

Cranberry Bog Restoration in Southeastern Massachusetts

By Mitch Hennings

Written for the ALPINE Summer Institute, 2022

Introduction:

A land conservation initiative that has interested me is the recently restored Tidmarsh Sanctuary in Plymouth, Massachusetts. Previously, the 481-acre property was a working cranberry farm that I spent most of my young life playing in and exploring. Now, after undergoing the largest fresh water ecological restoration to date in the northeast, the property has changed course into becoming a flourishing complex of environments that provide ecological services for the community both natural and human. Across the street, the Town of Plymouth purchased the Foothills Preserve, a 128-acre property, which is where the Beaver Dam headwaters collect most of the ground water and runoff from the local Pine Hills watershed. This water flows through Tidmarsh and finishes in Cape Cod Bay. The Beaver Dam headwaters now freely flows all the way to the ocean, unimpeded for the first time in over a century.

The property known today as the Tidmarsh Wildlife Sanctuary was originally a fully operational cranberry bog that served the Plymouth area, providing jobs and increasing the value of the local economy. To better understand how cranberries and their production play into the landscape and history of the region, we must understand the economic and social reliance that once was. In 1996, cranberry production in Massachusetts produced nearly \$117 million in product value. The state accounted for 35% of worldwide production, with nearly 5,500 jobs provided for local communities and \$2 million in payroll (Buzzardsbay.org). The local economy relied heavily on cranberry production for jobs, and the state relied on the revenue and taxes. Yet, at the end of the 1990's, the cost per barrel for cranberries crashed from a high of \$70 per barrel to just \$11.

Instead of selling the Tidmarsh property in 2010, the presiding landowners that managed the cranberry farm committed to restoration of the environment through a partnership led by The Massachusetts Department of Ecological Restoration and Mass Audubon, who currently manages and stewards the property. The property was recently awarded a \$30,000 grant (2021) from the Massachusetts Environmental Trust (MET) to focus on streamside vegetation restoration. The project has been funded through both private and state endowments that have led to a successful restoration that will continue to evolve for decades to come.

Tidmarsh is one of the most important large-scale landscape conservation projects that has been conducted in the northeastern region of the United States. This project has added immense social and ecological values to the local ecosystem, providing everything from ecosystem services, recreation, landscape health, and climate resilience. As time goes on and climate change begins to rear its ugly head further, projects like these where entire landscapes are allowed to heal and become connected once more will become ever more important.

Past:

The history of the cranberry is ingrained in the culture of Southeastern Massachusetts, supporting the people of the region with an industry that would provide for them for nearly 200 years. The first documented controlled cultivation of the cranberry we see today occurred in 1816 by Henry Hall of Dennis (Albanese 2016). Just 40 years later Barnstable County had a total of 197 acres of managed cranberry bogs, and just a decade later Harwich, a town within Barnstable County, jumped from 17 to 209 acres, becoming an industry leader (Albanese 2016). The growth that this industry realized during the late 19th and early 20th century proved to alter the landscape for decades to come. Peat bogs and wetlands throughout the state have been changed and manipulated to provide the perfect growing conditions for the globally sought-after fruit. The changed hydrology of flow through rivers, creation of retention ponds, and draining of nearby water bodies for flooding during harvest and crop management has proved destructive to the environment (Buzzardsbay.org 2022). The Massachusetts landscape and her resources have been subjected to the production of this crop for better or for worse.

The previous population dynamics of the Commonwealth during the golden age of cranberry agriculture was suitable for the intense resource consumption required of cranberry production. Yet today, Massachusetts and the south shore region have experienced exponential growth in both population and density (Worldpopulationdynamics.com 2022). This novel increase in population has put a constraint on cranberry production as a struggle for resources has occurred in lieu of increased droughts, destructive weather events, and rising sea levels. Resource disputes, as well as a product market that is no longer cornered by Massachusetts, has faced competition from all over the world in Chile, Canada, Baltic states and within the U.S. In 1999, cranberry prices dropped to \$11 dollars per barrel, which is considerably below the breakeven price of \$35 dollars per barrel. Since the price has not recovered from its high of \$70 dollars in the mid-nineties, production has been spread throughout the country with the top producers being Wisconsin, Massachusetts, New Jersey, and Oregon (Statista.org 2022).

Present:

Amongst failing economic conditions surrounding cranberries and their production, there may prove to be a positive solution for both the farmer and the environment. These conditions are forcing farmers to either modernize their infrastructure, plant hybrid cultivars, or exit the industry completely (Hoekstra et al. 2019). Farmers passionate about conserving and restoring their property and retired farmland are supported by the state through the Department of Ecological Restoration (DER). The DER has created a program that locates property of priority, which is determined through several factors. Some of these factors include public access, high potential for wetland restoration success, inclusion of other partners, and connection to other protected land (Mass.gov 2022). The potential properties must also have the required environmental factors which are flow-through bogs, fields underlain by deep peat, and low-lying property subject to coastal or inland flooding (Mass.gov 2022).

A study has shown that the highest yielding cranberry farms were found in newly renovated farmland which did not have riparian characteristics, and those farms found to be in riparian wetland environments were the lowest yielding farms (Hoekstra et al. 2019). Considering the lack of investment in riparian wetlands, they have a high likelihood of retirement which provides

an opportunity for restoration. An estimated 1,000 hectares of high priority farms statewide can be described as stream adjacent farmland, which are prime for restoration as well as providing struggling farmers with a profitable exit strategy (Hoekstra et al. 2019).

A real-world example of this kind of exit strategy and collaborative effort to conserve and restore a retired flow through farm is the Tidmarsh Wildlife Sanctuary, currently owned and managed by Mass Audubon. In 2010, the property was sold by the owners and lifelong farmers, Evan Schulman and Glorianna Davenport. Instead of selling for profit and development, they decided to commit their environmentally significant land to restoration and protection for decades to come. Part of the restoration was to create a connective cold-water stream that flows freely from the headwaters of Beaver Dam Brook all the way to the ocean (Massaudubon.org 2022). This stream provides a path for migrating river herring, brook trout, and American eel.

Tidmarsh is the largest and most ambitious fresh-water marsh restoration in the northeast, aiming to create a productive mosaic of habitats including ponds, cold water streams, red-maple and Atlantic cedar swamps, grasslands, and pine-oak forests (Massaudubon.org 2022). It has set an example for large landscape restoration, bringing 481-acres of riparian wetlands back to their original form nearly 200 years after their alteration for agriculture. Considering the potential for large landscape restoration in Southeastern Massachusetts, the future is bright for creating a resilient environment. Climate change threatens all coastal communities, including the Wareham and Cape Cod area (coast.noaa.org 2022).

Yet, one of the best things a community can do to mitigate the effects of sea level rise (SLR) and other climate change threats is by building ecosystems that can dampen the impact of these inevitable situations. Tidmarsh serves the community in many ways with its ecosystem services, but one of the most crucial will be its ability to allow salt marshes a place to creep and migrate too. Salt marshes are regularly flooded intertidal habitats that provide many ecological functions; these systems and their values are well established and recognized as crucial motivation for coastal management (Vincent et al. 2019). Until recently, salt marshes have been considered resilient to changes in sea-level rise due to their natural adjustments through sediment accretion and lateral vegetation growth (Vincent et al. 2019). Traditionally, marshes would migrate landward as needed, but due to increased development and future displacement of coastal communities this natural process is under threat (Vincent et al. 2019, coast.noaa.org 2022). One way to sustain this process would be to create buffers or preserve transgression zones that would allow these ecosystems to climb landward. If these transgression zones are not preserved and restored, estimated salt marsh loss due to the speed at which SLR will occur is estimated anywhere between 20-45% of global salt marsh loss (Vincent et al. 2019). It is uncertain and currently non-quantifiable, but the impact of sea level rise with the buffer of salt marshes will provide enormous benefit for local communities.

Future:

Forecasting the future of how SLR and climate change will impact different regions of the world and local communities is difficult. Yet, conserving and preserving land that has been deemed ecologically important is a crucial method in preparing for climate change. As described by Vincent et al. in their paper, the efforts made by the DER and a handful of local land trusts

restoring retired farmland and cranberry bogs may be one of the best options moving forward regarding mitigating SLR and helping communities. The history of cranberry bogs and their stamp on the culture of Southeastern Massachusetts has without question supported the economy and its people for hundreds of years. Now the bogs left behind will provide support for the region once more as we move forward protecting our coastline. Struggling farmers will now be supported financially by the state which will provide relief while also setting up the proper transgression zones for salt marsh movement.

Tidmarsh is a shining example of both the responsibility that farmers have, and the impact they can make, by deciding that the crucial land they own should be preserved and restored for the benefit of generations to come. Considering the major success achieved with Tidmarsh, bog conservation with riparian restoration in mind should be the focus moving forward. Large landscape restoration is achievable with community and state cooperation, because without everyone pulling in the same direction little would be possible.

A Note from Wildlands Trust:

Wildlands Trust is a key conservation partner for Southeastern Massachusetts communities. Wildlands assists towns, landowners, and farmers in their conservation efforts through a wide variety of means including in-fee land conservation, conservation restrictions, and agricultural preservation restrictions. Please contact us to start a conversation about the future of your land! Scott MacFaden, Director of Land Protection: smacfeden@wildlandstrust.org.