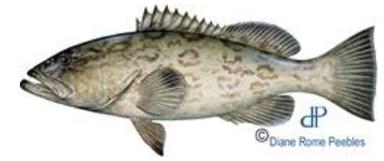
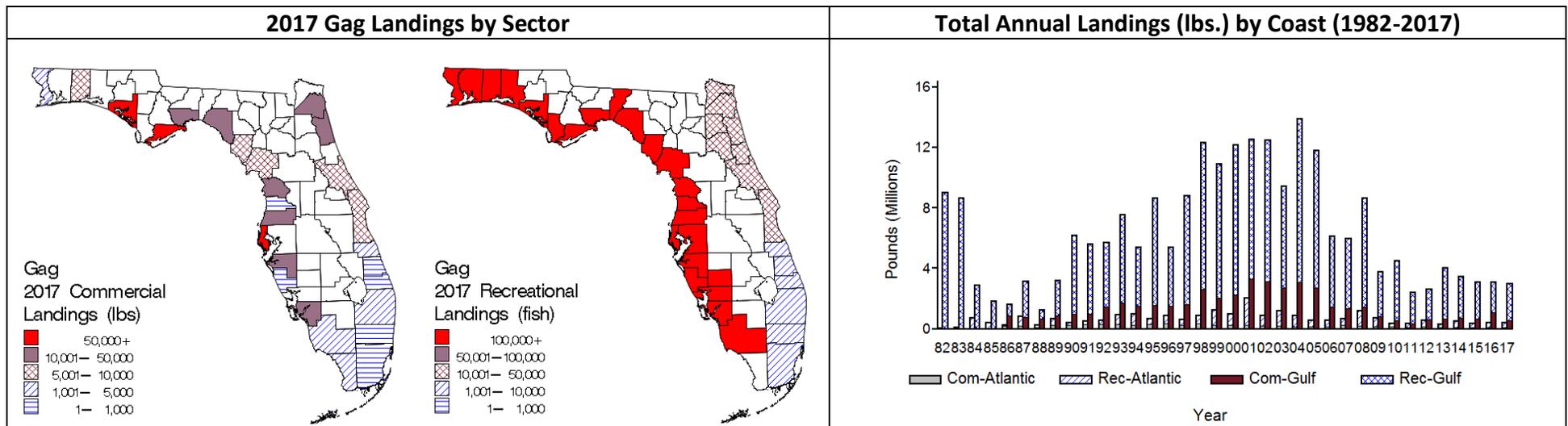


## Gag, *Mycteroperca microlepis* (Goode & Bean, 1879)

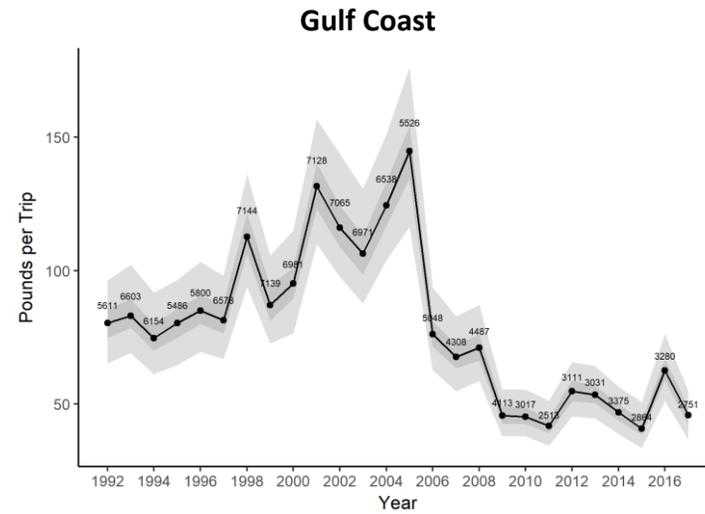
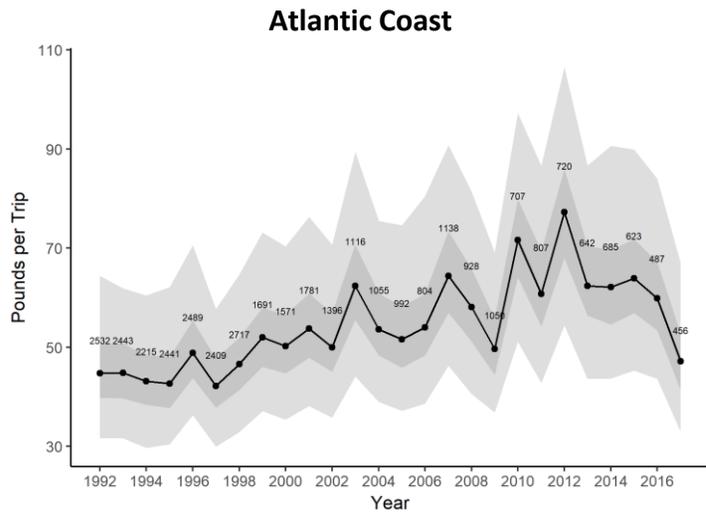


### Life History

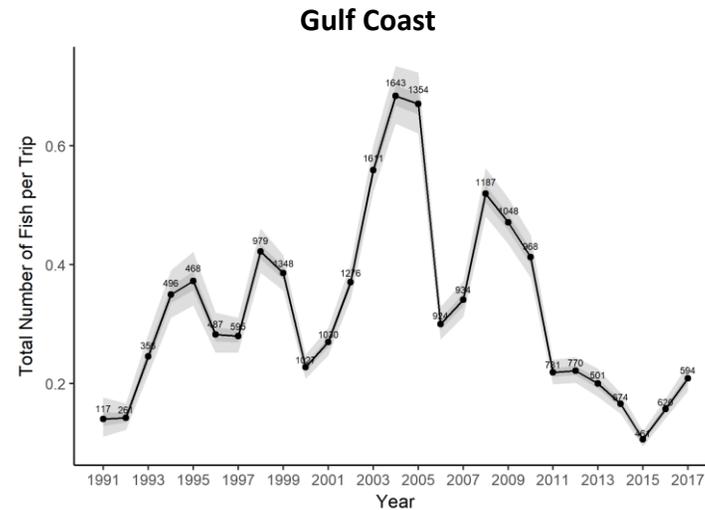
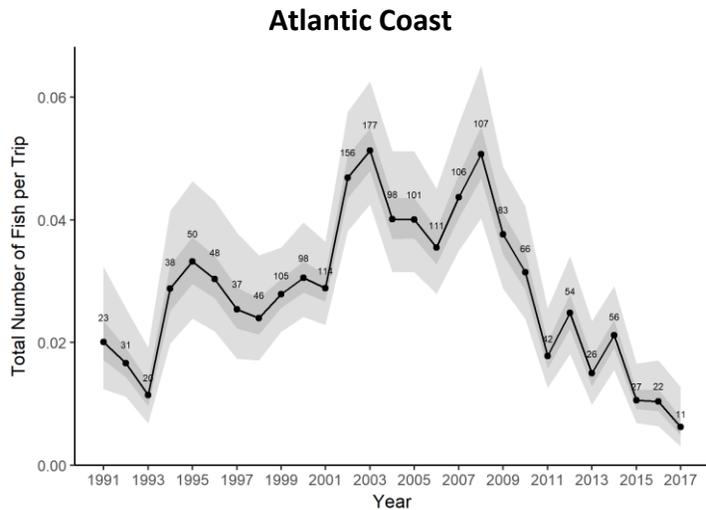
Gag are common grouper found in inshore seagrass beds as juveniles and on Florida’s reefs and hard bottoms (out to 500 foot depths) as adults. The species is restricted to the western Atlantic from Massachusetts southward to Florida, the Gulf of Mexico (GOM), and possibly to Brazil—excluding the West Indies (Bullock and Smith 1991). Genetic observations show differences between juveniles collected over their range between North Carolina and the Gulf of Mexico coast of Florida (Chapman *et al.* 1999). These differences could indicate that numerous local populations exist, that greatly reduced abundance has had genetic consequences, or that the distribution of reproductively successful females is patchy. Gag are protogynous hermaphrodites. Females mature between ages 3 and 6, approximately the time that they recruit to the fishery (Lombardi-Carlson *et al.* 2006). No males younger than about ages 5–7 are present in the population (Hood and Schlieder 1992; Collins *et al.* 1998). In the eastern Gulf of Mexico, spawning occurs from late December through April and peaks in February and April (Hood and Schlieder 1992, Bullock and Smith 1991; Collins *et al.* 1998). Peak spawning of Gag in the South Atlantic Bight occurs during late March–early April (Collins *et al.* 1987, McGovern *et al.* 1998). Gag can reach nearly 50” total length (TL) and achieve a maximum observed age of 21–22 years old (Collins *et al.* 1987; Hood and Schlieder 1992). Data on the stomach contents of Gag indicate that Gag are primarily piscivorous. They prey mainly on schooling fishes in the Clupeidae, Carangidae, Sparidae, Sciaenidae, and Mugilidae families (Naughton and Saloman 1985). There has been a long-standing issue with commercial fishermen misidentifying Gag as black grouper and greater effort has recently been made to address this. Consequently, landings for Gag have increased due, in part, to this correction and therefore any change in landings of Gag could be partially attributed to this.



Fishers landed 3,361,271 pounds in 2017 which were 7.9% lower than the previous 5-year average (2012-2016). Coastwide, 88.6% of these were from the Gulf and 11.4% were from the Atlantic. Recreational landings constituted 81.1% of the total landings.



**Standardized Commercial Catch Rates:** Atlantic coast commercial catch rates varied in an upward trend through 2012, decreased and stabilized, then decreased further through 2017. Gulf coast commercial landings rates increased through 2005, dropped sharply in 2006, and have continued to decline through 2017. Dark grey figure lines represent first and third quartiles while the light grey lines represent the 2.5% – 97.5% quantiles.



**Standardized Recreational Total Catch Rates:** Total catch rates for recreational anglers on the Atlantic coast have variably increased through 2002 to greater rates of catch through 2008, then declined to a timeseries low in 2017. On the Gulf, total catch rates variably increased though 2005 dropped sharply in 2006, increased through 2008, steadily declined through 2015, then another increasing trend in 2016-2017. Dark grey figure lines represent first and third quartiles while the light grey lines represent the 2.5% – 97.5% quantiles.

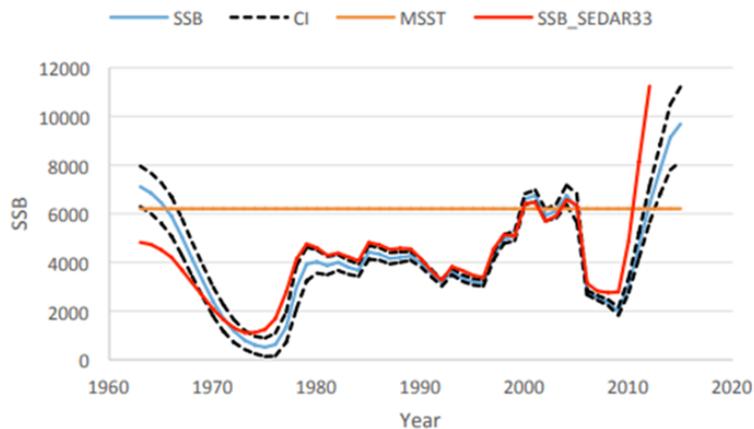
## Stock Status

**Current Condition:** south Atlantic – not overfished but undergoing overfishing; Gulf of Mexico – not overfished nor undergoing overfishing

**Management History:** Results from the most recent south Atlantic Gag Grouper update assessment (SEDAR 10 Update 2014) suggest that spawning stock declined until the mid-1980s and has since been relatively stable, fluctuating around MSST, with an upturn in the last several years. The terminal (2012) base-run estimate of spawning stock is near SSB<sub>M</sub>SY (SSB<sub>2012</sub>/SSB<sub>M</sub>SY = 0.97) and this level is above the MSST (base: SSB<sub>2012</sub>/MSST = 1.13). The estimated fishing rate has exceeded the MFMT (represented by FMSY) for most of the last three decades, but has been decreasing in the last several years with the 2012 estimate below the MFMT. The current estimate of fishing rate, which is based on a three-year geometric mean, is above FMSY in the case of the base run (F<sub>2010–2012</sub>/FMSY = 1.23) and the median (F<sub>2010–2012</sub>/FMSY = 1.37). Thus, this assessment finds that the stock is experiencing overfishing, but is not overfished.

The most recent benchmark stock assessment update for the Gulf of Mexico Gag Grouper (SEDAR 33 Update 2016) found that Gag Grouper have been overfished for the majority of the time-series (1966-1999, 2002-2003, and 2006-2011). In recent years, the model indicates that the Gag Grouper population has not been overfished. Similarly, Gag have experienced overfishing over the majority of the time-series (1974- 2010) but have not been experiencing overfishing since 2010. Comparisons of the current fishing mortality and MFMT indicate the stock is not experiencing overfishing and comparisons of the current SSB and MSST indicate the stock is not overfished. A retrospective analysis was carried out for the continuity model and a pattern was obvious with each peel of the new data. The estimates of SSB increased with each retrospective peel of a single year of data and the estimated age-0 recruits in 2007 declined with each retrospective peel. Retrospective patterns can be the result of over-parameterization, mis-specifying time-variant relationships (e.g., specifying selectivity as time-invariant), etc. and are recommended for examination during the next Gag Grouper benchmark assessment.

Gulf Gag Grouper SSB (SEDAR 33 Update)



Exploitation Rate for Gulf Gag Grouper (SEDAR 33 Update)

