TOWN OF SOUTHAMPTON
Department of Community Preservation
24 W Montauk Hwy, Hampton Bays, NY 11946
Ph: 631-287-5720 Fx: 631-728-1920
WWW.SOUTHAMPTONTOWNNY.GOV/CPF

COMMUNITY PRESERVATION FUND (CPF)
WATER QUALITY IMPROVEMENT PROGRAM
CHECKLIST/APPLICATION INSTRUCTIONS

The CPF Water Quality Improvement Project Plan (WQIPP) Fund follows the objectives in the adopted Water Quality Improvement Project Plan (see http://www.southamptontownny.gov/DocumentCenter/View/7318)

To apply for funding, an application must be **COMPLETED** and submitted along with detailed narratives and supporting information as described below. The Water Quality Advisory Committee will rank and score projects based on the Scoring Criteria contained in the application materials. Parcel acquisitions will be considered on an ongoing basis, independent of this application process.

Note: 7-full sets of plans and one digital submission is required for each application.

WATER QUALITY IMPROVEMENT PROJECT MEANS:

[1] DEFINITIONS:

1. **Wastewater Treatment Improvement Project** means the planning, design, construction, acquisition, enlargement, extension, or alteration of a wastewater treatment facility, including alternative systems to a sewage treatment plant or traditional septic system, to treat, neutralize, stabilize, eliminate or partially eliminate sewage or reduce pollutants in treatment facility effluent, including permanent or pilot demonstration wastewater treatment projects, or equipment or furnishings thereof. **Stormwater collecting systems and vessel pumpout stations shall also be included within the definition of a wastewater improvement project.**

2. **Nonpoint source abatement and control program projects** developed pursuant to section eleven-b of the soil and water conservation districts law, title 14 of article 17 of the environmental conservation law, section 1455b of the federal coastal zone management act, or article forty-two of the executive law;

3. **Aquatic Habitat Restoration Project** means the planning, design, construction, management, maintenance, reconstruction, revitalization, or rejuvenation activities intended to improve waters of the state of ecological significance or any part thereof, including, but not limited to ponds, bogs, wetlands, bays, sounds, streams, rivers, or lakes and shorelines thereof, to support a spawning, nursery, wintering, migratory, nesting, breeding, feeding, or foraging environment for fish and wildlife and other biota.

4. **Pollution Prevention Project** means the planning, design, construction, improvement, maintenance or acquisition of facilities, production processes, equipment or buildings owned or operated by municipalities for the reduction, avoidance, or elimination of the use of toxic or hazardous substances or the generation of such substances or pollutants so as to reduce risks to public health or the environment, including changes in production processes or raw materials; such projects shall not include incineration, transfer from one medium of release or discharge to another medium, off-site or out-of-production recycling, end-of-pipe treatment or pollution control.

5. **The Operation of the Peconic Bay National Estuary Program**, as designated by the United States Environmental Protection Agency. Such projects shall have as their purpose the improvement of existing water quality to meet existing specific water quality standards. Projects which have as a purpose to permit or accommodate new growth shall not be included within this definition.

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WATER QUALITY IMPROVEMENT PROGRAM
PROPOSAL SUMMARY

Project Applicant: Cornell Cooperative Extension of Suffolk County

Project Title: Shellfish and Habitat Restoration in Support of Water Quality Improvement

Project Manager: Kimberly Barbour

Name	Kimberly Barbour
Title	Outreach Manager
Organization	Cornell Cooperative Extension of Suffolk County
Address	423 Griffing Avenue
Phone	631-461-5294
Email	kp237@cornell.edu

Property Owner (if different from Project Manager organization):

Name	Southampton Town Department of Parks and Recreation
Affiliation	Town of Southampton
Mailing Address	6 Newtown Road Hampton Bays NY 11946
Phone	631-728-8585
Email	parksandrec@southamptontownny.gov

Project Location

Address	89 Dune Road
SCTM#(s)	472689 386.000-00001-029.000

Type of Project (check all that apply):

- ☐ **Reduction**
- ☐ **Remediation**
- ☑ **Restoration**

Project Summary: (add text 2-3 Sentences only)

Through expansion of shellfish and plant nursery operations at Tiana Bayside Facility, CCE Marine Program will produce bay scallops, oysters, and clams; cultivate marsh and dune grass; and expand local eelgrass meadows in order to improve local habitat and reduce excess nutrients in Southampton Town waters.

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1. PROJECT TYPE

Must meet at least one of the definitions of "Water Quality Improvement Project" per State Law Chapter 551 cited above. Check all that apply.

- ☐ **Wastewater Treatment Improvement Project**
- ☐ **Non-point source abatement and control**
- ☑ **Aquatic habitat restoration**
- ☐ **Pollution prevention**
- ☐ **Operation of Peconic Bay National Estuary Program (Grant Match)**

Note: Monitoring costs are only potentially eligible for CPF funding within Aquatic habitat restoration projects.

2. PRIORITY AREA(S)

Priority areas are defined in the Water Quality Improvement Project Plan (WQIPP).

- ☑ **High**
- ☑ **303(d) Impaired**
- ☐ **Medium**
- ☐ **Outside High and Medium priority areas***

*If Outside High and Medium priority areas, explain how the project is relevant to WQIPP goals.

3. PROJECT DESCRIPTION

3a. Existing conditions of applicable groundwater/sub-watershed/waterbody and most recent and relevant data available (provide sources).

Please see attached narrative that details conditions of nursery site, and potential restoration sites.

3b. How the proposed solution addresses the issue in the context of Reduction, Remediation and/or Restoration as per the CPF Water Quality Project Plan. Note all remediation and restoration projects must assure that reduction measures are also addressed.

The restoration work to be conducted will directly attribute to nitrogen reduction via shellfish filter feeding and uptake of nutrients by coastal and marine plants.

3c. Describe the proposed technology and its demonstrated efficacy in similar settings. May include published data.

CCE has over 30 years of experience in shellfish aquaculture and coastal and marine plant restoration. Restoration methodology developed by CCE experts has been showcased in numerous scientific publications.

3d. How the project supports Town of Southampton, Suffolk County, NYSDEC, Long Island Nitrogen Action Plan (LINAP) or other adopted goals/policies (provide references with pages numbers).

The project supports numerous adopted polices and goals, please see attached narrative for additional details.

3e. Review the following statements and indicate whether they are applicable to your project. For all "Yes" responses, please indicate how your project addresses the requirements indicated.

Yes	N/A	
☐	☑	**If stormwater system or drainage is proposed:** The project must indicate compliance with the New York State Stormwater Design Manual (2015 and as updated).
☐	☑	**If project is related to farmland**: Describe any Agricultural Stewardship Plan or other long term strategy for Nitrogen abatement.
☑	☐	**If the project is for habitat restoration:** The narrative must address how underlying causes are being ameliorated and expected outcomes for local species populations or other ecological considerations are given.
☐	☑	**If project is a Sewage Treatment Plant (STP) or cluster treatment system:** Fund allocation request is based on cost for reduction of pre-existing conditions and not for purpose of accommodating new density (describe pre-existing density and associated flow (gallons per day) and total projected nitrogen reduction in narrative). Include detailed information on how many homes the system would treat as well as potential for formation of Sewer District, if required by Suffolk County Health Department or Town Law.
☐	☑	**If the project is requesting grant match for the Peconic Estuary Program:** Include information related to funding program source and purpose of application and any relevant items on this checklist. Note: A Town Board resolution will be required in order to encumber matching funds for grant applications.

4. WATER QUALITY BENEFIT

4a. Identify Nitrogen, Pathogen or Pollutant of Concern (POC) including Existing Condition and Target Reduction.

The pollutant of concern targeted through this project is primarily nitrogen. Please see attached narrative for additional information.

4b. Describe plans for collecting and reporting on water quality over time.

Please see attached narrative for details on monitoring activities planned in support of this project.

4c. Indicate useful life of proposed technology (must meet or exceed five years).

The targeted restoration plantings will continue to benefit the areas waters on a long term basis, please see narrative for additional details.

5. COST FACTORS

5a. Explain how you have confirmed that the proposed budget is reasonable, appropriate and necessary. If available, provide third party estimates or other documentation of how costs were determined.

Budget justification is provided in attached narrative.

5b. Describe any matching funds to be provided.

Project match will be provided, please see attached budget justification.

5c. Explain: i. Why project cannot proceed and intended benefits cannot be achieved without external funding. ii. if funds are awarded at a lower level than requested, or if there are cost overruns, explain how the project will proceed.

Please see attached budget justification for additional information.

6. MANAGEMENT, EXPERIENCE, ABILITY

6a. Describe applicant's experience in completing similar projects.

CCE Marine Program has over 30 years experience in all proposed activities, please see attached narrative.

6b. Describe community support or opposition to project. If there is opposition, explain how this is to be addressed.

CCE has widespread community support of existing intitiatives at Tiana Bayside Facility, please see narrative.

6c. Describe any permits needed and time frame/status of approvals. If permits are approved, indicate same.

Existing permissions are in place to operate a shellfish and coastal plant nursery at the site, please see narrative for additional details.

7. MAINTENANCE, MONITORING, EVALUATION

Estimate ongoing maintenance costs and explain how these will be supported. Explain stewardship and monitoring activities planned for ensuring sustainability of the project.

The project has been designed to provide ongoing water quality benefits beyond the life of the project, please see narrative for additional details.

8. DURATION OF PROJECT

8a. Provide a projected project timeline. Note: The Committee will only make recommendations for shovel-ready projects that can commence this fiscal year.

The project is ready to commence in Fall 2020, please see narrative for additional details.

8b. If project is multi-year or phased, provide a breakdown of budget and milestones for each year and phase.

Please see narrative for breakdown of budget and milestones.

9. ATTESTATION

Allocation of CPF funds will not be for the purpose of accommodating new growth, as this is prohibited by State law.

☑ **Check box to certify that funds will not be directed for projects for the purpose of accommodating new growth.**

Signature: _____ **Date** 8/16/20

10. REQUIRED ATTACHMENTS

Confirm that the following required documents are attached to this application:

- ☐ Photos of existing conditions
- ☐ Location Map
- ☐ State Environmental Quality Review Act (SEQRA) Long or Short Environmental Assessment Form (EAF) (https://www.dec.ny.gov/permits/6191.html)
- ☐ Completed EPA Spreadsheet Tool for Evaluating Pollutant Load (STEPL) **http://it.tetratech-ffx.com/steplweb/** or similar standardized methodology (describe)
- ☐ Project budget (see attached template)
- ☐ Ownership commitment is provided via letter of intent (LOI) for non-municipal owners or municipal resolution for municipal owners

11. OTHER ATTACHMENTS

List other attachments provided, including cost estimates, bids, plans, documentation of matching funds, and other as appropriate to demonstrate project readiness, quality, feasibility, and cost effectiveness.

Shellfish and Habitat Restoration in Support of Water Quality Improvement:
Expansion of Tiana Bayside Facility Shellfish and Plant Nursery Operations, and Subsequent Restoration Plantings in Southampton Town

Submitted by:
Cornell Cooperative Extension Marine Program

Background:

In order to better address the ever increasing need to engage and educate residents and visitors relating to marine and coastal issues, and produce shellfish and plant material for local restoration projects, Cornell Cooperative Extension of Suffolk County (CCE) partnered with the Town of Southampton (Town) to develop a marine education and stewardship center at Tiana Bayside Recreational Facility (Facility). In 2016 CCE entered into a licensing agreement with the Town of Southampton to operate out of the Facility and grounds, which is located at 89 Dune Road, Hampton Bays NY. The waterfront nature of this location makes it ideal to expand CCE's aquaculture programs, coastal and marine habitat restoration projects, and related community stewardship and youth education efforts. Through the installation of floating upweller systems (FLUPSYs) to house millions of clams and oysters; addition of bay scallop grow out lines to the property; expansion of coastal plant grow out boxes; and installation of tanks to support expansion of spat-on-shell-oyster reef and local eelgrass restoration efforts, we will be able to significantly expand the capacity of this facility to serve as a shellfish nursery, and coastal and marine habitat restoration hub. The result of these activities will include enhancement of local habitat, wildlife and biodiversity, along with the removal of nutrients from the water column and improvements to coastal resiliency in Southampton Town. The site will also serve as a destination for community programming, and the improvements made will make the property more functional in terms of education and outreach potential.

Project Description:

Expansion and Operation of Satellite Shellfish Nursery

This satellite location serves to enhance the efforts of CCE Marine Program, in partnership with Southampton Town, to improve local water quality by providing for additional growout space and the ability to diversify production of shellfish. The site is ideal for use as a satellite nursery area and has been operating as such on a limited scale by serving as a host location for CCE SPAT (Suffolk Project in Aquaculture Training) Program's community oyster garden, and housing a floating upweller (FLUPSY) and land based upweller on site. The proposed project would enable these efforts to be scaled up and will include cultivation of the following species for use in population enhancement efforts in Southampton Town waters: hard clam (*Mercenaria mercenaria*), oyster (*Crassostrea virginica*), and bay scallop (*Argopecten irradians*). This will be achieved through the following tasks:

- ***Deployment of Additional FLUPSYs*** In order to accommodate the millions of shellfish to be grown and subsequently seeded in Town waters, additional floating upweller systems (FLUPSYs) will be deployed at Tiana Bayside Facility. A letter of permission for one FLUPSY at this site was granted by the Town Trustees, and an additional request for permission will be filed at the start of the project period. CCE's team of experts and technicians will manufacture and install these units, and they will be stocked with shellfish and maintained by CCE staff and community volunteers.

- ***Establishment of a Bay Scallop Grow Out Nursery Area and Planting 40mm+ Bay Scallops in Town waters.*** This project component would incorporate over 15 years' experience of the CCE Bay Scallop Restoration Program operating out of Cedar Beach, Southold, NY. Presently, this program has in place, and successfully operating, all required components to culture, plant and monitor bay scallop restoration including:
    1. A state of the art shellfish hatchery,
    2. 20 years' experience spawning and culturing bay scallops,
    3. A nursery and longline grow out system and vessels to service them.

  This project would expand the nursery system to include the Tiana Beach site. This expansion would include establishing a nursery net system in conjunction with the floating dock infrastructure at Tiana Bayside Facility. The production sequence would include, spawning bay scallops in June 2021, placing scallops in nursery systems in Goose Creek Southold and Tiana Bayside Hampton Bays in July, and, further growing out those scallops in the longline system in Orient Harbor to a planting size of 40+MM by late November. These scallops would then be planted in Southampton Town waters. The methods used in this process have, in the past, resulted in establishing bay scallop populations that improve water quality through nutrient removal by filter feeding bay scallops. In short, the nutrients in microscopic algae are transformed into economically valuable bay scallops. This effort will also begin planning to expand into creation of a spawner sanctuary system for bay scallops in Southampton waters in the future.

- ***Installation and Maintenance of Holding Tanks***
  In addition to growing out clam seed shellfish and oysters (spawned at CCE's Southold facility) to larger size to enhance long term survival and overall planting success, the site will also support the use of seawater tanks for remote setting of oysters for spat-on-shell "reef" structures. These tanks will serve a dual purpose as they will also assist in eelgrass habitat restoration efforts, enabling adult shoots to be held prior to Marine Meadows Workshops, and for fully assembled planting units that result from these workshops to be stored until restoration planting can be conducted. This will limit the transport of plants and subsequent stress they experience, resulting in a higher likelihood of restoration success.

Expansion and Operation of Coastal Plant Nursery

In efforts to expand current coastal plant production effort, the Coastal Plant Nursery will be expanded and maintained. This work involves primarily propagation of beach grass (*Ammophila breviligulata*) and cord (marsh) grass (*Spartina alterniflora*) for sand dune and salt marsh plantings, respectively. Propagation of these species involves grow out in sand filled trays, small flats or pots and free planting into the native sand. This site will offer ample opportunity to establish additional grow out beds that can be tended by CCE employees, volunteers, and school groups. The process of growing local native seed stock is an important part of proper coastal stewardship and restoration and offers a unique opportunity to educate the public and develop effective stewards. Plants produced at this site would be used for planting in surrounding areas to improve coastal resiliency and habitat availability in support of Water Quality Project Plan goals.

Restoration Plantings in Support of Water Quality Objectives
In coordination with the Southampton Town Trustees, appropriate receiving areas for all of the shellfish, eelgrass, and coastal plants will be determined. Over the project period it is expected that the following restoration targets will be achieved:

- Deployment of Spat-on-Shell Oyster Reef: Oysters will be spawned at CCE's shellfish hatchery and larvae will be delivered to Tiana Bayside for remote setting in the holding tanks to be installed at the property, with supplemental space being made at CCE's hatchery facility if needed in order to obtain a yield of approximately 30mil spat-on-shell oysters per year. Oysters will be set on recycled shell, grown out in the circulation tanks and deployed at receiving areas within Southampton Town waters.
- Hard Clam and Single Oyster Seeding: Hard clams and oysters will be grown in the FLUPSYs at Tiana Bayside Facility during the project period. The FLUPSYs will receive clam and oyster stock produced by CCE in early summer of each year of the project period. The shellfish will be delivered on site and cared for throughout the growing season by staff, and volunteers from CCE's SPAT Program and Back to the Bays Initiative. To the extent possible, these volunteers will also play a role in the seeding of the shellfish at the designated receiving areas, enabling a unique stewardship experience to be offered to those looking to play a role in the improvement of local water quality via shellfish restoration activities.
- Bay Scallop Seeding: 250,000 bay scallops 40mm (shell height) or larger will be free planted in Southampton Town waters.
- Eelgrass Restoration Plantings: Approximately 50,000 shoots of eelgrass will be prepared for planting via CCE's burlap disc method. Utilizing Marine Meadows Initiative volunteers, ten community workshops will be held at Tiana Bayside Facility engaging the public in the opportunity to work side by side with CCE's eelgrass experts. Volunteers will weave eelgrass shoots into specially designed burlap planting units that will be stored in holding tanks following each workshops until CCE's team of divers are ready to deploy the planting units at the designated eelgrass restoration receiving areas.
- Coastal Plant Restoration: Additional grow out boxes will be added to the Tiana Bayside Coastal Plant Nursery enabling efforts to grow beach grass and marsh grass to be scaled up. The plant material produced will be made available to the Town for use in coastal improvement and shoreline resiliency projects.

Community Education and Outreach Component:
In order to engage the public in the various science-based restoration projects to be conducted as part of the proposed project, monthly workshops will be held. These "Back to the Bays Stewardship Sessions" will serve the purpose of keeping the public informed about what is going on at this site, explaining the various types and phases of shellfish and habitat restoration activities that will be taking place on site throughout the year, and introducing participants to the more in-depth volunteer opportunities that will be made available through this project. These sessions will consist of a brief lecture, tour of the site, and hands-on opportunity to assist in an activity related to shellfish cultivation and plant propagation. At the end of each session, attendees will be offered an opportunity to become official CCE Marine Program volunteers, which will enable them to further assist in the maintenance of the FLUPSYs, care of bay scallops, cleaning and sorting or clams and oysters, Spartina seed collection, and more.

In addition to the free monthly Back to the Bays Stewardship Sessions, in the fall months CCE's Marine Meadows Program will conduct several workshops designed to involve the community in the assembly of eelgrass planting units that will be deployed at the restoration sites by CCE's dive team. These workshops help increase the scope and scale of eelgrass restoration efforts, while providing a meaningful hands-on educational opportunity to help play a part in an important effort to help improve marine habitat and water quality in Southampton Town's waters.

The overall education and outreach efforts will play a role in addressing land based and human related impacts to water quality. As part of each session or workshop, CCE staff will address best management practices related to decreasing nutrient input to ground and surface water, and making the connection that land-based practices impact the marine and coastal plant and animal populations in our local waters. These pollution prevention recommendations, combined with the opportunity to assist in the enhancement of populations of the target project species will further instill a sense of environmental stewardship in the community, which will help the long-term water quality improvement goals of the Town of Southampton.

Issue and Solution in Context of CPF Water Quality Project Plan:
The combining of numerous shellfish and plant types into a multifaceted habitat restoration project as proposed, is a specifically identified recommended action referenced in the WQIPP. The Coastal Habitat Restoration section (p. 89) notes: *"*Restoration of coastal habitats includes establishing and/or enhancing estuary salt marshes, eel grass beds, as well as shellfish and oyster beds together as an ecosystem. When considering restoration of coastal habitats, implementing these ecosystems jointly should be considered."

The proposed project would take place primarily within the Shinnecock Bay region, one of the nine priority regions listed in the WQIPP as being "in particular need of aquatic habitat and watershed restoration." (p. 83)

Additionally, the proposed work specifically addresses Restoration Strategic Goal 2: Maintenance and enhancement of biodiversity including fin and shell fisheries, wildlife, submerged aquatic vegetation, wetlands, marine life and native upland flora. (p. 83)

How the project supports Town of Southampton, Suffolk County, NYSDEC, or other adopted goals/policies (reference plans and page numbers):

Town of Southampton:
In addition to the aforementioned alignment of project goals as listed in the WQIPP, the proposed activities will lead to the creation of habitat, which is essential to meeting many of the goals of the Town and Town Trustees. As noted in the Trustee's Marine Resources Management Plan (p. 21), "the most ecologically valued SAV in Southampton waters is eelgrass (*Zostera marina*)." The proposed work will help expand upon CCE's past efforts to restore this essential plant species in Town waters utilizing proven methodology. This will also help fill the information gap on SAV referenced on p. 26 of the plan.

Suffolk County:

The proposed work builds upon what Suffolk County WQPRP funding helped establish at Tiana Bayside in 2016. The existing shellfish and plant nursery was funded through the County, with the support of Southampton Town Parks and Recreation Department, and the expansion and increased capacity the current proposal would enable be a good extension of this initial work.

Suffolk County has historically provided annual funding for CCE's Bay Scallop Restoration Project, enabling measurable improvements of our local bay scallop populations to be achieved. By growing this effort through establishment of a bay scallop nursery and dedicated spawner sanctuaries in Town waters, even greater economic and environmental impacts will be realized.

LINAP:
This project specifically addresses identified actions for nitrogen reduction as put forth by the Long Island Nitrogen Action Plan. The LINAP Scope document indicates in section 6.16 that coastal restoration project can improve tidal exchange within impacted embayments and the improved function of coastal wetlands and ecosystems can contribute to the improved water quality and overall health of these systems (p. 32). The document also identifies bio-extraction activities, including shellfish aquaculture, as items to be considered. Per the LINAP Nutrient Bioextraction Initiative, "Nutrient bioextraction combines growing and harvesting shellfish and seaweed for the purpose of removing nitrogen and other nutrients from coastal waters. Nutrient bioextraction can reduce nutrients as the shellfish and seaweed use nitrogen and phosphorus to grow and develop, in the same way land plants do. In addition to removing excess nutrients, shellfish and seaweed provide other benefits such as creating habitats for fish and other marine life, making nutrient bioextraction a valuable strategy in helping to improve water quality."

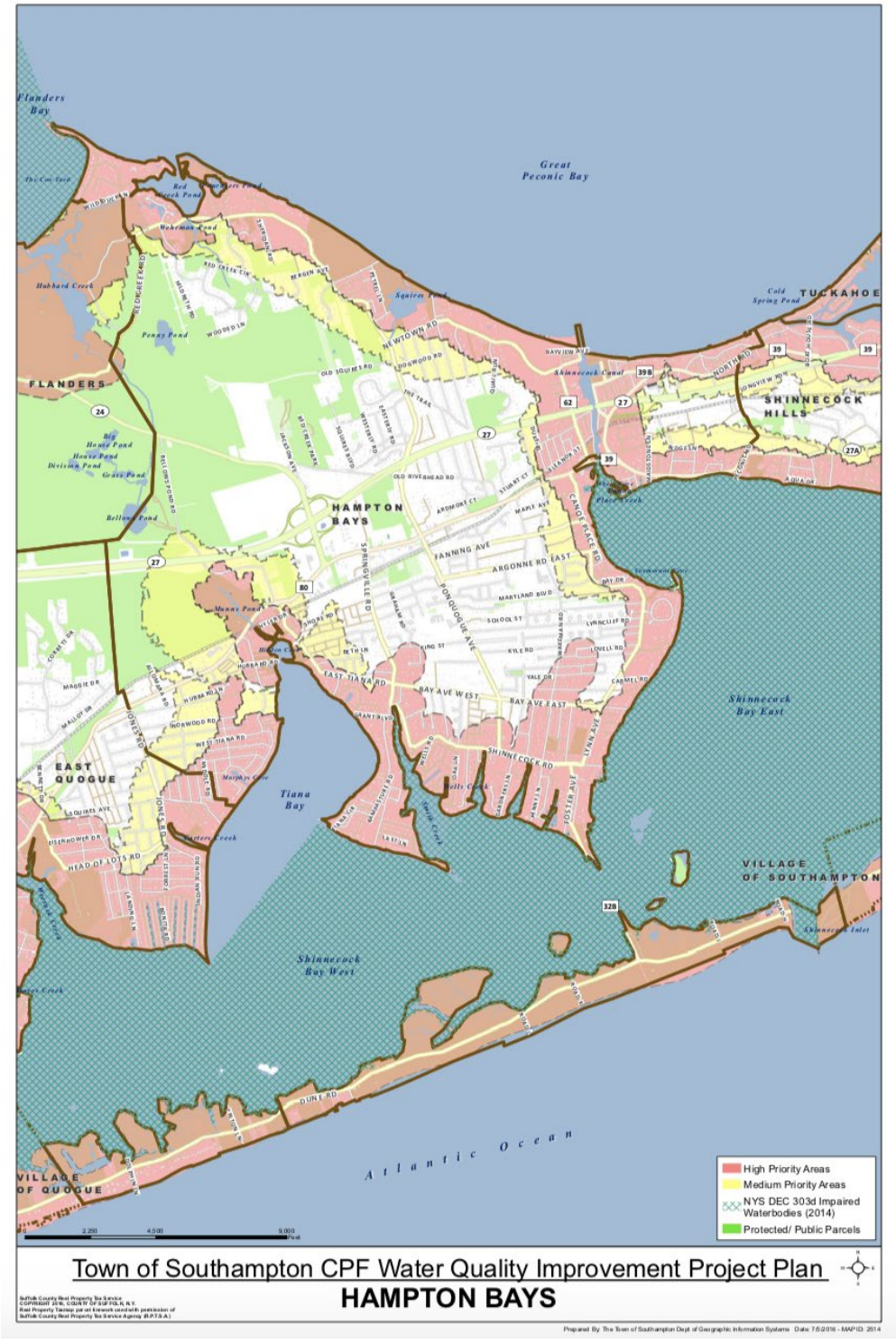
Furthermore section 6.2 of the LINAP Scope document identifies public education and citizen science being priorities in order to encourage community education regarding the importance of healthy ecosystems, and actions that can be taken to reduce nitrogen pollution (p. 27). The proposed project will enable such public education to be conducted.

South Shore Estuary Reserve:
The project addresses this follow goals as noted in the SSER CCMP: Improve the ecological function and productivity of the estuary by increasing the quality and quantity of its wetlands (Ch. 3 Rec. 4); Increase molluscan shellfish populations for commercial harvest through enhancement of shellfish stocks and improvements in water quality (Ch. 3 Rec. 7); Support productivity of commercially and ecologically important estuarine species by sustaining existing habitats of high functional quality and restoring degraded habitats, particularly submerged aquatic vegetation (SAV) beds and shallows.

Expected Outcomes:
CCE Marine Program has been in operation for 35 years, and in such time has extensive proven success in shellfish aquaculture, habitat restoration, and public outreach initiatives. The expertise that will be brought to this project will help ensure the highest level of success in attaining ecological benefits derived from the restoration methodologies to be applied as a result of the proposed scope of work. The outcomes expected as a result of the proposed project will directly impact the quality of Southampton Town's waters by enhancing filter feeding shellfish populations, improving coastal resiliency through targeted coastal and marine habitat restoration,

and paving the way for long term stewardship and engagement of the local community in these efforts based out of Tiana Bayside Facility.

Water Quality Benefit:
The waters in which the proposed restoration activities will be designed to improve (primarily Shinnecock Bay West) are listed as impaired, and designated as high priority in the WQIP.



The pollutant of concern targeted through this project is primarily nitrogen. Shellfish are effective filter feeders and capable of removing nutrients from the water column (Newell, R. 2004; Rose, J. et al. 2015; Alber and Valiela, 1996). The millions of shellfish that will be produced and deployed in Southampton Town waters will enable these nutrient reduction capabilities to result in positive changes to water quality. The amount of shellfish produced and seeded will be documented and survivability (and projected harvest rates where appropriate) will be monitored in order to provide a projection of estimated nutrient reduction in the final project report. The expected benefit of shellfish restoration as proposed will expand beyond 5 years.

Salt marshes have the potential to intercept nitrogen that could otherwise impact coastal water quality. Marsh grass like the *Spartina alterniflora* to be propagated in the Tiana Bayside Coastal Plant Nursery play a central role in nutrient interception by retaining N in above and below ground tissue. This particular species has shown "...total N uptake into above- and belowground tissues as 154 mg N·m−2·d−1." (Hill, T. et al. 2018). Eelgrass has also been shown to have a positive impact on denitrification (Zarnoch, C. et al. 2017). The eelgrass and coastal plants will both continually serve a role in nutrient reduction for their entire lifecycle and play a role in further natural recovery of these species, providing a long-term expected benefit.

The education and outreach aspect will also address water quality improvement goals. The impacts of anthropogenic and land-based inputs will be address in each Stewardship Session and workshop held at the Tiana Bayside Facility through the project duration. Signage will also be designed with the intention of explaining the benefits of the various shellfish and plant restoration activities happening at this site, and how people can get involved, and play a role in reducing nitrogen inputs to local waters.

Alber, M. and I. Valiela 1996 Utilization of microbial organic aggregates by bay scallops *Argopectin irradians*. Journal of Experimental Marine Biology and Ecology 195 (1996) 71-89.

Rose, J.M., Bricker, S.B., and J. G. Ferreira 2015 Comparative analysis of modeled nitrogen removal by shellfish farms. Marine Pollution Bulletin Vol 91, Issue 1, February 2015, 185-190.

Newell, RIE 2004 Ecosystem influences of natural and cultivated populations of suspension-feeding bivalve molluscs: a review. Journal of Shellfish Restoration 23: 51−61.

Zarnocha, C.B., Hoelleinb, T.J, Furmanc, B.T, and Peterson, B.J. 2017
Eelgrass meadows, Zostera marina (L.), facilitate the ecosystem service of nitrogen removal during simulated nutrient pulses in Shinnecock Bay, New York, USA. Marine Pollution Bulletin Vol 124, Issue 17, July 2017: 376-387.

Hilla, T.D., Sommerb, N.R, Kanaskiec, C.R., Santosd, E.A., Oczkowski, A.J. 2018 Nitrogen uptake and allocation estimates for *Spartina alterniflora* and *Distichlis spicate*. Journal of Experimental Marine Biology and Ecology 507 August 2018: 53-57.

Project Readiness & Support:

CCE has permission to operate the Tiana Bayside Facility per Licensing Agreement and Town Board Resolution 2017-50. This agreement enables CCE to operate a Coastal Plant Nursery and Shellfish Nursery on site. Additionally, CCE has obtained a Letter of Permission from the Town Trustees enabling the installation a FLUPSY on site in support of expanded shellfish restoration goals. Additional permissions will be sought for this project to enable two additional FLUPSYs and the bay scallop nursery set up to be installed at Tiana Bayside. In terms of the offsite production this project will support, CCE has in place all permits required to operate its Cedar Beach facility, including all field nursery systems.

CCE has been working with the Town and Trustees for 20 years to assist in shellfish enhancement efforts by cultivating shellfish for the Town's seeding program. CCE has also works closely with the Trustees to obtain permissions to conduct eelgrass restoration activities in Town waters. The current project will be an extension of these previous efforts and enable additional areas throughout Town waters to become receiving areas for the clams, oysters, bay scallops and eelgrass plantings that will be enabled as a result of this project. The coastal plants propagated at the site will be made available for the Town and Trustees to utilize in various coastal resiliency and habitat restoration projects throughout Southampton Town.

Numerous elements of the project will begin immediately upon award announcement. Given the close working relationship CCE has cultivated with Town and State regulators, and the previous shellfish and habitat restoration activities conducted within the Town it is envisioned that final restoration/receiving areas will be approved of quickly and the project timeline is realistic.

Once the project is kicked off it is envisioned the numerous existing community supporters (SPAT and Back to the Bays Members, local school groups, concerned citizens) will provide volunteer time and other support as needed to help ensure project goals are met. CCE currently works with a strong base of volunteers and students at Tiana Bayside Facility and the increased opportunity for involvement in water quality improvement efforts through these shellfish and habitat restoration activities is something that will be welcomed.

Project Timeline

This project will be conducted over a 26-month project period. The first portion of the project period will be devoted to site planning, working with the Trustees to determine the preferred receiving areas for the shellfish and plants, doing initial test plantings, and building capacity at CCE's shellfish hatchery to produce the algae and shellfish needed to meet project goals.

Year one (2021) will focus on the expansion of the shellfish and coastal plant nursery, including procuring installing any new equipment on site, and finalizing restoration receiving areas. The site will be prepared to function fully by Summer 2021 in which time millions of shellfish and tens of thousands of coastal plants will be grown at the facility. Fall 2021 will be the timeframe for the first round of largescale shellfish and eelgrass deployments, as well as seed collection efforts in support of the coastal plant nursery operation however, test plantings of bay scallops and eelgrass can occur during late Fall 2020 if all contract paperwork has been completed.

The second full project year will be solely focused on production, and community engagement will be a priority for the duration of the project period. CCE stands ready to conduct all

proposed activities, despite COVID-19 related challenges. All current shellfish and habitat related projects have been continuing, with various accommodations being made in regards to health and safety and we do not anticipate project delays for any new proposed work.

Proposed Timeline: November 2020-December 2022

- November-December 2020: Initial planning, sourcing of equipment, test scallop and eelgrass plantings.
- December-March 2021: Cultivation of algae in CCE's Hatchery
- January-March 2021: Obtain permits and permissions in support of expansion of Tiana Bayside shellfish and coastal plant nursery, begin cultivation of algae and preparation of shellfish spawning activities in CCE's hatchery
- March-June 2021: Spawning of oysters, clams, and scallops. Planting site planning and coordination with Town officials.
- May-July 2021: Eelgrass restoration site scouting and selection based on test plantings and monitoring.
- June-July 2021: Installation of scallop lines, FLUPSYs, circulation tanks, and planting boxes.
- July-September 2021: Shellfish grow out at Tiana Bayside Facility.
- August 2021: Spat-on-Shell Oyster Reef Deployment 1.
- September-November 2021: Marine Meadows Workshops and subsequent eelgrass plantings.
- October-November 2021: Shellfish Seeding 1 (oyster, clam, bay scallop)
- December-March 2022: Cultivation of algae in CCE's Hatchery
- March-June 2022: Spawning of oysters, clams, at CCE's Hatchery
- May-June 2022: Monitoring at Seeding/Deployment 1 sites
- July-September 2022: Shellfish grow out at Tiana Bayside Facility
- August 2022: Spat-on-Shell Oyster Reef Deployment 2
- October-November 2022: Shellfish Seeding 2 (oyster, clam)
- September-November 2022: Marine Meadows Workshops and subsequent eelgrass plantings
- Ongoing (May 2021-November 2022): Monthly Back to the Bays Stewardship Workshops

Maintenance, Monitoring and Evaluation:

- **Shellfish**

  The shellfish restoration activities to be conducted through this project represent a significant expansion that will complement existing ongoing efforts that benefit Southampton Town waters including the Tiana Bayside SPAT Program Oyster Garden, and the shellfish seeding services CCE supports the Town Trustees in conducting. Collectively these activities represent a significant opportunity for nutrient removal and it is envisioned all efforts will continue in support of Southampton Town's water quality improvement goals. The expected outcomes and summarization of techniques to be employed to evaluate success are as follows.

  Spat-on-Shell Oyster Reef Deployments:

  Expected Outcomes:

• Establishment of new oyster reef habitat as a result of spat-on-shell deployments
• Increased nutrient removal from water column
• Evidence of successful growth and new oyster recruitment at all sites
• Creation of habitat for recreational and commercially important finfish and shellfish

Evaluation Techniques:

Post seeding monitoring activities will be conducted after each deployment of shellfish and spat-on-shell to asses survival and estimate impacts on nutrient removal.

• Annual evidence of successful recruitment measured by increase of densities on reef and observed increases in percent cover
• Positive or neutral change in reef height from original structure over course of monitoring period
• Observations of increased habitat utilization by faunal species

Free Planting of Bay Scallops, Oysters and Clams:

Expected Outcomes:

• Enhancement of populations of local bay scallop, oyster, and clam populations through targeted planting at suitable sites
• Increased nutrient removal from water column
• Expansion of commercially important shellfish beds

Evaluation Technique:

• Post planting monitoring activities will be conducted to assess survival and estimate impacts on nutrient removal in the short and long term.

- **Coastal Plant Nursery**

  It is envisioned that the seed collection, propagation of the plants in the nursery will be continued on a long-term basis following the project end date. This will be done with the assistance of volunteers recruited throughout the course of this project in order to maintain the nursery and keep producing plant material for use in Southampton Town based projects, if even on a small scale should no subsequent funding be immediately available.

  Expected Outcomes:

  • Establishment of marsh habitat created using *Spartina alterniflora* plugs propagated from locally collected seed to ensure adaption to conditions at each site
  • Creation of intertidal habitat for waterfowl, shorebirds and other wildlife
  • Increased shoreline resiliency and filtration of nutrients from surface runoff

  Evaluation Techniques:

  • Success in propagation techniques via quantification of plants produced over project period
  • Documentation of evidence of fauna populations within the restoration sites

- **Eelgrass Restoration Activities**

  Pre-monitoring of potential planting areas will be conducted each summer prior to restoration activities in the fall. CCE has previously conducted eelgrass restoration

plantings in Southampton Town waters, and is also working on establishment of a sanctuary area and Western Shinnecock Bay, near the Tiana Bayside Facility. Restoration sites will be finalized upon start of project period and will be monitored in the spring following each planting to assess any mortality and report on restoration success. The sites established with the approval of the Trustees, are envisioned to be long term receiving areas that will continually receive plantings utilizing funding resources CCE is continually seeking in support of the Marine Meadows Program.
Eelgrass Restoration:

Expected Outcomes:

• Establishment of new eelgrass meadows as a result of adult shoot transplant
• Evidence of recruitment and expansion of meadow over project period and beyond
• Creation of habitat for recreational and commercially important finfish and shellfish

Evaluation Techniques:

• Post planting monitoring dives to assess survivability and recruitment
• Evaluation of seed dispersal and recruitment within designated restoration site

Project Budget

Project Expense	Requested	CCE Match
Personnel	$ 457,000	$ 310,375
Travel	$ 3,640	$ -
Equipment	$ 6,000	$ 50,000
Materials and Supplies	$ 38,000	$ 16,800
Contractual Services	$ -	$ -
Other Direct Costs	$ -	$ -
CCE Administrative Fee	$ 74,688	$ -
Total	$ 579,328	$ 377,175

Total Project Cost **$ 956,502**

Budget Justification

The multitude of species to be cultivated and propagated in support of water quality and habitat restoration goals calls for a wide scope of expertise, infrastructure and implementation of proven methodology. The budget reflects the personnel, equipment and material expenses needed to conduct this project. The proposed project represents an expansion of the regional work currently being done by CCE Marine Program to enhance the benefit to Southampton Town, and would continue to some degree should funding be decreased, but in order to expand to the capacity and operations of the Tiana Bayside Facility shellfish and plant nursery dedicated funds will be required. CCE Marine Program is continually seeking funding from various municipalities, agencies, foundations, and donors in order to continue, and expand operations at all of its locations and will continue to do so after the life of the current proposed project to ensure ample funds continue to be directed towards these efforts. The highest restoration success (and in turn water quality benefits) will be achieved when a long-term commitment is made

towards the expansion, maintenance and monitoring of restoration efforts. The expansion of Tiana Bayside Facility operations will help realize such success.

Key Project Personnel

Chris Pickerell is the Marine Program Director at Cornell Cooperative Extension of Suffolk County. Chris has worked for CCE for over 25 years as a Wetlands Restoration Specialist and has been the Marine Program Director for the past 6 years. He holds a B.S. in Biotechnology from Rochester Institute of Technology, and a M.S. from Cornell University in Plant and Soil Science. Chris has been involved in CCE's eelgrass restoration program since its inception and has developed several novel techniques for eelgrass and wetland restoration. He has authored numerous publications on these subjects and been invited to present his experience in eelgrass restoration to multiple organizations in the U.S. and Europe. He will provide planning and technical oversight for the project and assist with eelgrass planting in the field.

Kimberly Barbour is a Senior Resource Educator and serves as Marine Program Outreach Manager for Cornell Cooperative Extension of Suffolk County. She holds a B.S. from Marist College in Environmental Science with a Minor in Communications, and a M.P.S. in Environmental Management from SUNY Stony Brook. For the past 15 years Kimberly has worked in the public and non-profit sectors on environmental project management, program development, and design and delivery of outreach and fundraising campaigns. She oversees CCE's Back to the Bays Initiative and Marine Meadows Initiative, both designed to create engagement opportunities for the public to assist with CCE's numerous science-based restoration and research efforts. Kimberly will serve the role of Project Manager overseeing the administrative responsibilities of the grant, obtaining any needed permits and permissions for restoration activities, and managing public relations and community outreach efforts.

Dr. Stephen Tettelbach is a Shellfish Ecologist at Cornell Cooperative Extension of Suffolk County and Professor Emeritus of Biology at Long Island University, where he taught marine science and biology for 33 years. He received his B.S. in Biology from the University of Miami, M.S. in Fisheries Biology from the University of Washington, and Ph.D. in Ecology from the University of Connecticut. He has conducted field and laboratory research on bay scallops for over 40 years; has helped plan, implement and monitor Peconic bay scallop restoration efforts for over 30 years and serves as co-leader of the ongoing, 16-year project, "Restoration of Peconic Bay Scallop Populations and Fisheries", the largest and most successful of its kind in North America. He is a current member of the Peconic Estuary Program Bay Scallop Task Force, has served as an invited reviewer of the Nantucket Bay Scallop Management Plan, and is former President, Vice-President and Treasurer of the National Shellfisheries Association. He has given more than 70 presentations on bay scallops at local, regional and international conferences and published more than 20 peer-reviewed scientific papers on bay scallops.

Chris Smith is a Natural Resource Specialist at Cornell Cooperative Extension of Suffolk County. He has worked 41 years in the Peconic Bay system, focusing on bay scallop restoration. He received a BS in Marine Science from the University of West Florida and an MS in Marine Science from SUNY Stony Brook. He has been principal investigator for 16 years of the Suffolk

County sponsored Restoration of Peconic Bay Scallop Populations and Fisheries, a nationally recognized shellfish restoration program.

Stephen Schott serves as CCE Marine Program's Marine Botany Specialist. He has a B.S. in Botany and M.S. in Biology, specializing in marine botany and ecology, from the University of Rhode Island. He has worked for Cornell Cooperative Extension Marine Program since 2000, conducting eelgrass and wetland restoration and monitoring. Stephen has assisted in the development of several new eelgrass restoration techniques that have been adopted nationally and helped develop, and currently oversees, a long-term eelgrass monitoring program for the Peconic Estuary. Stephen will oversee all field-based operations affiliated with the coastal and marine plant restoration aspects of this project and be responsible for meeting the proposed habitat restoration goals with the support of his team of technicians and scientific divers.

Other personnel to be involved in this project include numerous CCE Aquaculture Team staff including an Algae Production Specialist, Aquaculture Specialists, and hatchery and field technicians; members of the CCE Habitat Restoration Team including field scientists, technicians and divers; and CCE Education and Outreach Team members including CCE's Marine Program Volunteer Coordinator and educators.

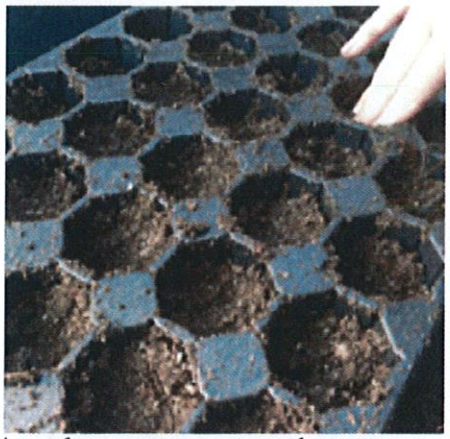
COASTAL PLANT RESTORATION

Smooth Cordgrass

Spartina alterniflora

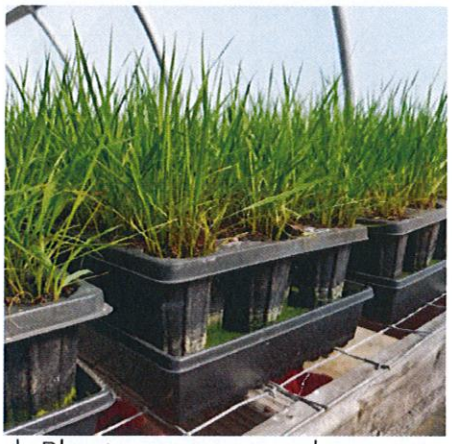
- ✓ Inundated by the tides, this species serves as a critical buffer between land and sea
- ✓ Helps absorb nutrients and pollutants from land-based runoff
- ✓ Important foraging and nesting habitat for our fish and waterfowl

a. Local seed is collected in the fall during a carefully monitored collection window



b. After winter stratification, a seed mix is prepared based on germination trials

c. Plug trays begin to germinate and root expansion takes place



d. Plant propagation begins once plugs become root bound

e. Each plug will be split and up-potted a total of 4 times, making up to 16 planting units

f. Plants will be transported from Tiana Bayside nursery to the restoration site and planted based on guidelines

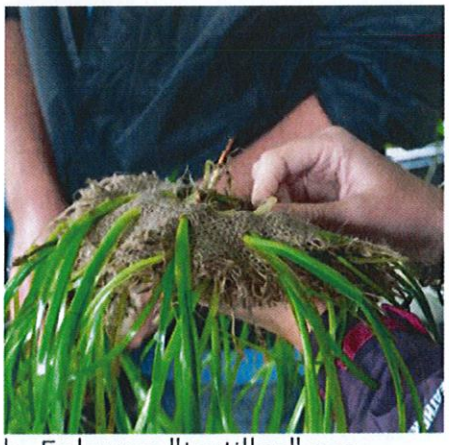
COASTAL PLANT RESTORATION

Eelgrass

Zostera marina

- Our local seagrass species that is critical nursery habitat as well as foraging grounds
- Important foraging and nesting habitat for our fish and waterfowl
- Helps protect shorelines from erosion, absorb nutrients

a. Marine Meadows Workshops engage the public in this work



b. Eelgrass "tortillas" are assembled by volunteers

c. New holding tanks at Tiana Bayside will help enhance restoration efforts

d. Tortillas are transported from Tiana Bayside to carefully selected restoration sites

e. CCE's divers hand plant each tortilla creating new eelgrass meadows

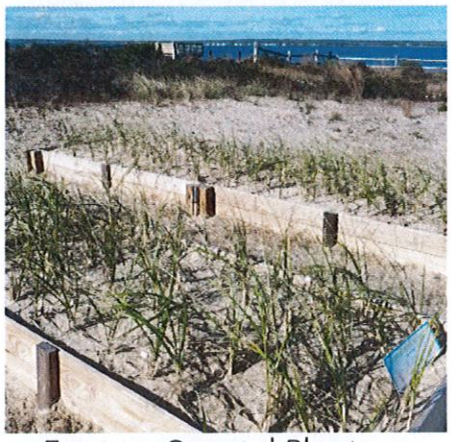
f. Eelgrass plantings are monitored for survival and species utilization, including bay scallop spat

COASTAL PLANT RESTORATION

Beach Grass

Ammophila breviligulata

- Dune-forming species, trapping and accumulating sand
- Critical for erosion protection during storms
- Its presence is required for many beach nesting birds



a. Existing Coastal Plant Nursery at Tiana Bayside Facility will be expanded

b. Culms are harvested from nursery and seperated for restoration planting

c. Individual culms being planted ~8" deep and 1' on center

d. Marked frames keep spacing; habitat team planting

e. With the help of snow fencing, individual shoots clone and spread rapidly

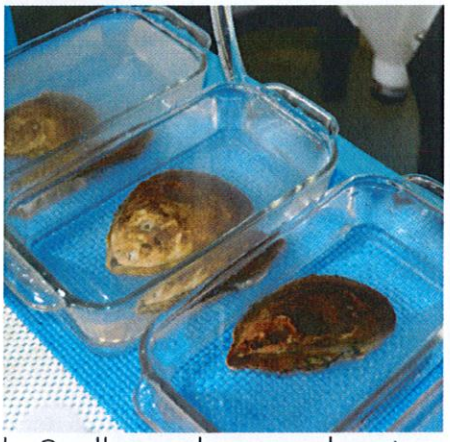
f. The Coastal Plant Nursery also serves as an important educational tool at the Tiana Bayside Facility

HATCHERY OPERATION

Algae Production + Shellfish Spawning

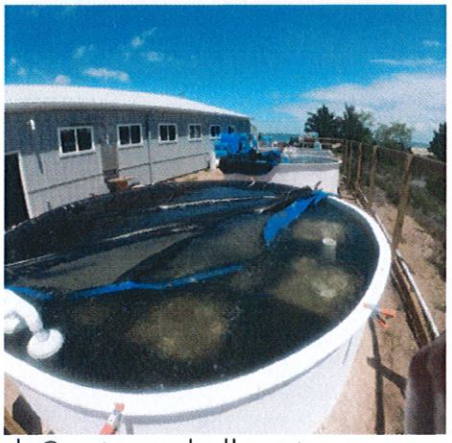
All shellfish produced for this project will begin at CCE's state-of-the-art Shellfish Hatchery in Southold. Algae production, spawning, and care of shellfish will be conducted at this site before animals are transported for grow out at the Tiana Bayside Facility Shellfish Nursery.

a. Algae is produced in order to feed shellfish in hatchery

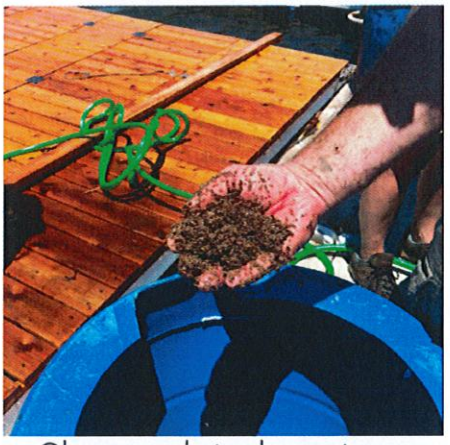


b. Scallops. clams, and oysters are spawned here

c. Shellfish are fed microalgae produced by CCE



d. Spat-on-shell oysters are produced by setting larvae on recycled shell in large holding tanks



e. Clams and single oysters are grown out in FLUPSYs until large enough for seeding in Town waters

f. Bay scallops are moved to nursery site for grow out and will be planted in Town waters

Cornell Cooperative Extension | Marine Program

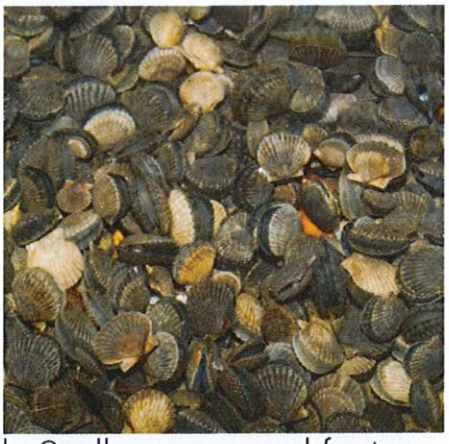
SHELLFISH RESTORATION

Bay Scallop Nursery

Argopectin irradians

- ✔ CCE has lead local bay scallop restoration efforts for over 15yrs.
- ✔ Bay scallops are economically important to the region
- ✔ Tiana Bayside Facility would be the first South Fork nursery site

a. Bay scallops are spawned in CCE's Hatchery



b. Scallops are cared for in a nursery setting to encourage growth and increase survival

c. A new nursery net system will be installed at Tiana Bayside

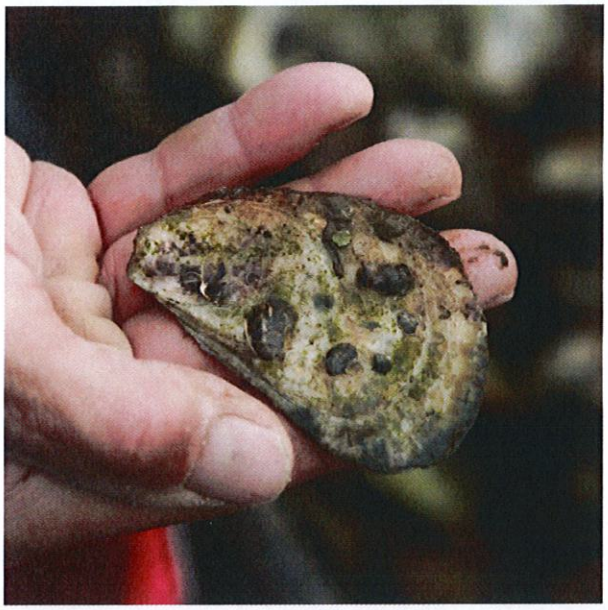
d. View of bay scallops, protected from predators, in lantern nets

e. Scallops are serviced using CCE staff and vessels

f. Bay scallops will be planted in Town waters once they reach 40+mm

Cornell Cooperative Extension | Marine Program

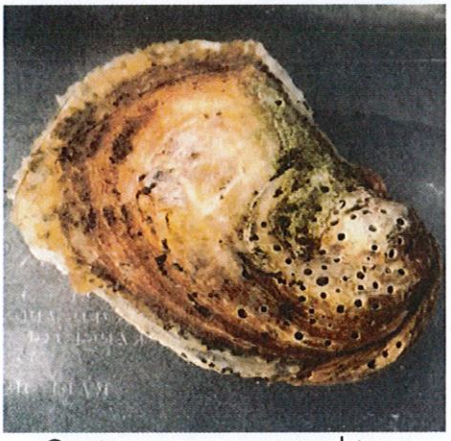
SHELLFISH RESTORATION



Oyster Spat-on-Shell

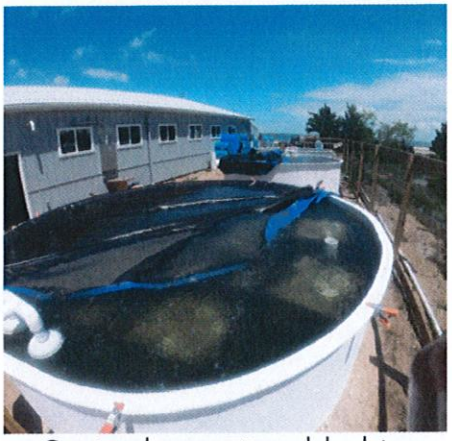
Crassostrea virginica

- Spat-on-shell oysters are used to form oyster reefs
- Oysters are effective filter feeders and improve water quality
- Oyster reefs also serve as important habitat



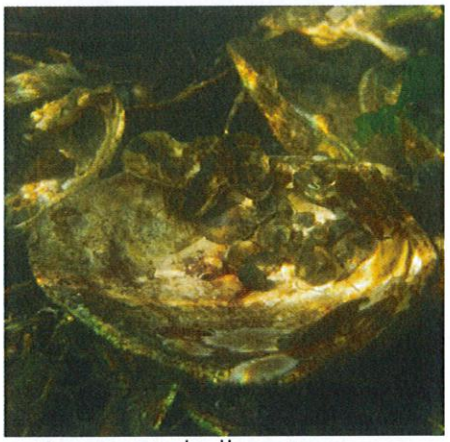
a. Oysters are spawned in CCE's hatchery

b. Recycled shell substrate is cleaned and prepared

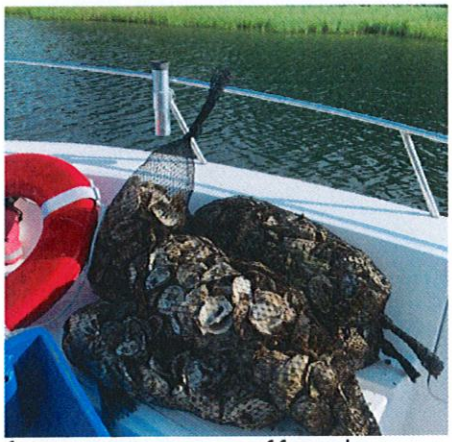


c. Oyster larvae is added to circulation tanks

d. Larvae sets on shell, becoming spat-on-shell



e. Spat-on-shell oysters continue to grow until ready to plant at suitable restoration site



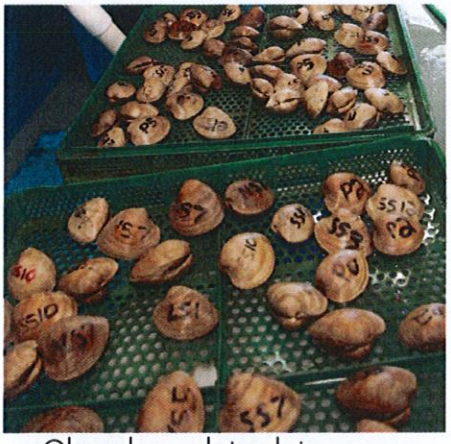
f. CCE Marine staff and volunteers empty bags of spat-on-shell to form new oyster reefs

SHELLFISH RESTORATION

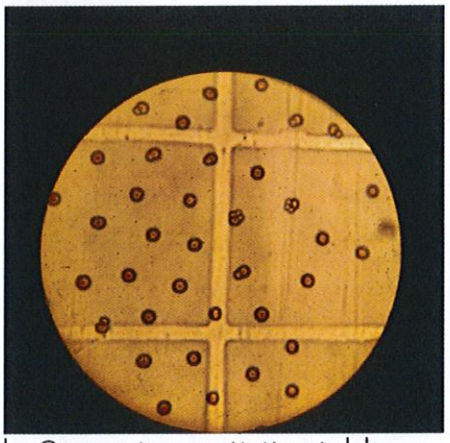
Hard Clam

Mercenaria mercenaria

- ✔ Clams are filter feeders and reduce nitrogen in surface waters
- ✔ Clams will be produced in CCE's Shellfish Hatchery
- ✔ FLUPSYs at Tiana Bayside will provide ideal grow out conditions



a. Clam broodstock is prepared for spawning

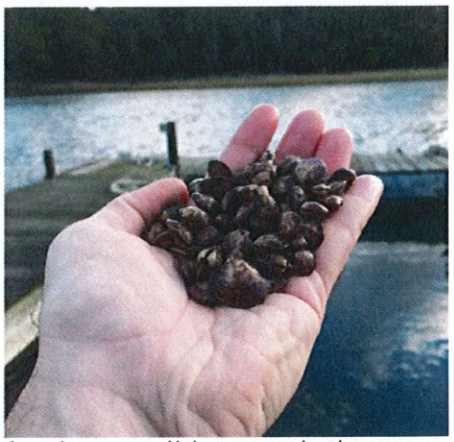


b. Spawning activity yields millions of clams each year

c. Clams are sorted, cleaned and fed in the hatchery

d. Once big enough clams will be deliver to Tiana Bayside shellfish nursery

e. Clams will be held in FLUPSYs on site, and cared for by staff + volunteers



f. Clams will be seeded in Town waters, utilizing volunteers when possible

Tiana Bayside Facility and Grounds:
Proposed Expansion Areas of Coastal Plant and Shellfish Nursery Operations