

MATTAMUSKEET NATIONAL WILDLIFE REFUGE: THE THREATS THE LAKE AND THE SURROUNDING COMMUNITIES FACE

Background:

Located in Hyde County North Carolina, Mattamuskeet National Wildlife Refuge has a primary goal to protect and conserve wildlife and specifically migratory birds. The focal point of the refuge is Lake Mattamuskeet, a freshwater lake that is facing severe threats from land use, socio-economic activities, and sea level rise. These threats place a toll on water quality, freshwater wildlife, and local economy. Agricultural runoff has proved to be rich in phosphate and nitrogen that accumulates in the lake, preventing a stable water quality. This runoff forces algal blooms that can block sunlight from reaching the lake bed causing severe vegetation die offs. With sea level rising, local crop production could face an increased risk of salt intrusion from flooding and increased storms. Higher sea level will cause the tide gates along the canals from the Sound to the lake to remain closed, leaving limited draining options.

Futures:

Three scenarios were developed discussing how changes in pollution levels can affect the local economy. Increased or continued levels of pollution from agricultural runoff can lead to dead zones. With loss of biodiversity, revenue in relation to hunting, fishing, and wildlife observation will decline. Reducing the amount of nutrient input could allow for the system to gradually improve from current quality, giving aquatic vegetation the opportunity to live successfully allowing for economic profit. Stopping the nutrient input into the lake from farmlands allows the lake's quality to improve and assist in an increase of tourism, allowing for future investments of new tourism, furthering economic benefits. Three different scenarios have been conducted by the Union of Concerned Scientists in 2017 projecting the outcomes of the county due to sea level rise. These scenarios are based on the rate of carbon emissions globally. If carbon emissions drastically slow down, Hyde County is likely to see 2 feet (0.5 m) of sea level rise in the community by 2035, leaving as least 10% of the county flooded. If carbon emissions continue at the rate they are today, Hyde County is likely to see 4 feet (1.2 m) of sea level rise by 2030, leaving at least 20% of the county flooded and inevitable salt water intrusion on local farms and in Lake Mattamuskeet. If carbon emissions continue to increase Hyde County is facing up to 6.5 feet (2 m) in sea level rise, causing at least 40% of the county to be flooded, and likely causing the loss of most of the agricultural land and Lake Mattamuskeet due to salt water intrusion.

Solutions:

Options and recommendations to address the hazards in the near future include the restoration and re-opening of the Mattamuskeet Lodge, developing an agricultural management plan, and the opening of the gates that reach the surrounding canals. The opening of the Lodge can create revenue and programs for guests to become informed and involved with the lake. Developing an agricultural management plan can give local farmers an opportunity to learn how to practice alternative farming techniques and how these practices are beneficial to the lake. The final option discussed involves the opening the gates to gradually transition salt water into the ecosystem of the lake. Increasing salinity would not only help with the removal of excess nutrients, but also help local wildlife adapt to the salinity changes that could inevitably happen to the area. When developing successful restoration strategies, understanding the system of the lake and its' biological and economic value is critical.