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**Striped Bass and Blue Crab Abundance in Chesapeake Bay
Are Striped Bass Negatively Impacting the Bay's Blue Crab Population?
For the Tidal Fisheries Advisory Commission
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Striped bass are opportunistic predators and will prey on many different species of finfish and shellfish including blue crabs in Chesapeake Bay. Diet studies of striped bass have shown that young blue crabs do appear in the stomachs of striped bass and indicate that in certain times of the year, there is a higher proportion of blue crabs in striped bass stomachs in years when blue crab reproduction is high such as 2012 (Figure 1). This would be a reflection of the large availability of young crabs relative to other prey. This pattern (striped bass consuming more young crabs when there are lots of young crabs) has likely repeated itself for thousands of years without detriment to the blue crab population. An examination of striped bass and blue crab abundance since 1990 supports this assertion by revealing no obvious connection between the abundance of the two species (Figures 2 and 3). This analysis is interesting and informative because both striped bass and blue crabs have experienced large substantial changes in abundance during this 23 year time period. This 'contrast' in the data allows us to observe the relationship under a broad range of population levels. We looked for a relationship between the two species by examining the estimated abundance of striped bass that are under the age of eight years (assumed to be primarily resident in Chesapeake Bay), and the estimated abundance of blue crabs in Chesapeake Bay. Striped estimates are from the October 2013 Atlantic States Marine Fisheries Commission Update of the 2012 Striped Bass Stock Assessment using Final 2012 Data (available on the ASMFC website); Blue crab estimates are from the annual Baywide Winter Dredge Survey. A statistical graph shows the relationship between the two populations (Figure 2) and indicates that across the range of striped bass abundance observed since 1990, blue crab abundance is equally likely to be high or low. Interestingly, blue crab abundances in the Bay have been highest at the extremes (low and high) of striped bass abundance.

It is important to note that the ecosystem should be a consideration in fisheries management. Opportunistic predators such as striped bass may shift to less preferred species when a preferred species is in low abundance. For example, the abundance of menhaden which is the preferred food of striped bass, is at an historically low level throughout its range. Striped bass may shift migration patterns and focus on alternate prey to compensate for a shortage of menhaden. An alternative to harvesting more striped bass would be to harvest fewer menhaden. However, each of these decision points has other consequences within the ecosystem. Therefore, the best approach is to manage each species according to its assigned biological reference points – a greater number of which are including predator-prey relationships.

Figure 1. Preliminary data from a striped bass diet study conducted by the Chesapeake Bay Ecological Foundation showing the diet composition in two size classes of striped bass during the months of October and November.

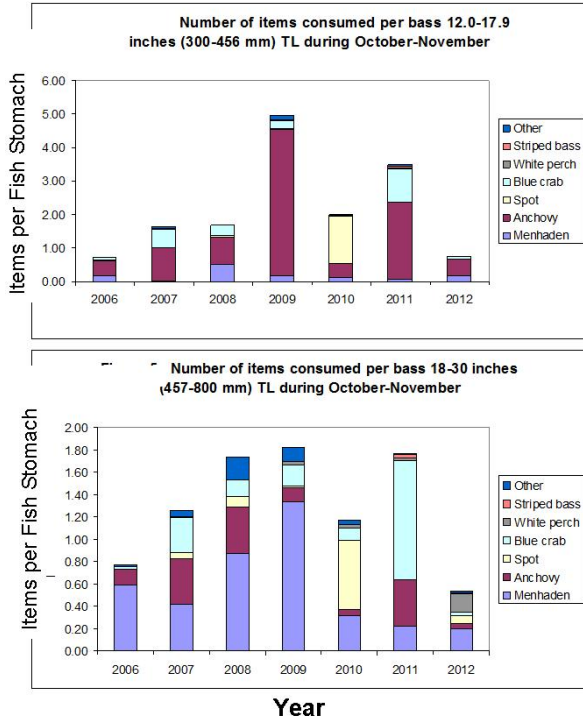


Figure 2. A statistical graph showing the relationship between the abundance of striped bass under age 8 and the abundance of blue crabs in Chesapeake Bay. The R2 value of 0.01 indicates that there is no statistical relationship between the two abundance levels.

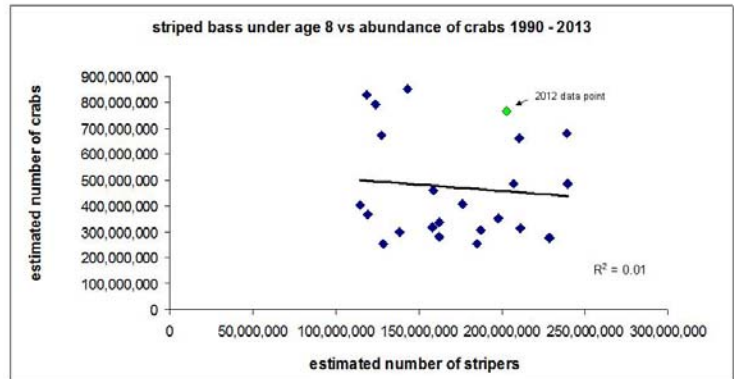


Figure 3. A line graph showing the estimated number of striped bass (less than age 8 years) and the estimated number of blue crabs in Chesapeake Bay between 1990 and 2012.

