**SIGNIFICANCE**

The seagrasses in the Bay are important because they are “one of the most productive and dynamic ecosystems globally” (McKenzie 2008). As stated before, the sea grasses of the Bay are in danger of drastically decreasing due to the mute swans, Chinese mitten crabs, and water chestnuts. Research has shown that these three invasive species in the Chesapeake Bay have had the most impact on the decrease (McKenzie 2008). “Ecologists, conservation biologists and managers widely believe that invasions by non-native species are the leading cause of recent species extinctions. The introduction and spread of non-native species have become a global ecological and conservation crisis as invasive organisms are increasingly altering terrestrial and aquatic communities worldwide” (Gurevitch 2004). Studying these three one at time will show the difference of how they affect the sea grass and how much damage they cause. Then, a conclusion will be made on which of the three is most detrimental to the underwater sea grass populations in the Chesapeake Bay.

Some of the gaps of the knowledge in this area of research include that there is not a true way to tell when the invasive species started to be invasive. Not only that, but the animals are hard to monitor. However, the sea grasses are monitored over time by looking at their color and widespread distribution (McKenzie 2008). In the experiments involving water sea grasses there are also no controls, this then causes the scientists to only be able to collect data and assume form the data and patterns to make connections (McKenzie 2008).

Aim 1) **If the mute swans continue to excessively eat seagrass, then the sea grass will be reduced.** This invasive species’ largest population is found int the Maryland portion of the Chesapeake Bay (Sousa et al. 2008). The mute swans also don’t migrate from the Chesapeake Bay which leads them to be dependent on the sea grasses all year round (Sousa et al. 2008).

Aim 2) **If the water chestnuts continue to block sunlight, then the sea grass will be reduced.** These plants have low food value (Naylor 2003). Not only will the sea grasses be affected, but the blockage of sunlight also causes less oxygen for the fish which could then kill them (Naylor 2003). “Water chestnut threatens native Bay grasses by forming a complete canopy with up to three layers of leaves, blocking all sunlight from reaching the sediment surface and preventing the growth of other, desirable aquatic plant species. Water chestnut prevents nearly all water use where it occurs, creates breeding grounds for mosquitoes, and provides only marginal habitat for native fish and invertebrates”. (Naylor 2003).

Aim 3) **If the Chinese mitten crabs continue to burrow underneath the beds, then the seagrass will be reduced. “**The large crab is a burrowing species creating long burrows in soft river banks causing siltation of the waterways, bank erosion and increasing the risk of flooding. These habitat effects are likely to be apparent wherever the crab is well established” (Bentley 2011). It also seems that it is inevitable that many more places (mainly estuaries). Around the globe will eventually host the Chinese mitten crabs (Bentley 2011).

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