



# Friends of Mashpee National Wildlife Refuge

## Winter Newsletter 2023

### ***Why Eelgrass Matters***



Eelgrass meadows (*Zostera marina*) are one of the most important ecological habitats in oceans for the endless functions and services they provide for many species. Eelgrass is a flowering, underwater seagrass plant that is commonly found in estuaries and shallow bays with temperate temperatures, like we have here on Cape Cod. Optimal growing

temperatures are between 50° F to 68° F, occurring mostly in spring and fall. Higher water temperatures can slow or stop growth and may even increase mortality, a concerning fact given that Waquoit Bay Reserve scientists have documented a 6 degree increase in Waquoit Bay water temperatures during the fall over a twenty-year period. The importance of eelgrass can be seen across many species including food for sea turtles and ducks, shelter for



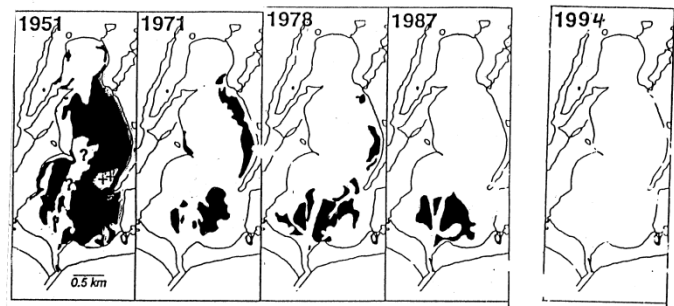
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young fish, and spawning areas for invertebrates, shellfish, and many types of finfish. Not only does eelgrass provide benefits for these species, but it can also aid humans through ecological services like storing carbon and acting as a buffer, protecting coastal lands and reducing erosion. Underwater eelgrass meadows function by trapping

sediment which can stabilize the substrate and reduce the energy force from waves on coastal land forms. Additional benefits include the ability of eelgrass to produce food and release oxygen into the water. Eelgrass meadows also help to filter runoff and excess nutrients flowing from the land into our coastal waters.

On Cape Cod, eelgrass beds have almost completely disappeared largely due to human activity. Cape Cod is made up of sandy soils which allow pollutants such as nitrogen and fertilizer to filter through our groundwater and make their way into coastal waters where eelgrass beds tend to grow. This process is known as eutrophication or nutrient loading.

These added nutrients come mainly from our septic systems, but also from fertilizers we use on our properties and from atmospheric deposition from burning fossil fuels. The consequences of this process of over feeding of nutrients into coastal waters leads to frequent algae blooms that can outcompete and shade eelgrass from the



Changes in eelgrass distribution in Waquoit Bay, MA.

Eelgrass Distribution in Waquoit Bay (personal communication, R.Crawford)

J. E. Costa, et al. 1992.



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sunlight needed to grow. Instead, we see an overgrowth of seaweed that reduces the ability of eelgrass to survive overall and results in large deposits of rotting algae on beaches and a thick, mucky layer of decomposing organic matter on the bottom of our bays and estuaries. Human activity such as construction, motorboating, and harvesting shellfish have also physically disturbed the way eelgrass can grow. Besides ripping out individual plants, these activities can cloud the water with sediment and block sunlight from reaching the eelgrass below the surface.

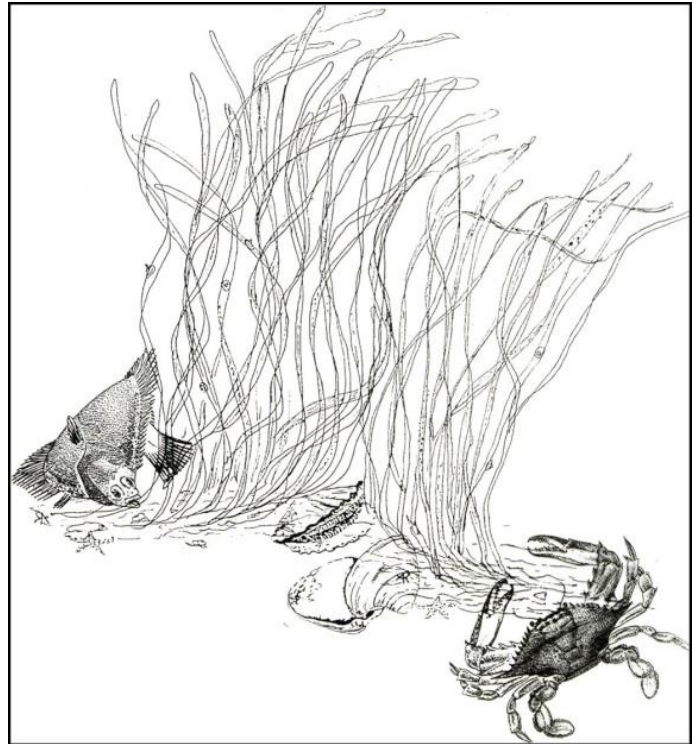
There is some hope that eelgrass can make a comeback on Cape Cod if human activity is managed and funding is established to protect and reestablish the seagrass. Research into restoring eelgrass has shown promise in some areas. In the 1930s, a wasting disease destroyed eelgrass beds along much of the east coast including Cape Cod. On Virginia's Eastern shore, a hurricane added to the destruction and the plants couldn't regrow or seed due to the turbidity (lack of clarity) in the water. Both the geology and hydrodynamics of the system were altered, creating an unsuitable environment. In Virginia, a major effort using over 500 volunteers over the past 10 years to harvest seeds from plants in the York River and disperse them in Virginia Seaside Bay have paid off (DEQ Virginia 2022).



Virginia Coastal Zone Management (CZM) began analyzing the water quality in the York

River to harvest seeds and plant them in Seaside Bay and found it was suitable for efficient growth because pollutants were low. From 1999 to Present, CZM has been able to restore 9 acres of eelgrass beds along with the reintroduction of bay scallops.

Boston Harbor also had a successful eelgrass restoration project. This was possible because water quality was improved through the installation of the Deer Island Wastewater Treatment Facility and the extension of the outfall pipe from 1991 to 2000 (Leschen et. al 2010). Planning efforts included locating areas in Boston Harbor that would best support eelgrass with the right environment and factors such as depth, exposure to northeast winter storm winds, past and present eelgrass distribution, water quality and sediment type using USGS seafloor maps. Boston's wastewater problem was addressed with a state of the art, tertiary treatment facility and by moving the outfall pipe nine miles out from Boston Harbor into Massachusetts Bay. The resulting improved water quality in the harbor allowed scientists to restore over 2 hectares (approximately 5 acres) of eelgrass beds. The Center for Coastal Studies in Provincetown continues to monitor Cape Cod Bay for impacts from the outfall discharge.



Line drawing by former WBNERR volunteer Caroline Goldstein

On Cape Cod, it is difficult to establish the same type of restoration project with success because of on-going issues with our water quality, due to high levels of nutrients, mainly nitrogen, in our wastewater. A study done by The Nature Conservancy and Cape Cod Cooperative Extension Marine Program put this to test in 2010-2011 by transplanting eelgrass to several different sites. The project employed both a clump transplant method and the horizontal rhizome method in Phinney's Harbor in Bourne, Nauset Inlet in Orleans, and Cape Cod Bay in Truro. Success was limited and ultimately eelgrass survival was almost zero in all three areas for varied reasons including excessive bioturbation, sediment instability, low light availability and marginal water quality.

With the recent release of new wastewater regulations from Mass DEP, we all have an opportunity to help address our problems and restore the environment, benefiting not only eelgrass, but the abundance of species reliant on the habitat it creates. The science has been done; we know the problem and have identified a number of solutions. The time is right to get involved and support your communities' efforts to manage our wastewater. Our future here depends upon it!

# *Creature Feature*

## *New England Cottontail Rabbit*

The New England Cottontail is our only native rabbit in an area stretching from Maine to east of the Hudson River in New York. Commonly mistaken for the Eastern Cottontail, they are habitat specialists! They thrive in early successional forest with thick

understory with tangled vegetation such as brushland, along with open grassy areas and low plants. A young forest provides key resources needed for the cottontail since they need bark, twigs, leaves, buds, shoots, flowers, and fruits. During the summer they feast on fruits and plants while in the winter they eat woody vegetation. This helps the New England Cottontail survive year-round with plenty of cover and food.

The New England Cottontail is also protected under the Endangered Species Act, which establishes federal protection for this endangered animal for conservation. Because of the decrease of habitat and increased human development, the future of the New England Cottontail is critical to address in its native home. It is estimated that only 13,000 New England Cottontails are left. It is important to manage their habitats and protect them because they have a short life span that makes them more vulnerable to not only humans but to their top predators, which include owls, hawks, coyotes, bobcats, and many larger mammals and birds. On average, the lifespan of these rabbits is between 15 months to



Photo by Kristine Beebe

2 years. With such a short lifespan, successful breeding is critical, occurring from late March into August and September. During breeding season, a healthy female is able to produce several litters. A female cottontail may initially face off in a threat posture when encountering a male rabbit, then proceed with the pair jumping over each other or one rabbit jumping while the other runs beneath it. A mother cottontail will build a nest by digging a depression into the ground of a dense vegetation forest floor. They use their fur, twigs and leaves to bed their nest, and all this occurs during the night which is really cool! Mother cottontails spend roughly four weeks in their gestation period, and eventually give birth in their nest to a litter size of up to 5 or 6. After feeding and nursing for 2 weeks, the young rabbits are ready to be out on their own in a very short period of time.



Photo by Kourtne Bouley



Photo by Kerry Reid

*Articles for this newsletter were researched and written by:*

### ***Leonel “Leo” Lainez***

Hola! My name is Leo, and I am servicing with AmeriCorps Cape Cod 2022. I am from Brockton, MA and recently graduated as a First-Gen Latinx at the University of Massachusetts- Amherst in Natural Resources Conservation. My four-focus area throughout the year will specialize in environmental conservation, natural resource management, disaster preparedness, and community/volunteer engagement. This year my individual placements are with Waquoit Bay National Estuarine Research Reserve, the Friends of Mashpee National Wildlife Refuge and Mashpee Department of Natural Resources focusing on shell fishing. All three individual placements give me great hands-on experience on the field, doing research and educating the public about my efforts in the environment.

***Thank you, Leo!***

***Please check our website for upcoming events, activities and volunteer opportunities like work days in our pollinator gardens, and stay tuned for updates on “Season Two” of our Live Osprey Cam!***

***Also, check out the Town of Mashpee Interpretive Nature Tours on Saturday mornings to explore the beautiful conservation lands!***

## ***2023 Friends of Mashpee NWR Board of Directors***

Glenn Davis, President

MaryKay Fox, Treasurer

Lucinda Keith, Clerk

Thomas Fudala, Historian

Nancy Church

Katelyn Cadoret

Joan and Neil Barkin, Membership Committee



# Membership Form

YES! I want to support the *Mashpee National Wildlife Refuge* - enclosed are my dues as checked below.

Name: \_\_\_\_\_  
Phone: (H) \_\_\_\_\_ (C) \_\_\_\_\_  
Street: \_\_\_\_\_  
Town: \_\_\_\_\_ State: \_\_\_\_\_ ZIP Code: \_\_\_\_\_  
Email: \_\_\_\_\_  
Date: \_\_\_\_\_

Enclose payment for the membership - please make checks payable to: **FMNWR**  
Mail to: **FMNWR, P.O. Box 1283, Mashpee, MA 02649**

## Thank you!

- |   |  |
|---|--|
| <input type="checkbox"/> Junior (18 and under) - \$10 | <input type="checkbox"/> Refuge Sponsor - \$500    |
| <input type="checkbox"/> Individual - \$25            | <input type="checkbox"/> Lifetime Gift - \$1000    |
| <input type="checkbox"/> Family - \$50                | <input type="checkbox"/> Corporate Gift - \$ _____ |
| <input type="checkbox"/> Conservation Friend - \$100  | <input type="checkbox"/> Other - \$ _____          |
| <input type="checkbox"/> Wildlife Sponsor - \$200     |  |
- 

# Volunteer Form

I would be interested in the following opportunities listed below:

- Webpage and Social Media
  - Fundraising and Events
  - Stewardship Projects
  - Newsletter
  - Native Pollinator Gardens
  - Education Talks/Walks, Events at Schools
  - Other \_\_\_\_\_
- 

***The Friends meet monthly on the first Tuesday at 5pm on Zoom.  
Please, come join us and get involved with Refuge projects,  
Friends group, pollinators, and community events!***