



## A Plan to Protect Fishers Island's Seagrass

August 6, 2022



August 2022

Dear community member,

The Fishers Island Seagrass Management (FISM) coalition formed in the summer of 2017 at the urging of the then Director of the Long Island Sound Program of The Nature Conservancy, who saw both a need and an opportunity. The need is to protect the threatened but vital resource of eelgrass beds in Long Island Sound. The opportunity is both the existence of relatively healthy eelgrass beds in the nearshore waters of Fishers Island and a local community that had demonstrated both a strong environmental ethic and a determination for self-governance. As such, a group of us came together to protect our eelgrass beds to ensure the future quality of life and character of Fishers Island that we all know and love.

The group was formed to represent a broad array of stakeholders – those that in one way or another interacted with the eelgrass meadows. The participating stakeholders are Henry L. Ferguson Museum, Fishers Island Conservancy, ICB, DCO, Clubs (Hay Harbor, Fishers Island Club), Harbor Committee, Fishers Island School, marine resource-dependent businesses (commercial fishing, aquaculture), non-resource dependent businesses (Pirates Cove, contracted ferries, FI Ferry District, landscapers), and recreational users (divers, boating/FI Yacht Club, spearfishing, fishing).

The FISM Coalition initially spent time self-organizing, creating processes to structure how we would work together and our collective goals, as well as educating ourselves and joint fact-finding as a group. In the first few years, we invited several speakers, ranging in expertise from water quality to coastal construction to the New York Seagrass Protection Act, as well as representatives from other communities who were working on their own seagrass management plans.

With the knowledge and information gained, we then embarked on a process to develop a plan to guide community actions to protect our eelgrass meadows. Admittedly, the process was long and somewhat convoluted. There were differences of opinion, perhaps most notably around how much regulation may be needed to achieve our goals. The current resulting plan, which we present here, does not rely on any government regulation, however, that means that the broader community will need to embrace the recommendations that we as a representative collation are putting forth here if we are to achieve the goals. We believe that with appropriate community awareness, we can work together to implement the necessary steps to ensure that future generations of Fishers Island will ensure the same benefits provided by the eelgrass that we enjoy today.

Our work is not done; the FISM coalition will continue to meet to oversee the implementation of our recommendations presented here, as well as to work on research and monitoring to gain more explicit and local knowledge of the eelgrass and its status. This plan represents the first step in our journey together, one that we invite you to take with us.

We would like to acknowledge the work and dedication of the people who made this plan possible: Meg Atkin, Beth Arsenault, Donnie Beck, Marj Beck, David Beckwith, Christian Fox, Emily Bodell, Tracy Brock, David Burnham, Heather Burnham, Chantal Collier, Geb Cook, Chip DuPont, Andrew Edwards, Chris Edwards, Louisa Evans, Chris Finan, Christian Fox, Carol Giles, Andrew Gerbutavich, Stephanie Hall, Connor Jones, Justine Kibbe, Steve Malinowski, John McCall, Elizabeth McCance, Ted McGraw, Adam Murray, Jessica NeJame, Diana Nguyen, Pierce Rafferty, Ted Rogers, Mark Terry, Sally Wakeman, PB Weymouth, Lincoln White, Candance Whitman, and Joe Woolston.

Please join us in our efforts to save our seagrass!

The FISM Coalition

## What is seagrass?

Seagrasses are aquatic plants that provide multiple benefits for nature and people. Like their terrestrial cousins, seagrasses have roots, stems, leaves, and flowers. While often confused with seaweeds, seagrasses are not at all related, with completely different structures and parts.

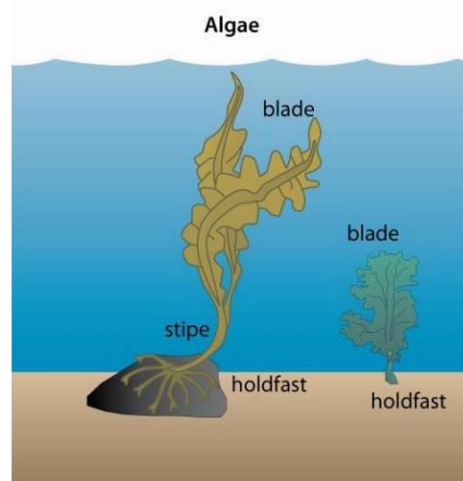
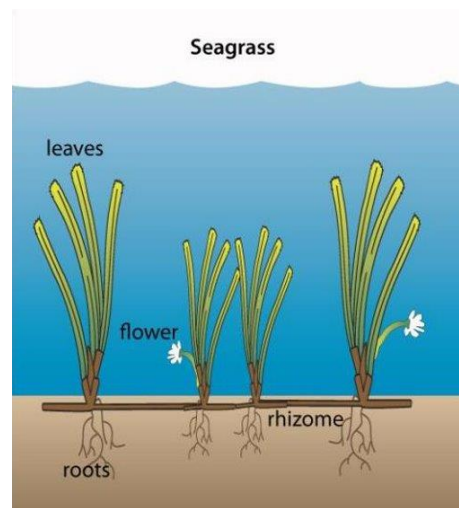
In Long Island Sound, we have two species of seagrass – eelgrass (*Zostera marina*) and the much less common widgeon grass (*Ruppia maritima*). While widgeon grass is only found at shallower depths, eelgrass can grow at depths of up to 24 feet.

Healthy eelgrass grows closely together forming meadows, which in turn are a vital habitat for wildlife in Long Island Sound and coastal areas worldwide. The Sound's eelgrass meadows serve as essential spawning, nursery, shelter, and foraging areas for sea turtles, pinnipeds, shellfish, crustaceans, and fish, including many commercially and recreationally important species, such as bay scallops (*Argopecten irradians*), American lobster (*Homarus americanus*), tautog (*Tautoga onitis*), striped bass (*Monroe saxatilis*) and summer flounder (*Paralichthys dentatus*) (11). Together the species form an important ecosystem.

Eelgrass meadows are a recognized habitat type much like a coral reef or a tropical rain forest. In the United States, seagrass meadows are federally listed as Essential Fish Habitat by the National Oceanic and Atmospheric Administration, a designation shared by wetlands and coral reefs, among others (16). Because of their great ecological importance and vulnerability to degradation from human activities, seagrass meadows are further designated as Habitat Areas of Particular

Concern, a designation set by regional fishery management councils.

The Sound's submerged aquatic vegetation beds are recognized as one of the twelve coastal and marine habitats prioritized for preservation and restoration in the 2015 Long Island Sound Study Comprehensive Conservation & Management Plan (12). The New York Ocean Action Plan also calls for the development and implementation of seagrass management plans for designated seagrass management areas (13).



## Why is it important?

### Seagrass is a wildlife habitat



Striped bass, tautog, bluefish, green sea turtles, lined seahorses, and many other species depend on eelgrass meadows for food, shelter, and nursery areas. In addition to the commonly recognized species, eelgrass meadows sustain millions of small invertebrates (11).

### Seagrass fights climate change



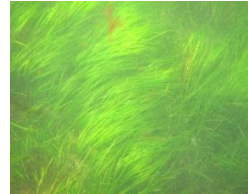
Seagrass meadows mitigate climate change by both sequestering and storing carbon. Seagrasses absorb twice as much carbon per area as tropical forests on land (11).

### Seagrass improves water quality



Seagrasses improve water quality by producing oxygen and extracting excess nitrogen. Seagrasses filter out pathogens, ridding the water of disease agents, which reduces food contamination. They also help settle out sediments, thereby improving water clarity (12).

### Seagrass protects coastlines



Seagrasses protect coastlines by dampening energy and trapping sediments. These actions stabilize shorelines and prevent coastal erosion (12). In this capacity, seagrass meadows serve as natural buffers, reducing the need for hardened shorelines.

### Seagrass supports fishing



Seagrass is a critical nursery habitat for juvenile fish for both recreational and commercial fisheries. One acre of seagrass can contain 40,000 finfish (2). About 20% of the world's biggest fisheries, including Atlantic cod and walleye pollock, rely on seagrass (7,22).

### Seagrass protects shellfish



Eelgrass beds are an important habitat for scallops, clams, and other shellfish. Seagrass may help shell-forming animals overcome the effects of ocean acidification, by buffering the surrounding seawater (21).

## What is the status of eelgrass?

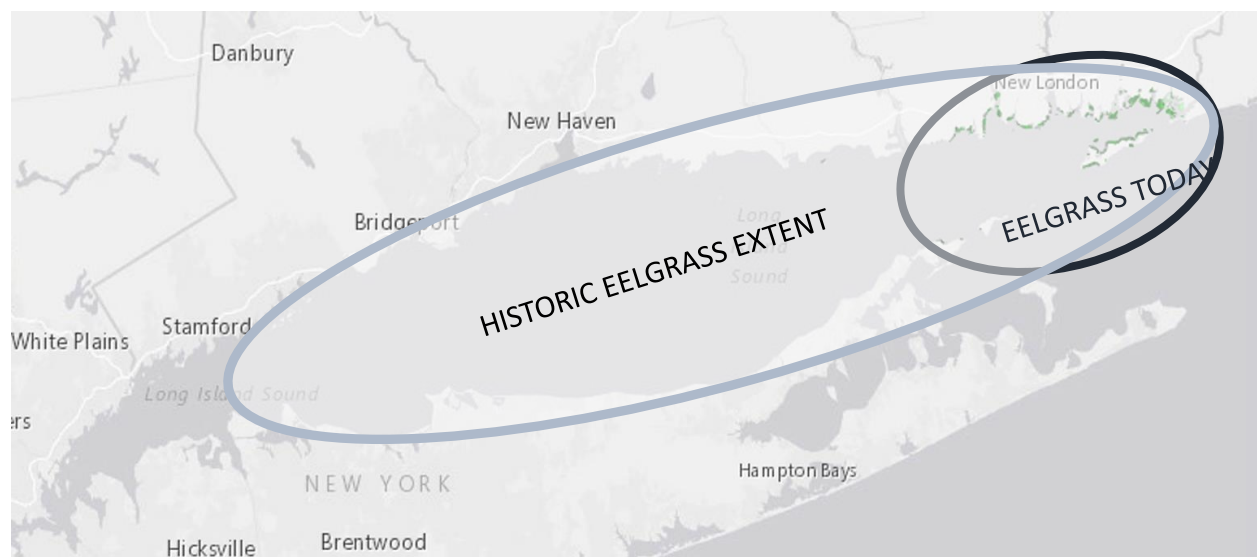
Globally, it is estimated that seagrasses are already 30% gone, and the rate of loss is accelerating. Before 1990, seagrass disappeared at a rate of about 1% per year. Since 1990, seagrass is disappearing at an estimated rate of 7% per year (2,10,23). The major drivers of decline are nitrogen pollution, climate change, physical damage, and biological impacts.

Eelgrass meadows were once abundant throughout the bays and harbors of Long Island Sound, but today, less than 10 percent of their historic acreage remains, all of which is found in the easternmost reaches of the Sound (3,6,15). This loss led to the passing of the New York Seagrass Protection Act in 2012 (14).

Fishers Island contains a significant portion of this remaining eelgrass: 24 percent of the eelgrass in all Long Island Sound and 96 percent of the eelgrass in New York's portion of the Sound (3). These meadows are in relatively good condition due to better water quality, limited development, and a low population on

the island, but are still at risk of degradation and decline if nothing is done to protect and manage them. Recent research and monitoring studies conducted at Fishers Island indicate that physical disturbances from vessels transiting and anchoring near shore, seawall and dock construction, submerged infrastructure, harbor dredging, and other human activities are threats to seagrass persistence around the island (1,5,20).

While the conditions seagrass needs to thrive in Long Island Sound are being restored through the implementation of federal, state, and local nitrogen reduction plans now underway, the protection and preservation of existing meadows is a critical factor for future habitat expansion and restoration success. Efforts at manually re-seeding eelgrass beds have yielded mixed results, leading the New York State Seagrass Task Force to note that "preserving and protecting existing eelgrass habitat is a more environmentally sound and less costly management approach" (15).



## What are the threats to eelgrass?

The health of eelgrass is impacted by several stressors. Rising water temperatures and nitrogen pollution are major stressors to eelgrass, affecting its ability to grow and thrive. Low light levels caused either by murky waters or structures shading the water, as well as physical damage also threatened eelgrass's ability to survive. Fragmentation of the meadows and over-fishing of the dependent species impact the ecosystem as a whole and reduce its resiliency. The threats to eelgrass meadows are cumulative, and compound to undermine the meadows' ability to provide ecosystem services (10).

### Physical Damage

Eelgrass is physically damaged when it is uprooted and or the rhizomes are broken. This physical damage is caused by anchors, mooring chains, propellers, and some types of fishing gear, such as rakes (15). Anchors and mooring chains can create large bare patches in the eelgrass meadows, where prop scars create long lines of uprooted eelgrass. Both forms of disturbance have not only the effect of damaging specific plants but also fragmenting the habitat thereby making it less resilient to other stressors. Physical damage is one of the primary threats to eelgrass at Fishers Island (1,6,20).



*Two prop scars running parallel to each other in an eelgrass meadow located off of Fishers Island, NY. Marc Rosenberg.*

### Nutrient and chemical run-off

Nitrogen pollution – from sewage, fertilizers, and the atmosphere - is a major cause of eelgrass decline across southern New England and New York (6,19,24). Excess nitrogen produces algal blooms that both shade the seagrass and produce toxins that can build up in both fish and eelgrass tissues. The health of seagrass meadows can be an indicator of water quality and the impacts of land-based stressors, such as excessive fertilizer use.



### Shading and turbidity

Eelgrass is a plant that requires a significant amount of sunlight for photosynthesis to create energy and grow, making light availability one of the more important factors in determining seagrass' survivability (4,9,17). Eelgrass happens to require some of the highest levels of light among all the seagrass species (8). Light may be limited from reaching the eelgrass from both docks or structures on or above the water shading the areas below and from high levels of turbidity in which high levels of sand or sediment are suspended in the water making it murky. In both cases – excessive shading and excessive turbidity, the eelgrass suffers from a lack of light and subsequent ability to make energy (17,18). Shading occurs not only from the dock itself but also from the boats at the dock. Boat propellers can create turbulence that leads to scouring of the seafloor and loss of eelgrass in that area. This can be a chronic

occurrence around docks, where boating is frequent, and the water is shallow (4) Any mitigation measures should consider both the physical structure and the use of that structure. Turbidity is caused whenever the bottom silt and sand are disturbed. Construction and dredging often cause significant turbidity and the resulting sediment can even sometimes smother the eelgrass plants as it settles out of the water.

### Rising water Temperatures

Eelgrass has a specific temperature range in which it thrives. When the water rises above this optimal, the plant suffers. Rising water temperatures are due to climate change and general ocean warming. While it is hard to mitigate this threat locally, it is important to keep it in mind as multiple stressors have a cumulative impact on the eelgrass meadows.





## Steps we can take to protect seagrass

The best way to protect eelgrass is to reduce or eliminate the threats to its survival. Based on the threats to the eelgrass meadows at Fishers Island, and the protection actions that have worked in other locations, we recommend the following actions that we can take as a community.

### Objective: Improve water quality by limiting run-off from land-based activities

To protect the eelgrass meadows that fringe the shore of Fishers Island, we must ensure that the water quality remains good. Water quality is often degraded by nutrients and chemicals running off adjacent lands. Preventing this run-off and subsequent degradation of the water is a key step in protecting our seagrass. Nitrogen enters the coastal waters from both excess fertilizers applied to land but also from leaking or faulty septic systems. When mitigating this threat, both sources of nitrogen should be addressed.

To achieve this objective, we can take the following steps and actions:

Steps	Actions
<b>Limit fertilizer run-off</b>	
Promote the best lawncare practices	➤ Hold workshops for lawncare professionals
Promote the use of native plants instead of lawn	➤ Design and promote to homeowners' fertilizer reduction and alternative programs
Create vegetative buffers between lawns and shorelines	➤ Educate ferry workers and others to maximize compliance with the New York fertilizer ordinance
<b>Limit waste-water run-off</b>	
Promote alternative septic systems	➤ Promote Suffolk County's Reclaim Our Water Initiative, which provides grants to put in alternative septic systems
Test and maintain septic systems	➤ Create a certification process to assess and document onsite septic system conditions and track maintenance.



*A green sea turtle (Chelonia mydas) swims through an eelgrass meadow on Fishers Island, NY (Tracy Brock, 2015).*

**Objective: Limit scarring and scouring of eelgrass beds from human activity**

Scarring and scouring of the eelgrass meadows create fragmentation, making the meadows less resilient to other stressors. A highly fragmented meadow is less capable of providing essential ecosystem services, such as nursery habitat for fish and other species and dampening wave action to prevent coastal erosion. As discussed, scarring and scouring can occur from mooring chains, props, and some types of fishing gear.

To achieve this objective the following steps and actions are recommended:

Steps	Actions
<p><b>Minimize scouring from moorings</b></p> <p>Convert traditional moorings that are in meadows to conservation moorings</p> <p>Place future moorings outside of eelgrass meadows</p>	<ul style="list-style-type: none"> <li>➤ Talk to mooring owners about the benefits of conservation moorings</li> <li>➤ Recommend amending the mooring permitting process to require the use of both historic and current seagrass maps and in-water surveys to determine seagrass-safe locations for siting moorings</li> <li>➤ Recommend requiring new conventional moorings to be placed at a depth that is outside of the growth range for seagrass</li> </ul>
<p><b>Minimize prop scarring</b></p> <p>Ask boaters to trim up when in shallow water and an eelgrass meadow</p>	<ul style="list-style-type: none"> <li>➤ Develop and implement education programs for best boating practices</li> </ul>
<p><b>Minimize scouring from fishing gear</b></p> <p>Ask clambers to limit the use of destructive gear types.</p>	<ul style="list-style-type: none"> <li>➤ Develop and implement education programs for best-clamming practices</li> </ul>

**Objective: Limit uprooting of eelgrass from human activity**

Like terrestrial plants, the roots of seagrasses both secure the plant and absorb nutrients needed for plant growth. When the plant is pulled up such as by an anchor, it can no longer function. Furthermore, if many patches are uprooted, the meadow habitat will become fragmented.

Limiting uprooting can be achieved through several steps:

Steps	Actions
<p><b>Minimize uprooting from anchors</b> Create voluntary no anchor zones to protect specific eelgrass meadows</p>	<ul style="list-style-type: none"><li>➤ Recommend to the Harbor Committee to establish voluntary no anchor zones in areas of heavy use such as off the 8<sup>th</sup> hole and/or near Flat Hammock</li><li>➤ Use buoys to mark eelgrass meadows and where boaters should avoid anchoring</li><li>➤ Use strategically placed signs to educate boaters and beach-goers about eelgrass</li><li>➤ Work with navigational companies to include seagrass meadows on electronic and paper maps of the area</li><li>➤ Create educational programs around best boating practices</li></ul>
<p>Create anchor zones to give recreational boaters a place to safely anchor outside of eelgrass</p>	<ul style="list-style-type: none"><li>➤ Recommend that the Harbor Committee create anchor zones, perhaps with guest moorings, in East Harbor and off the southeast end of Flat Hammock to indicate where boats can safely anchor</li><li>➤ Create and distribute materials to inform boaters where they can safely anchor</li></ul>
<p><b>Minimize uprooting from fishing gear</b> Limit destructive fishing gear types in eelgrass meadows</p>	<ul style="list-style-type: none"><li>➤ Gather more information on the impacts of various fishing gear types</li><li>➤ Educate clammers on less destructive practices for clamming.</li></ul>



*Photo of boats anchored off 8<sup>th</sup> hole (Sally Wakeman July 4, 2022)*

**Objective: Reduce shading and damage from docks and coastal construction**

Lack of light, along with rising water temperatures, is the number one threat to eelgrass. Many things can contribute to the lack of light, including poor water quality, smothering algal blooms, and physical structures and boats. Without adequate light, eelgrass cannot photosynthesize to produce the energy it needs to grow and reproduce. This section specifically addresses shading caused by humans placing structures in, on, or above the water that limits the amount of light reaching the seafloor.

<b>Steps</b>	<b>Actions</b>
<b>Minimize shading from docks and associated boats</b>	
Minimize placement of docks over seagrass	<ul style="list-style-type: none"><li>➤ Provide Town Trustees with seagrass maps and the latest seagrass data, as it comes available</li><li>➤ Document specific best practices and positive examples related to dock and coastal construction and share with community and town officials</li><li>➤ Educate homeowners on how docked boats affect eelgrass as well as permanent structures</li></ul>
Use best practices when building in seagrass meadows	<ul style="list-style-type: none"><li>➤ Maintain a list of qualified surveyors if underwater eelgrass surveys are needed.</li></ul>

**Objective: Limit turbidity from construction and other human activities**

Construction and other physical disturbances to the seafloor can create significant water turbidity. The many suspended particles diminish water clarity and the levels of light reaching the plants underwater. Low light levels are one of the most destructive threats to eelgrass. The actions to prevent turbidity from anchors, mooring chains, and other forms of physical disturbance are the same as those to prevent the physical damage to the plants and are covered there. Construction and dredging projects disturb the bottom and can cause significant amounts of turbidity. However, there are methods for reducing the turbidity and protecting eelgrass from the worse of the suspended sediments.

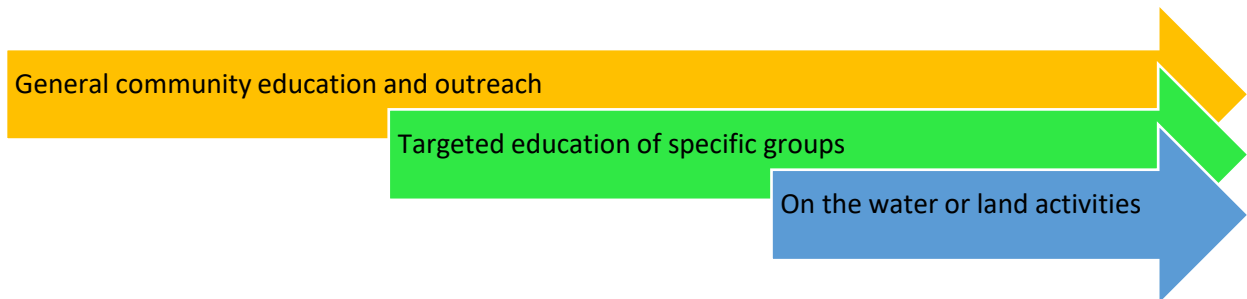
<b>Steps</b>	<b>Actions</b>
Use best practices during all coastal construction and dredging projects	<ul style="list-style-type: none"><li>➤ Promote methods and practices that minimize turbidity during construction. This may include the use of turbidity curtains, driving pilings with shallow-draft barge-mounted equipment, removal of sediment from the top of seagrass beds, and other low-impact equipment and methods</li><li>➤ Promote timing of construction projects to avoid the growing season</li><li>➤ Recommend removal of any residual sediment on eelgrass beds after project completion</li></ul>



of Hungry Point (Chantal Collier, 2017).

Boats anchored in eelgrass (dark blue area) off

## Implementing the Plan



### Raise Community Awareness

For this plan to succeed, the community and specific groups within the community will need to be well informed about eelgrass, the impacts of various activities on eelgrass, and the best practices to minimize negative impacts. The actions detailed above rely on the whole community, as well as landowners, boaters, fishermen, landscapers, and contractors to take certain actions to minimize the threats to eelgrass. This plan rests on a nested set of actions, illustrated above. Most of this plan will be implemented through the following educational activities.

#### General outreach activities

- ✓ Design and distribute up-to-date education materials that will improve public

understanding of the value, habitat requirements, status, and trends of eelgrass, and what people can do to protect seagrass

- ✓ Design and distribute education materials that will improve public understanding of the relationship between land-based activities and water quality in the Sound.
- ✓ Prepare and distribute maps to show the location of eelgrass meadows. Work with partners to include eelgrass information in boating and fishing user guides and maps.

#### Targeted Outreach to Homeowners and Landscapers

- ✓ Document best practices around lawncare to minimize nutrient and chemical run-off
- ✓ Design educational program around the use of native plants
- ✓ Design an educational program to encourage the use of vegetative buffers between lawns and the shore

#### Targeted Outreach to Homeowners and Construction Companies

- ✓ Document best practices and promote around dock construction to minimize shading of eelgrass
- ✓ Document and promote best practices to limit sedimentation and turbidity during construction projects
- ✓ Promote information about timing projects to avoid the growing season

#### Targeted Outreach to Homeowners

- ✓ Inform how leaking septic systems degrade water quality in the Sound
- ✓ Promote grant programs to replace older septic systems

#### Targeted Outreach to Fisherman and Fishing Communities

- ✓ Document best practices around fishing near seagrass meadows to inform the public to minimize the negative impact
- ✓ Design programs to promote best practices for fishing in eelgrass
- ✓ Educate fishing groups on current gear restrictions in New York

#### Targeted Outreach to Boaters and Boating Communities

- ✓ Document best practices around boating near seagrass meadows to use in informational materials
- ✓ Design programs, including on-water education, to promote best boating practices for eelgrass protection and to inform on the whereabouts of seagrass meadows.
- ✓ Create and distribute educational materials to inform about no anchor zones and anchorage areas.
- ✓ Design outreach programs targeting mooring holders to promote less harmful mooring practices
- ✓ Create a social marketing campaign to encourage boaters to trim their motors when in less than 10 feet of water



*Atlantic Silversides (Menidia menidia) swim above an eelgrass meadow on Fishers Island, NY (Brian Leuchtenburg, 2020).*

### Gathering More Information

While both the threats to eelgrass and the measures to mitigate those threats are well documented (see the technical companion to this plan found on [fiseagrass.org](http://fiseagrass.org)), there are still several research needs. Research and monitoring are needed so that we can both better understand the specific local threats to our eelgrass meadows and evaluate the impacts of these protection measures. As such, we recommend the following research and monitoring activities.

#### **MONITORING**

**Recommendation: Build an established, consistent, and comprehensive eelgrass monitoring program.**

Actions:

- Coordinate efforts with other Long Island Sound seagrass mapping initiatives.
- Continue and expand the Marine Protected Area (MPA) Watch program to understand the uses of nearshore waters and any changes in those uses.
- Continue and expand the University of Rhode Island (URI) Watershed Watch program to monitor water quality around Fishers Island

- Perform in-water eelgrass monitoring and mapping efforts to ground truth aerial surveys and assess eelgrass ecosystem conditions.
- Explore ways to monitor conditions of septic systems as an alert for system failures.
- Ensure results are reported to and easily accessible by stakeholders, local governments, and other permitting government agencies.

#### **RESEARCH**

**Recommendation: Improve our knowledge and understanding of eelgrass through research initiatives to ensure that efforts to protect the resource are successful and effective.**



Actions:

- Establish partnerships with area universities, the Navy, and the Connecticut National Estuarine Research Reserve (NERR) to promote sharing of research and monitoring needs and information.
- Link with Connecticut NERR to compare seagrass meadows in and out of NERR and in and around Fishers Island.
- Explore the potential positive and negative effects of aquaculture on seagrass and document this locally.
- Establish a program to monitor local fish populations and compare them with other populations in Long Island Sound
- Establish a program to monitor nitrogen run-off into Fisher Island waters and trace its sources
- Evaluate monitoring and survey data every five years and adjust management activities as necessary.

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