Blue Crab, *Callinectes sapidus* (Rathbun, 1896)

**Life History**

In the western Atlantic, Blue Crabs are distributed from Nova Scotia south to northern Argentina, including Bermuda and the Antilles. Blue Crabs are an important link in the food chain, feeding on fish, aquatic vegetation, mollusks, crustaceans, and annelids while they serve as prey to mammals, birds, and fishes. The high level of genetic patchiness and gene flow found among Blue Crabs inhabiting Gulf and Atlantic estuaries suggests that little population sub-structuring occurs; although, latitudinal clines in allele frequencies may be maintained by selective forces operating over broad geographic scales (McMillen-Jackson *et al.* 1994). Blue Crabs grow to adult size, 3.9 – 9.4" carapace width, after 18 to 20 molts (Van Engel 1958). In the St. Johns River, where some Blue Crabs survive to four years of age, adult size is reached after one year (Tagatz 1968). Female Blue Crabs mate once in their lifetimes during the period March–December following their terminal molt. Size at maturity varies between about 2.0” and 7.0" carapace width (Steele 1979). After mating in the upper reaches of estuaries, females move to the mouth of the estuary or nearshore coastal waters to spawn. On the Gulf coast of Florida, females leave the estuary and move northward toward the Florida Panhandle region before spawning (Steele 1991).

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<th>2017 Blue Crab Landings by Sector</th>
<th>Total Annual Landings (lbs.) by Coast (1982-2017)</th>
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<td>![Map of Florida with landings data]</td>
<td>![Graph of total annual landings]</td>
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Fishers landed 6,783,971 pounds in 2017 which were 0.3% higher than the previous 5-year average (2012-2016). Coastwide, 63.1% of these were from the Gulf and 36.9% were from the Atlantic. Commercial landings constituted 100% of the total landings. There are no precise estimates of the size of the recreational fishery, but it may be substantial (Steele unpublished ms).

Standardized Recreational Total Catch Rates: There are no precise estimates of the size of the recreational fishery, but it may be substantial (Steele unpublished ms).
**Fishery-Independent Monitoring:** Indices of abundance for young-of-the-year (YOY) Blue Crab followed a cyclical pattern on both coasts, with peaks in 1998, 2005, 2011-2012, and 2016 on the Atlantic coast and in 1998, 2004, 2011, and 2017 on the Gulf coast. However, both coasts show long term decreasing trends. Abundance of post-YOY Blue Crab on the Atlantic coast varied followed similar patterns as observed in the YOY index with highs in 1998, 2000, and 2005. The post-YOY abundance index on the Gulf coast followed similar patterns as the YOY index with highs in 1998, 2006, and 2010. Post-YOY abundances in recent years on both coasts are increasing after being at or near historic lows.
Fish Health: Increased prevalence of gross external abnormalities on Spotted Seatrout ≥75 mm was noted on both coasts in 2009. Only a mortality abnormality was observed on the Atlantic coast in 2016 where fish were found dead prior to collection. No abnormalities were observed on the Gulf coast.
Stock Status
Current Condition: not overfished nor undergoing overfishing.

Management History: The Gulf States Marine Fisheries Commission developed a fishery management plan for Blue Crab (Steele and Perry 1990) and updated it in 1999 (Guillory et al. 2001). In the most recent plan recommended management actions included: minimum outside wall mesh sizes of 1.5” (corner to corner) hexagonal or 1.75” square mesh for hard crab traps, a 5” minimum size limit (except peeler crabs held for shedding), prohibition of the sale of egg-bearing females, a trap identification system, and the use of 2.375” escape rings. Guillory et al. (2001) concluded that there was no evidence of a decline in Blue Crab abundance in Florida; it was believed that the average historical landings might be a better estimate of maximum sustainable yield than that estimated by a simple surplus-production model. None of the “stock stress” indicators were detected using Florida data where, excluding 1998 data, no increase in total mortality and no decrease in relative abundance, mean carapace width or landings were observed. Population models provide evidence that Blue Crab in Chesapeake Bay were growth overfished (Tang 1983, Rugolo et al. 1997). While Blue Crab abundance was at average long-term levels in the Chesapeake, the expended effort needed to make the current landings there is too high, resulting in a less economically viable fishery (Rugolo et al. 1997).

Murphy et al. (2007) developed a stock assessment for Blue Crabs in Florida during 2002-2005. A catch survey analysis and a stochastic stock reduction analysis showed that the stocks on both coasts were most likely not being overfished during 2002-2005. However, a biomass dynamic model indicated that the fishery had been overfishing the stock on both coasts since the mid 1960’s or early 1970’s with respect to F_{MSY}. Cooper et al. (2013) developed a stock assessment for Blue Crabs in Florida through 2011. All three assessment models that were developed indicated that fishing mortality rates have trended downwards on both coasts since the mid- to late 1990’s, which follows the general trend in the number of traps fished over this time period. The general conclusions from the three analyses suggest that neither Florida coast is currently overfished nor undergoing overfishing. The primary assessment model estimated an MSY of 31.9 and 12.0 million crabs for the Gulf and Atlantic coasts, respectively. Although there were troubling gaps in Blue Crab life history and fishery information, a common feature of all the assessments was the finding that Blue Crabs in Florida appeared to be very resilient to high fishing rates and freshwater inflow can have a strong influence on their population dynamics, leading to large fluctuations in year-to-year abundance.