

Memorandum

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Subject **Town of Orleans, MA**
Water Quality and Wastewater Planning
Task 8 – Non-Traditional Technologies - Aquaculture/Shellfish Propagation
Deliverable 8.1.2.B.3 – Final Technical Memorandum on Population Survey of
Quahog Production on Town Cove

Project Number 60476644

From Thomas Parece, P.E., AECOM Project Manager

Date October 6, 2016

1. Background

In Town Cove and parts of Pleasant Bay, expansion of municipal quahog propagation is recommended. Quahogs have been grown successfully through the existing Town's propagation program, and there is suitable bottom in both Town Cove and Pleasant Bay for increased quahog planting. Determining current densities before additional quahogs are added to these water bodies is an important first step in evaluating survival, growth, and the impacts of additional quahogs on water quality. Once the baseline population is established, the specific quantities and sizes of additional quahogs will be recommended as part of an expanded quahog propagation program for identified areas in Town Cove and Pleasant Bay. While purchasing quahogs that are already large enough to be field-planted (approximately 18 to 25 mm) is the current practice in Orleans, the possibility of starting from smaller seed will also be explored.

Once current densities in these areas has been established, appropriate numbers of seed quahogs can be planted and water quality can be monitored and correlated to numbers of new quahogs added to these systems.

2. Introduction

Appendix A includes a list of the areas that have been historically planted by quahogs in Orleans. Town Cove in the Nauset Harbor System is the focus of the first phase of the quahog propagation demonstration. Figure 1 shows preferred areas for baseline quahog population assessments in Town Cove that were identified by the Orleans Department of Natural Resources (DNR). In order of preference for conducting a baseline survey for the purpose of enhanced propagation, the areas outlined in red and orange are first priority, with targeted locations within the blue and purple areas to be surveyed as funding becomes available.

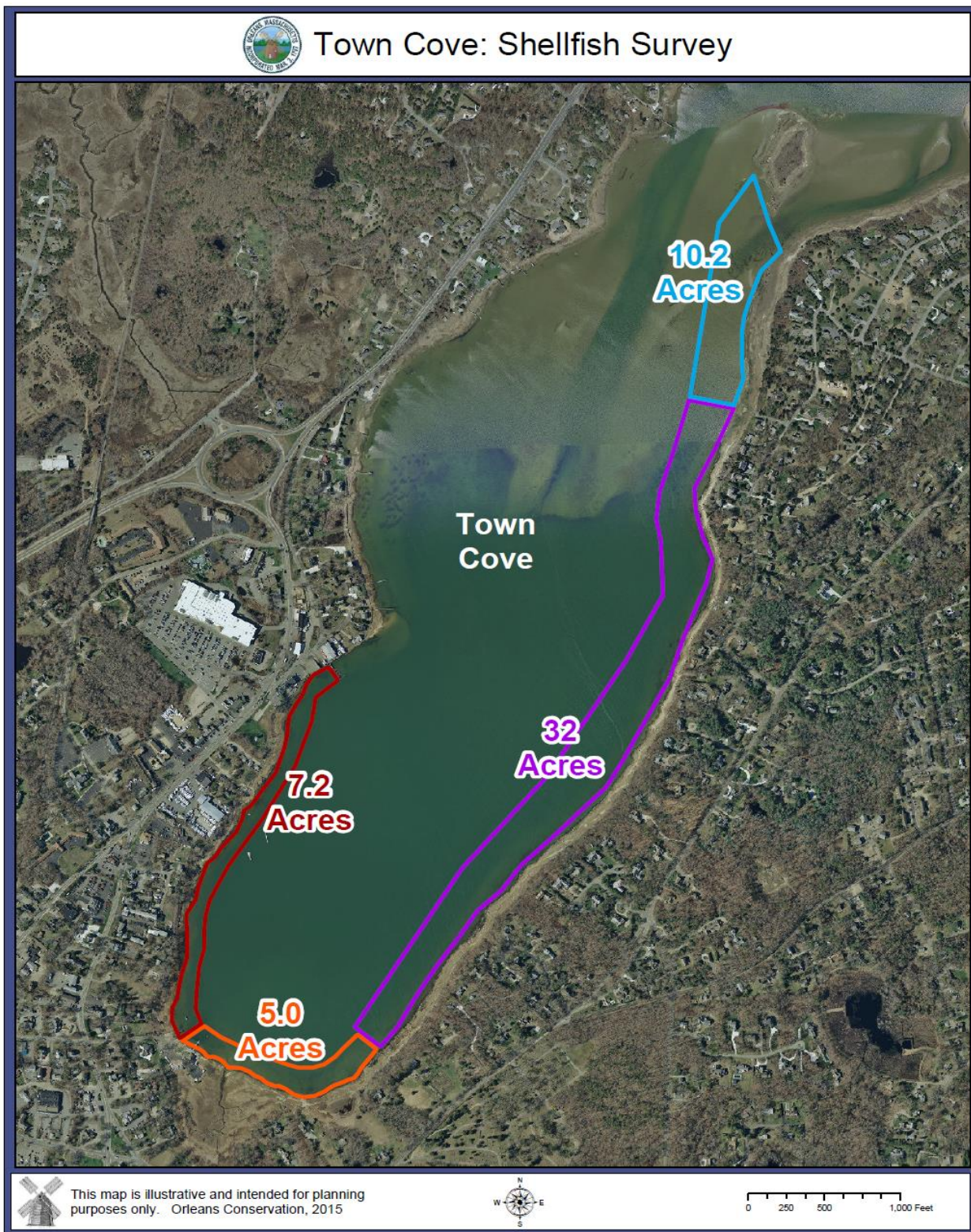


Figure 1. Town of Orleans Preferred Shellfish Survey Areas

3. Scope of Work

The following tasks are the specific scope for the Request for Proposals (RFP) for Quahog Survey and Population Enhancement in Town Cove:

Task 1: Establish a baseline population count in areas historically planted by the Town to quantify the success of future propagation efforts

As part of the response to this RFP, respondents will prepare and describe the precise methodology for the quahog population study including an estimate of the bottom area that needs to be surveyed and survey method and parameters. Respondents are asked to provide costs per acre surveyed. Sample areas should be surveyed for all megafaunal organisms in order to provide a standing stock assessment of quahogs as well as a summary of biological diversity of megafauna in the area. Prior to initiating this assessment, the work plan must be approved by AECOM. Quahog population counts will then be used as the baseline density on which to base the numerical goals and evaluations of future propagation efforts.

The specific areas in Town Cove that will be surveyed will be determined in close coordination with the Town Department of Natural Resources staff. For planning purposes, the goal is to survey at least ten acres, beginning with the area near the Orleans Yacht Club. The total acreage that will be surveyed will be determined by the budget available and the final cost per acre for the survey.

Task 2: Quantify suitable areas that should be planted with additional quahogs under the municipal propagation program

As part of the response to this RFP, respondents will prepare and describe the methodology and decision making parameters used to determine the area suitable for enhanced quahog propagation.

Task 3: Propose a method for monitoring and evaluating survival and population dynamics

As part of the response to this RFP, respondents will describe a methodology for quantifying survival of quahogs that are planted as part of enhanced municipal propagation for water quality improvement.

Task 4: Reporting

A draft and final report detailing survey findings will be required. This document must include:

- Description of survey methodology;
- Maps showing areas surveyed with station locations marked;
- Findings of survey including Standing Stock Assessment and benthic conditions;
- Identify areas where additional quahogs can be propagated; and
- Method for quantifying survival of planted quahogs.

4. Timeline and Deliverables

A. Phase I: September 1, 2016 – October 20, 2016

Within this timeframe, the timing and activities to accomplish the various steps of the first phase of this demonstration should proceed as follows:

- Finalize RFP to perform this Scope of Work

B. Phase II: October 30, 2016 – June 30, 2017

Within this timeframe, the timing and activities to accomplish the various steps of the first phase of this demonstration should proceed as follows:

- Circulate RFP to perform this Scope of Work;
- Execute Subcontract Agreement;
- Conduct population survey; and
- Submit draft and final Technical Memorandum on Quahog Survey and Population Enhancement in Town Cove.

Appendix A**Areas that have been Historically Planted by Quahogs in Orleans**

The following is a record of the propagation program for the Orleans Shellfish Department:

1996: Spring - Purchased 1 million 2.5 mm mercernaria mercenaria. Placed in 22 floating trays in Lonnie's Pond. Fall - Field planted 40,000 18-20mm scallops at the mouth of Namequoit River. In October, transplanted 1 million from floating trays and placed them in 25 bottom boxes (10 @ OYC, 15 @ Kent's Point conservation area/Kent's Bay)

1997: Spring/Summer - Purchased 110,000 2.5 mm merc merc. Placed in 10 floating trays in Lonnie's Pond. Set a string of 10 spat collecting bags just north of Namequoit Point. As of Sept. 15, evidence of three sets (pencil eraser size to dime/nickel size).

Mid-September - Of 10 boxes located at Y.Club, growth was excellent. Cleaned 8, removed field plantable stock from 2 (2, 5-gallon buckets). Some steamers (1/2-3/4 inch were also naturally set). Planted these (average size 8-14 mm) from Nauset Marine dock to south east end of family area at OYC in approx. 3-4 ft. of water. Photo of seed in folder.

Also planted 1, 5-gallon bucket of 3rd year stock from 3 bottom boxes located at Asa's Landing (see photo in prop folder). Mercs ranged in size from 8-20 or 25mm. Planted in T.Cove, southern shoreline @ 4 ft.

October 8, 1997: Received 100,000 12-20mm mercs from Mook Hatchery located in Osterville. All stock was direct planted in the Pleasant Bay estuary. Refer to the map sheet for exact locations.

October 21, 1997: Received 180,000 15-25mm bay scallops from Mook Sea Farms Maine Hatchery. All stock was planted in the Pleasant Bay estuary. Refer to photos for visual. Refer to map sheet for planting locations.

October 5, 1999: Received approximately 325,000 quahogs (initially from Barnstable County Grant Program) from Eastham's upweller units located at Salt Pond. Transferred 275,000 animals at 3-8 mm to 5 bottom boxes located at OYC for over-wintering. Remaining 50,000 animals at 8-12mm were field planted within the OYC family area.

November 1999. received 550,000 bay scallops at 25 mm. Planted into little p.bay. approx. 50,000 kept in lantern nets in big bay.

November 1999. received 20,000 25 mm bay scallops. Contained animals in rack system. Scallops received through grant program with Barnstable county.

December 1999. received 50,000 35mm bay scallops from Mook. Animals direct planted into Town Cove.

August 20, 2000. 34,000 25-30mm animals direct planted on S, W, and N shores of Town Cove. 34,000 25-30 mm animals planted under 2-50'x15' raceways @ Asa's. Also planted under raceways were 450,000 3-6 mm animals.

September 12, 2000. Field planted approx. 40,000 20-25 mm animals from 1 out of the 5 boxes located at OYC (estimated @ 55,000 per box – loss of approx. 15,000). Animals planted at end of Tonset along approximately 400 feet of shoreline (either side of base of stairs).

September 14, 2000. Field planted approx. 125,000 22-25 mm animals from 2 bottom boxes located at OYC. Animals planted at sandbar outside and east of Rachel's Cove and at bar directly across from Snow Shore.

September 16, 2000. Field planted approx. 125,000 22-25 mm animals from last two bottom boxes located at OYC. 55k planted from Goose to NMI. 70k from Snow's to Rocky Point east of Asa's.

November 9, 2000. Received 200k bay scallops from Mook. 100k @ 15-20mm, 100k @ 25-40mm. Animals direct planted in Little P. Bay in eel grass in shallows in center of Bay.

March, 2002. Planted 300,000 quahogs from Greater New Bedford Marine Farms at town grant at Asa's landing.

November, 2002. Planted 66,000 quahogs from Cape Cod Oyster @ 20-22 mm. Planted approx. 25,000 in family area at OYC, balance was planted on town grant off Asa's landing.

November, 2002. Planted 150,000 quahogs from Greater New Bedford Marine Farms @ 14-18 mm in Nauset estuary at the following locations: north shore of Cove from OYC to Goose, Tonset to Robert's Cove (west shore), Seacall to launch ramp (in family area).

November, 2002. Planted 30,000 quahogs from CC Oyster @ 25 mm + in Town Cove in OYC family area and from launch ramp to Cove Motel.

June, 2003. Planted 388,000 12-15 mm quahogs on grant at Asa's.

June, 2003. Planted 126,000 18 – 22 mm quahogs from Rocky Point west through OYC family area and then in front of Cove Rd. landing towards the Cove Motel.

June, 2003. Planted 336,620 15 – 18 mm quahogs @ following: M-House (NME to Barley Neck, South edge of M-house to head of River), Kent's Point to mouth of Lonnie's, Mayflower Point to Higgins Way.

November ,2003. Planted 740,000 14-22 mm quahogs at mouth of Lonnie's (northern edge) and within Lonnie's from ramp to Herrick's property and along bar at head of Lonnie's, then from mouth of Lonnie's south along western edge of River to shore across from Jackknife Point, then at cove on north side of Namequoit Point out onto the point itself.

November, 2003. Planted 110,000 in Meetinghouse Pond from town dock along south edge to head of M-House River. Particular concentration on bar located within the Pond on the south edge of the Pond.

June 24, 2004. Planted 100 bushels of contaminated quahogs in family area in Town Cove.

November 2, 2004. Planted 200,000 15-25 mm bay scallops in Little Pleasant Bay, north-west of Hog Island on eel-grass beds.

June 22, 2006. Contaminated relay. 200 bushels from Taunton River (Ray Silva, harvester) planted in family area in front of OYC.

June/July 2007. 800,000 oysters in to cages at Mill Pond and Meetinghouse Pond. Approx. 1 million remote set oysters at Mill Pond.

October, 2007. 350,000 quahogs @20 mm (180,000 in Nauset, 170,000 in Pleasant Bay at approx. 20,000 per individual area listed) planted amongst the following locations. Nauset - Hopkins (east and west sides), between Snow Shore and Tonset, Robert's Cove, north side of Mill Pond in to Little Stumpy, then in family area at Mill Pond. Pleasant Bay – M-House to right of landing to Calkins' house, south side of M-House, western shore of The River (along Mayflower Pt. shoreline), Portanimitcut to East Egg shoreline, Narrows to past Dickson's, Quanset from QHC dock to Little Quanset and on Little Quanset flat, Quanset from ramp to Winslow dock, and Lonnie's north-east and western shorelines, also on bar at head of Lonnie's River.

2008 – No seed available and then funding removed by TA for budget shortfall.

September, 2009. 300k quahogs @ 15-20 mm planted on south and north edges of Town Cove and on south shore east of Hopkins Island. 340k quahogs @ 12-15 mm planted Tonset to Snow Shore, southeast edge of Priscilla Bar, Robert's Cove (both sides), Family Area in Mill Pond and northwest edge of Mill Pond from Ocean Harbor to Grandview. 260 k planted in P. Bay – M-House (east side and west side by mouth), River from Lucy's crotch to mouth of river, Frostfish Cove mouth, south of Kent's Point, Mayflower Point, Jackknife Point, Sargent's Pt, East Egg to Narrows, Big Bay at Narrows (west side).

September 30, 2010 – 220,000 11-16mm quahogs planted in Nauset: Priscilla bar, Priscilla beach, between Tonset and Snow Shore, Hopkins Island to sw of Asa's, Gooe around cove to Seacrest.

October 8, 2010 – 40,000 11-16 mm quahogs Quanset Pond and shoreline east and west. 70,000 Narrows west towards Quanset. 15,000 East Egg. 10,000 Mayflower Point. 25,000 Old Field Point (southern edge). 30,000 southern shore of Kent's Point. 50,000 from Nauset Marine East along eastern and southern shoreline to mouth of River.

September 16, 2011 – 300,000 oyster seed (12-15 mm) placed in cages in Mill Pond for over-wintering.

September 30, 2011 – 150,000 quahogs (15-20mm) direct planted into Nauset estuary as follows: west end from Cove Motel to Sea Call Farm, east of Asa's to Hopkins and east of Hopkins, Pride's Path and east to Snow Point.

October 13, 2011 – 100,000 quahogs (12-20mm) planted south side of Tern island flat, west of Priscilla to Mill Race and Robert's Cove shore and outer flat.

September 1, 2012 – Planted 300,000 oyster seed from cages in Mill Pond. Animals were 2-3" in length. Planted southern edge of Town Cove.

September 21, 2012 – Planted 430,000 quahogs (15-20 mm) in following areas: 60,000 – Robert's Cove (west side), 40,000 Robert's Cove (east side, Doane to Priscilla), 100,000 – south edge of Priscilla bar and along flat inside beach, 20,000 – Snow Shore to Tonset, 20,000 on flat opposite Tonset, 30,000 – flat north of Freeman Ln, 40,000 – flat on backside of Hopkins, 120,000 – Point of Rocks to Driftwood in Town Cove.

October 9, 2012 – Planted 145,000 quahogs (15-20 mm) in following areas: 35,000 in Meetinghouse (either side of Barley Neck landing), 50,000 south of Kent's Point, 10,000 south of Mayflower Point, 50,000 from north edge of Namequoit around to south edge.

October 22, 2013 – 230,000 quahogs (15-20 mm) planted from Seacall through OYC area then from ramp at Cove Rd. to Goose landing then Asa's.

October 24, 2013 – 350,000 quahogs (15-20 mm) – South side of Cove, outside Rachel's and west, backside of Hopkins, Snow Shore, Priscilla landing to Doane and Robert's Cove.

October 17, 2014 -350,000 quahogs (15-20mm) – Goose dock through family area up to Asa's Landing.

October 29, 2014 – 125,000 quahogs (15-20mm)- Priscilla Landing Bar to Doane 100,000 quahogs (15-20mm) Meetinghouse River around Kent's Point towards Lonnie's Pond.