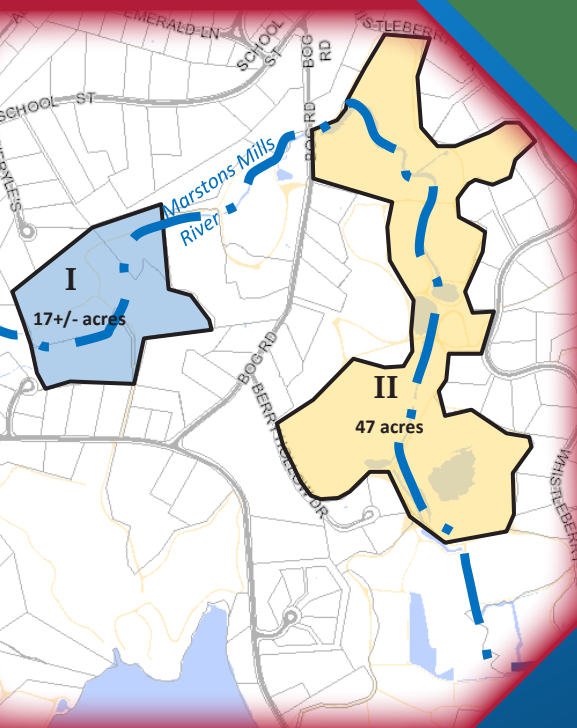




# COALITION Quarterly



New Regulations ✓



Bogs Acquired ✓



Restoration  
*Coming Soon*

From  
Pollution *to* Solution

[BCleanWater.org](http://BCleanWater.org)

# A Note From The Helm

Progress!!

After six years of hard work, I can finally report that we have meaningful, positive news on two fronts.

Recall that our efforts have targeted clean water solutions with a two-pronged approach.

First, attack water pollution at the source, our individual households, which contribute to approximately 85% of our water problems via inadequate septic systems and cesspools.

On July 7th, the Massachusetts Department of Environmental Protection instituted new wastewater regulations for large areas of the Cape and Islands that have been deemed Nitrogen Sensitive Areas (NSAs). Over the next several years, municipalities will have to apply for watershed permits that ensure a 70% reduction in nitrogen load occurs in the affected NSAs within 20 years.

In that regard, our Shubael Pond Project continues to deliver spectacular results with the innovative and alternative (I/A) wastewater treatment systems we have been trialing, delivering median nitrogen removals of 96%! Almost 100 of these I/A systems have now been installed across the Cape and on Martha's Vineyard. We believe that these new systems, alongside municipal sewer expansion, will finally offer a realistic and affordable pathway to wastewater clean-up at the source!

Secondly, target the Cape's polluted groundwater by developing and deploying "nature-based" water purification approaches.

The last 50 plus years of residential development have occurred largely on the back of technology the experts told us not to use here. Cesspools and Title 5 septic systems do little to remove nitrogen. Our slow-moving groundwater is now loaded with contamination that will continue to flow toward our lakes, ponds, and estuaries for decades to come - even after municipal sewer expansion and new individual wastewater treatment system installations are deployed.



This brings me to the second piece of good news. Our work with scientists at the U.S. Environmental Protection Agency and the U.S. Geological Survey indicates that returning cranberry bogs to their natural wetland state may enable significant nitrogen reductions in ground and surface waters in specific watersheds. Plants and natural biological activity can intercept these polluted waters and consume large amounts of excess nitrogen before it enters, and harms, threatened waterbodies.

One such threatened watershed is Three Bays in Barnstable. I am excited to report that we have received a \$1.27 million grant from the State, which has allowed us to purchase and protect almost 64 acres of bogs and associated upland in Marstons Mills. Working with the Commonwealth's Executive Office of Energy and Environmental Affairs, The Compact of Cape Cod Conservation Trusts, Barnstable Land Trust and other partners, we have taken this critical first step. We intend to raise more funds to purchase and protect more land, and to allow the restoration work to reach fruition.

I often say that this ecological restoration project is the one approach that can positively change the quality of the receiving waters in my lifetime (and probably yours). Why is that? It is because these surface waters carry more than 30% of the polluted water to the estuary in just hours. We may be able to turn off that spigot in just a few years!

We hope you will help!!

# Finding Inspiration at the Tidmarsh Farms Wetland Restoration Project

Although July 28th was one of the hottest days of the year, BCWC staff enjoyed a very cool experience walking and exploring areas within the 200 acres of Tidmarsh Farms in Plymouth.

Tidmarsh Farms Wetland Restoration Project began in 2010 and is the largest freshwater wetlands restoration project in Massachusetts. Actively restored from 2015-2016, and now part of Mass Audubon Tidmarsh Wildlife Sanctuary, this was the second wetland restoration of a cranberry farm in the state. It was followed in 2020 by the restoration of Foothills Preserve and Manomet Brook, which were also portions of the Tidmarsh Farms property. In all, the land protection vision initiated by Tidmarsh Farms beginning in 2008 resulted in the conservation of 610 acres of former cranberry bogs in Plymouth.

Co-hosted by Mass Audubon and Living Observatory, the goal of the walk was to survey several areas of the restoration and to collect insights that can be applied to other ecological restoration projects. As we blazed our own paths through tall grasses and swampy land, we used all our senses as we examined plants, soil types, organisms, and water.

As BCWC begins the restoration of approximately 64 acres of cranberry bogs surrounding the Marstons Mills River, there was one main take away that really stood out on our walk. Almost 100% of the plants that are now flourishing in Tidmarsh are from the original seedlings from hundreds of years ago before the land was farmed for cranberries. Jurassic Park! We are hoping the same will happen with our restoration project. Stay tuned!

To learn more about the Tidmarsh Farms Wetland Restoration Project, please visit [livingobservatory.org](https://livingobservatory.org) and [livingobservatory.org/learning-report](https://livingobservatory.org/learning-report).



**Above:** BCWC staff joined more than 60 environmentalists, scientists, and students on a walk through Tidmarsh Farms.



**Left:** Alex Hackman, Director of Ecological Restoration for Mass Audubon, who has been part of the Tidmarsh restoration since it began, talks to participants about their observations.



What was once a system of active cranberry bogs is now a beautiful landscape featuring thousands of native plant species, including Atlantic white cedar seedlings (foreground on the right).

# Notes From the Field — Summer 2023

## Indian Ponds Invasive Aquatics Surveys

BCWC interns were out on the waters of Middle Pond and Mystic Lake in Marstons Mills as part of a collaboration with the Indian Ponds Association (IPA). The interns conducted surveys for the presence of the invasive aquatic plant *Hydrilla verticillata* using methods including rake tosses, an underwater camera, and snorkeling. Along with *Hydrilla*, we also found a mystery blob that resembles a brain, which was later identified as a magnificent bryozoan, *Pectinatella magnifica*. This bryozoan is actually a colony of microscopic organisms. Don't worry, they are completely harmless filter feeders that improve water quality and can be indicators of a healthy ecosystem. The interns also surveyed the perimeters of the ponds for invasive gray willows, *Salix cinerea*. BCWC would like to thank the IPA for generously providing funding for this study through their Anderson Intern Partnership Award.



*The prolific and invasive Hydrilla, also called water thyme, in Middle Pond.*



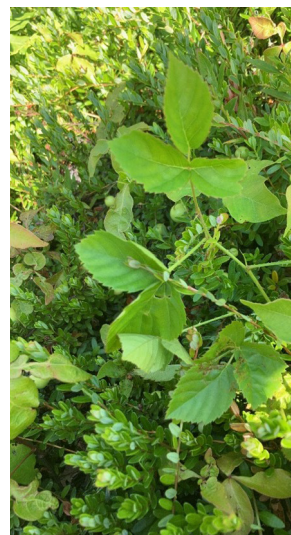
*Pectinatella, an unexpected find during the surveys.*

## Cranberry Bog Vegetation Surveys

Vegetation surveys were conducted by BCWC interns at 10 locations throughout our recently acquired cranberry bogs. Randomly selected 5' x 5' plots, called quadrats, were set up where interns identified plant species and estimated species coverage within them. These quadrat surveys will help BCWC track changes to the bog's plant communities before and after our Marstons Mills Cranberry Bog Restoration Project. Common plants identified by the interns included swamp dewberry, poison ivy, red maple, and, of course, cranberries. We hope to see an increase in biodiversity and less invasive species like gray willow and multiflora rose after the restoration.



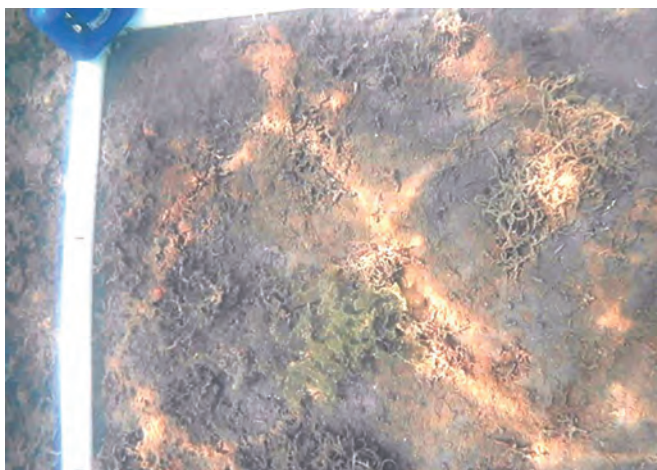
*Above: BCWC interns set up one of ten quadrats for plant surveys in our bogs.*



*Left: Swamp Dewberry, *Rubus hispida*, was one of the more prevalent plants found during the quadrat surveys.*

### Three Bays Benthic Surveys

BCWC conducted benthic surveys of the Three Bays estuary this summer. Using underwater imagery, we hope to track changes over time to the benthic (bottom) conditions in Cotuit, North and West Bays. In addition, we are looking at the visual impacts of eutrophication (nutrient overload in water that can lead to an increase in algae and plant growth) on benthic communities in the bays. The first image of North Bay, which is heavily affected by eutrophication, shows decomposing algae mats overlaying a muddy substrate. The next image of Nantucket Sound shows less impact from eutrophication with a sandy substrate consisting of eelgrass beds.



*North Bay substrate*



*Nantucket Sound substrate*

### Warming Waters, Cool New Visitors, More Problems

With increasing warm waters in our oceans come many changes and unexpected sights. Each summer, the Gulf Stream transports tropical and subtropical marine species to southeastern Massachusetts. However, seeing an Atlantic flyingfish (*Cheilopogon melanurus*) in West Bay on July 24th was definitely unexpected! As global waters continue to warm, we can expect to see many more aberrations and changes. Along with new species, warmer water has the added negative effect of holding less dissolved oxygen. Oxygen molecules in hot water can more easily overcome the weak binding forces within water and escape through the surface. This will negatively impact all marine and aquatic organisms living in the area and make a bad problem even worse. This summer we have seen water temperatures approaching 81 degrees Fahrenheit and dissolved oxygen readings as low as 0.23 mg/L (for reference 5.0 mg/L is considered relatively low).



*Photo Credit NatureRules 1*

*The flyingfish's large pectoral fins act like wings when they jump out of the water.*

# Summer Intern Highlights

*We thank our outstanding crew of interns, who worked with BCWC throughout the summer on a variety of projects, for their dedication, enthusiasm, and passion. Goodbye and good luck with your next venture!*



## **Owen Ball**

Owen is a sophomore studying chemistry at the University of Massachusetts Amherst.

## **J.D. DiCarlo**

J.D. is a junior at Dickinson College studying environmental science and biology with a particular passion for plant ecology.

## **Grace Hilton**

Grace is a sophomore at the College of William and Mary, where she is pursuing a major in applied mathematics and a minor in environmental science.

## **Samantha Jensen**

Samantha is a senior at Tufts University studying geoscience and environmental science with a minor in urban studies.





**Grace Magnacca**

Grace is a junior at the University of Tampa studying environmental studies with a minor in sustainability.

**Haley O'Neil**

Haley graduated this past spring from Unity Environmental University with a Bachelor of Science in marine biology and sustainable aquaculture.

**Tim Pesek**

Tim, a recent graduate of Connecticut College where he majored in environmental studies and minored in geoscience, is back for his second summer interning with BCWC.

**Bella Southwood**

Bella is a senior at the University of Rhode Island studying marine biology.

**Nicholas Soukas**

A student at Brookline High School, Nicholas assisted the interns at the oyster upweller and with marine invasive species monitoring.





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*Barnstable Clean Water Coalition works to restore and preserve clean water in Barnstable. BCWC utilizes science as its foundation to educate, monitor, mitigate and advocate for clean water.*

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**BCWC's Native New England Demonstration Gardens**



BCWC's Native New England Demonstration Gardens were well tended to this growing season by a group of enthusiastic volunteers from the Osterville Garden Club with guidance from BCWC Board Member Jack Ahern, who designed the gardens. Thanks to their hard work, our gardens flourished and attracted birds, insects, and lots of interested people.

*Above left photo, pictured left to right: Jack Ahern, Jane McLaughlin, Carol Zais, Cate Gulliver, and Peggy Anschutz.*



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