

The Necessity of Oysters in the Chesapeake Bay Estuary

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If someone who had no prior knowledge of oysters were to find one and pick it up, they might judge it based on its hard, rough, and drab exterior. They would have no idea about the treasures that live inside. While one's mind might go directly towards pearls, only one in about ten thousand oysters house a pearl. The real treasures inside an oyster shell have much larger benefits both to humans and the surrounding ecosystems. Oysters are crucial to global aquatic health because they filter and clean the water they live in, provide habitats, food, and jobs, and hold economic importance.

When I read the optional prompt for this contest, I immediately knew I had to write my essay on the importance of oysters in my community. I live in Virginia Beach, Virginia, a city that sits on the Chesapeake Bay and Lynnhaven River. I have been taught the major importance of these small creatures in our ecosystem throughout my entire life. My elementary and middle schools were both paired with the Brock Environmental Center, a center for environmental education programs created by the Chesapeake Bay Foundation, and we consistently helped them with oyster restoration and education projects. While many may not think of oyster conservation efforts, oysters are incredibly important to the ecosystem of Virginia Beach and many other coastal areas. I truly believe that the movement to protect current oyster habitats and create future ones is the most important environmental cause in my community.

Importance

Oysters are considered nature's filters because they are filter feeders - animals that feed by pumping water through their gills, trapping food, nutrients, suspended sediments, and other contaminants (Chesapeake Bay Program, 2023). In other words, as they eat, they help clean the water for underwater grasses and other aquatic organisms. One adult oyster can filter more than

50 gallons of water in a day (Lynnhaven River NOW, n.d. a). One major benefit of their filtration system is that they help remove the excess nitrogen from the water, often coming from fertilizers and septic systems. Nitrogen is essential for plants and animals, but too much of it increases the growth of algae, overwhelming bodies of water and reducing the levels of dissolved oxygen (Sargent, 2021). Interestingly, nitrogen doesn't harm oysters when they consume it. When they remove excess nitrogen, they incorporate it into their shells and tissues as they grow. Any leftover pollutants are formed into small packets and deposited on the sea bottom where they cannot cause any harm (Sargent, 2021).

Oysters also provide critical food and habitats for humans and other animals. As oysters grow, the larvae settle on top of other adults, forming nooks and crannies in between each oyster. These spaces provide shelter to hundreds of other species, from small fish to invertebrates (Chesapeake Bay Program, 2023). In the Chesapeake Bay ecosystem, oysters are consumed by many animals, including humans. Larvae is eaten by anemones, sea nettles and other filter feeders, flatworms and mud crabs feed on new spat, larvae that have attached to a surface, blue crabs and some fish feed on older spat and first-year oysters, and shorebirds feed on exposed adult oysters (Chesapeake Bay Program, 2023). Thus, removing oysters from the Chesapeake Bay ecosystem would not only have devastating impacts on the water quality, but also directly change the food chain of the Chesapeake Bay.

Dangers Oysters Face

Oysters are in danger. The population of Chesapeake Bay oysters used to be able to filter the entire bay in a week, but now it would take the surviving oysters more than a year (Sargent, 2021). There are many causes of their decline in numbers, including over-harvesting, disease, and population and habitat loss. When settlers came to America, they reported large oyster reefs

all down the bay's bottom. They began harvesting the oysters and dredging the bottom of the bay. In the 1850s, more than 1.5 million bushels of oysters were harvested from the Chesapeake Bay, and three decades later, this number is closer to 20 million (Chesapeake Bay Program, 2023). The bay's oyster fishery used to be one of the most lucrative in the country, but over-harvesting removed so many oysters that the reefs became destroyed. They had been scraped away by dredges, causing oyster beds to be reduced to thin, flat layers of dead shell. The decline in surface area of their habitat poses a danger to the species since what little space they have to live can be easily buried by sediment (Chesapeake Bay Program, 2023).

Oysters have been greatly impacted by disease. As the watershed's land has changed from forests to suburban and agricultural areas, there has been an increase in the amount of nutrients and sediment entering the water, resulting in poor water quality. Typically, oysters would be able to filter out the nitrogen and sediments, but the declining population has been unable to keep up. This has resulted in an increase in algae blooms, which has negatively affected the development of oyster larvae and sediment has suffocated them. Poor water quality has also raised oysters' stress levels, allowing them to be more susceptible to disease (Chesapeake Bay Program, 2023).

Effects of a Decline in Oyster Population on the Chesapeake Bay

Without oysters, the entire ecosystem would suffer. Bay grasses would struggle to survive without the water filtration allowing light to penetrate the water. Therefore, the species that use both bay grasses and oysters as habitats would not be able to seek refuge from predators and find prey to feed on, causing their populations to decline as well (Chesapeake Bay Foundation, 2023a). Without oysters, the entire ecosystem would be disrupted and species would die off. Humans would be affected by this change as well. The seafood industry would struggle, causing

a decline in the economy of Virginia Beach and other cities surrounded by the Chesapeake Bay (Chesapeake Bay Foundation, 2023a). Even though oysters might seem like small creatures with minimal impact on human life, their decline would not only affect aquatic ecosystems, but humans as well. Oysters need to be conserved.

Conservation Methods

In 2010, the Chesapeake Bay Foundation settled a lawsuit with the Environmental Protection Agency that included a Clean Water Act provision called the Chesapeake Bay Total Maximum Daily Load. This limits the amount of pollution entering the Bay in hopes of removing it from the federal "dirty waters" list. So, the Chesapeake Bay Clean Water Blueprint was created to nurse the bay back to full health (Chesapeake Bay Foundation, 2023b). Full implementation of this Blueprint is the primary way in which improved water quality and reduction of threats to oysters can occur by 2025. Following the provision does three things: 1) ensures everyone shares the responsibility for cleaning up the waterways, 2) sets two-year pollution-reduction goals to keep progress on track, and 3) imposes consequences for failure to make sure states and localities will meet their responsibilities (Chesapeake Bay Foundation, 2023b).

In 2014, Maryland and Virginia both committed to restoring their oyster population and habitats in eleven rivers by 2025. This deadline is approaching and we have made great progress. The areas where this restoration has taken place are beginning to see the benefit of increased oyster populations and a growing habitat (Chesapeake Bay Foundation, 2023a). Pollution, habitat loss, overharvesting, and disease are still issues that are limiting recovery, but as more and more oysters are being reintroduced into the Bay, these problems are lessening.

There are also ways for citizens to help. Through Lynnhaven River NOW's Save Our Shell Program, people can donate their shells after they eat their oysters. This program is paired with fourteen local restaurants and has four drop sites throughout the city in order to collect as many shells as possible (Lynnhaven River NOW, n.d. b). After a recycled shell is collected, it is taken to a storage site to cleanse them of harmful bacteria. Then, the shell is placed back into the water to build reefs in Virginia Beach's waterways. These reefs create habitats for hundreds of species, allow for the filtration and cleaning of surrounding water, and provide a new home for oyster larvae to attach and grow (Lynnhaven River NOW, n.d. b). This is an easy way for the community to become involved in the restoration process and have an impact on future oyster habitats since shell availability is one of the biggest limiting factors in oyster restoration (Chesapeake Bay Foundation, 2023a).

How I'm Going to Help

Throughout my life I have done many projects to help the oysters and the Chesapeake Bay ecosystem, and I plan to continue. The main thing I have done is creating oyster habitats to help rebuild what has been destroyed. I have worked with Lynnhaven River NOW to build habitats, plant aquatic grasses, and help clean up the pollution in our waterways. I also have donated all of my oyster shells so they can be made into habitats through their Save Oyster Shell Program. I plan to continue what I have been doing and reach out to other organizations like the Chesapeake Bay Foundation and Chesapeake Oyster Alliance to see what else I can do to help restore oyster habitats and rebuild the ecosystem. Lastly, I will educate others about the importance of protecting oysters since understanding is the first step. Conservation is so important and I want to be able to do everything that I can for my community.

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