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Padanaram Harbor Management Plan

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PADANARAM HARBOR MANAGEMENT PLAN

MAY 2019



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EXECUTIVE SUMMARY

The Padanaram Harbor Management Plan was developed over a two-year period, from 2017–2019, by a broad spectrum of Dartmouth governmental officials, citizens of the Town, regional and state agency staff, and representatives of non-governmental organizations. There was significant public involvement through open meetings and an online survey. During the entire process, drafts of elements of the Plan were posted on the website of the Planning Board as they became available. The work was supported in consultation with staff of the Urban Harbors Institute from the University of Massachusetts Boston. Funding was provided through a grant from the Massachusetts Seaport Economic Council with a local match.

Early on in the process, public input identified fourteen topic areas in need of management changes or updating in order to better utilize and enjoy the important resources Padanaram Harbor provides. These topic areas include:

- Harbor cooperation/coordination
- Water quality
- Land use
- Dredging and navigation
- Commercial uses of the Harbor
- Recreational uses of the Harbor
- Commercial and recreational fishing
- Living marine resources
- Public access
- Docks and piers
- Flooding and climate change
- Emergency response
- Transportation
- Historic and cultural resources

Over the course of the planning process, specific issues within each topic area were identified and background material collected. After analysis by a 27-member Harbor Advisory Committee (and several sub-sets functioning as topic-oriented working groups), a series of broad goals, more focused objectives, and specific recommendations were drafted which offer options for better management by the Town of Dartmouth. While it is hoped that the goals and objectives will be utilized as policies in making future town decisions, the specific recommendations will be implemented through normal town processes, such as Town Meeting, Select Board decisions, administrative decisions within Departments, or capital expenditures.

The planning process was begun under the direction of John Hansen, former Town Planner. His input helped shape the entire process and his assistance is gratefully acknowledged.

PART ONE: PLANNING PROCESS AND GOALS, OBJECTIVES, AND RECOMMENDATIONS

INTRODUCTION

Section 1.1: The Purpose, Scope, and Authority of the Padanaram Harbor Management Plan

The Padanaram Harbor Management Plan (Harbor Plan) is designed to provide the Town of Dartmouth and other stakeholders with the information and resources to better understand, protect, and enhance the economic, cultural, and natural resources of the waters of the Harbor and its surrounding lands. It is designed to provide a harbor-related component as a complement or supplement to the Dartmouth Master Plan and the Open Space and Recreation Plan.

The Harbor Plan offers a series of short-term and long-term goals, objectives, and recommendations that the Town can implement through changes to by-laws and regulations, administrative actions and/or capital expenditures for improved and sustainable management. Any implementation of the recommendations included herein will be made through the normal governmental processes of the Town—acceptance or adoption of the Harbor Plan by the Town will not bring any automatic implementation of the recommendations.

In doing this, the Harbor Plan offers:

- A summary of available information about the Harbor and its past,
- A review of current management issues and concerns, and
- A series of general policies/goals, focused objectives, and specific recommendations for consideration and implementation by the Town through its normal governmental processes.



The Harbor Plan addresses fourteen topic areas, as identified through a range of interviews, public meetings, and an online survey, including:

- **Cooperation and coordination** between existing entities with management authority within the Harbor and its surrounding lands
- **Water quality** within the Harbor itself and landside sources of pollution
- **Land use and open space** surrounding the Harbor
- **Dredging and navigation including sedimentation patterns** within the Harbor
- **Commercial uses** of the Harbor and protection of working waterfronts as well as water-dependent and waterfront-enhanced businesses.
- **Recreational uses** of the Harbor and surrounding lands
- **Fishing, shellfishing, and aquaculture** within the harbor's waters
- **Living marine resources and landside living resources** dependent on the Harbor and its tributaries
- **Public access** to the waters of the Harbor and surrounding lands
- **Docks and piers**, both commercial and residential
- **Impacts from flooding from storm events and sea level rise** on lands and development surrounding the Harbor
- **Response to emergencies** on the harbor's waters and in surrounding lands
- **Transportation-related issues** associated with the Harbor and its surrounding lands
- **Historic and cultural contexts** related to use and development of the Harbor

The Harbor Plan should be reviewed and updated as necessary every five to ten years by the Town. It will be critical to define an entity within the Town to monitor implementation of the Harbor Plan and its recommendations with annual reports on the status of implementation to be provided to Town officials.

Development of the Harbor Plan was overseen by the Planning Department of the Town of Dartmouth with the considerable input from the Harbor Plan Advisory Committee and a series of active sub-committees.

Funding for the preparation of the Harbor Plan was provided by the Massachusetts Seaport Economic Council with a local match. The Town of Dartmouth Waterways Management Commission provided limited funding as a start-up for the planning process.

WHAT'S IN A NAME?

Over the years, there have been differing names to identify the body of water under study in this Harbor Plan.

- On the Des Barres chart of 1781, it was called the Apponagansett River.
- 20th century hydrographic surveys have referred to the area north of the causeway as the Apponagansett River and the area south of the causeway as Apponagansett Bay
- Contemporary USGS topographical maps, NOAA Nautical Charts and the Town of Dartmouth MapGeo system label the area south of the causeway as Apponagansett Bay with no separate designation for the area north of the causeway.

A “bay”, using the dictionary definition, is a geographic area where a body of water is bounded on three sides by land. A “harbor”, on the other hand, is generally defined by use as a place where vessels can anchor or moor and take refuge from the elements. The waterbody at hand, therefore, meets both definitions.

The most common current phrasing uses Padanaram Harbor—noting the use rather than the geographic form—more often than Apponagansett Bay. As this seems most familiar to the general public—those who will be making decisions regarding the waterbody, we have chosen to use Padanaram Harbor for the purposes of this document. Further, we will refer to the area to the north of the causeway as the northern segment of the Harbor and that south of the causeway as the southern segment of the Harbor.



THE PLANNING AREA

As indicated in the Introduction, the Padanaram Harbor Management Plan was prepared as a tool for the Town of Dartmouth to improve its management of the water and coastal resources related to the Harbor. Therefore, the geographic focus of the Harbor Plan is those areas which have direct impacts on the uses and resources of the Harbor—and where decisions by the Town can affect these uses and resources. (The uses and resources will be further discussed later in this document.) Most decisions of this type will have an impact at or near the resource or use, and the effects will be concentrated within the waters of the Harbor or along the shoreline. It is this area where there is a clear relationship between landside and water uses, and between these uses and harbor resources, that has been identified as the “planning area” for the purposes of this Harbor Plan.

The principal exception is for water quality-related issues. In this case, a sizable portion of the watershed leading to the Harbor lies outside the planning area. This does not mean that water quality issues of concern arising within the watershed but outside the planning area will not be addressed, it merely recognizes that the watershed extends a significant distance away from the Harbor, with a portion lying outside the jurisdiction of the Town. As a result, for water quality issues, the planning area will consist of the entire watershed draining to the Harbor.

Additionally, there is one limited area north of Russells Mills Road along the Apponagansett Brook that is subject to storm flooding and falls outside the planning area. As with the water quality issues described above, all areas adjacent to the Harbor subject to storm flooding or projected sea level rise will be addressed as part of the Harbor Plan.

The planning area boundary is solely for use in the development of the Harbor Plan. It does not establish any additional jurisdictional boundaries or modify any existing regulatory programs (*e.g.*, zoning).

The Padanaram Harbor planning area as shown on Figure 1, is generally bounded:

- on the east by Elm Street to Fremont Street to Pleasant Street to Harbor Street to Middle Street to Bush Street to Elm Street to Russells Mills Road;
- on the north by Russells Mills Road to Bakerville Road;
- on the west along Bakerville Road to Rock O Dundee Road; and
- on the south along Rock O Dundee Road to Smith Neck Road, north to Shore Acres Road, east along Shore Acres Road to a line across the water extending from the stone breakwater at the mouth of the Harbor.

CRITERIA FOR THE BOUNDARY DELINEATION

The criteria utilized in setting the boundaries for the planning area include:

- Conform with easily recognized cultural features, primarily Town roads and the breakwater at the mouth of the Harbor. These were selected over other, less recognizable delineations, such as contour lines or extent of flood plain delineations, because they are more clearly recognized and easily located.
- Recognize all water and land uses directly affecting the Harbor.



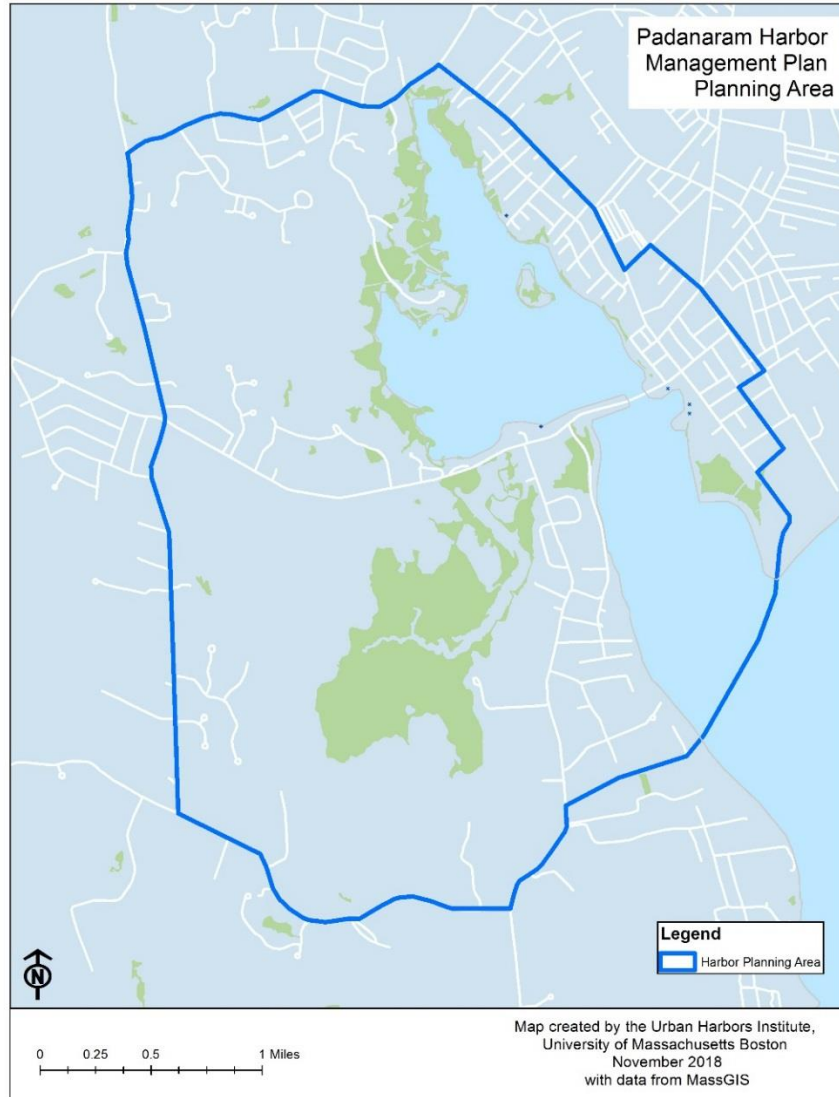


Figure 1: Padanaram Harbor Planning Area

THE PLANNING PROCESS

One of the principal goals in the development of the Harbor Plan has been to base it on community concerns and community solutions. Consequently, there has been considerable public involvement.

As a prelude to the initiation of the harbor planning process, the Dartmouth Waterways Management Commission funded a limited project to identify the broad categories of interest related to the Harbor. This effort involved interviews with more than 30 members of the community; members of town boards, commissions, and committees; staff of Town departments, and regional environmental groups. A list of these interviews may be found in Appendix A. These interviews led to the identification of 14 topic areas (some overlapping) to be addressed in the Harbor Plan:

- | | |
|--|-------------------------------------|
| 1. Cooperation and Coordination among Existing Management Entities | 8. Living Marine Resources |
| 2. Water Quality | 9. Public Access |
| 3. Land Use | 10. Docks and Piers |
| 4. Dredging and Navigation | 11. Flooding and Climate Change |
| 5. Commercial Uses of the Harbor | 12. Emergency Response |
| 6. Recreational Uses of the Harbor | 13. Transportation |
| 7. Commercial and Recreational Fishing | 14. Historic and Cultural Resources |

An initial step in the planning process was to establish a Harbor Management Plan Advisory Committee (Advisory Committee)—the role of which was to establish policies and priorities for the Harbor Plan and to review iterations of the Harbor Plan as they became available. The members were invited to participate by the Town Planner at the time, John Hansen, who chaired the Advisory Committee. Members included a wide array of local and regional interests. Over the period of the planning process, some members left the Advisory Committee and others joined. As of October 2018, the Advisory Committee members were:

- Chair—Vacant. Formerly John Hansen
- Dartmouth Select Board—John Haran
- Dartmouth Town Administrator—Shawn MacInness
- Dartmouth Office of Community Development/Grants—Deborah Wender
- Dartmouth Conservation Commission—Patricia Sweriduk
- Dartmouth Planning Board—John Sousa
- Dartmouth Department of Public Works—David Hickox
- Dartmouth Waterways Management Commission—Geoff Marshall
- Dartmouth Harbormaster/Shellfish Constable—Steve Melo
- Dartmouth Parks and Recreation Board—James Bosworth
- Dartmouth Historic Commission—Vacant. Contact Judy Lund, Chair
- Dartmouth District 1 Fire Department—Brad Ellis, Chief
- Dartmouth Pathways Committee—Alan Heureux, Chair
- Dartmouth Finance Committee—
- Robert Gauvin
- Massachusetts Coastal Zone Management Office—David Janik
- Massachusetts Division of Marine Fisheries—Eileen Feeney
- Padanaram Business Association—Will Milbury
- Marine Business—Geoff Marshall, Marshall Marine
- Marine Business—Stuart MacGregor, Concordia Company (also liaison to the Community Preservation Committee)
- Marine Business—Dave Nolan, South Wharf Yacht Yard and Marina
- Aquaculture Business—Steve Caravana
- Dartmouth Natural Resources Trust—Dexter Meade
- UMass Dartmouth Public Policy Center—Mike McCarthy
- Public at Large—Brian O’Hare
- Public at Large—Andrea Langhauser
- Public at Large—Benjamin Baker

- Public at Large—Deborah Baker

The planning process was introduced to the public in two ways, a public meeting, attended by more than 40 individuals (some did not sign in) on October 24, 2017 and an online survey with more than 250 respondents which was available beginning on October 17, 2017 and continuing until mid-November of that year. In each, participants were asked to describe issues and potential solutions related to the 14 topic areas. In the online survey, participants were also asked to identify their priorities for each of the topic areas. In both of these processes, members of the public were offered the opportunity to provide contact information to a mailing list, compiled by the consultant team from the Urban Harbors Institute, for announcements of document availability or public meetings.

The Advisory Committee met as a full body on the following dates:

- September 26, 2017
- February 1, 2018
- May 30, 2018
- November 26, 2018

At each meeting the consulting team received comments on iterations of the Harbor Plan.

Prior to meetings of the full Advisory Committee, working groups consisting of self-selected members of the Advisory Committee met to address each of the topic areas and review preliminary drafts of the planning document. More than 30 working group meetings were held during 2018.

The web page of the Dartmouth Planning Board hosted material related to the planning process for public review. This included a list of members of the Advisory Committee and each new iteration of segments of the drafts of the planning document.

A draft of the full version of the proposed Harbor Plan was discussed at a public meeting in February of 2019. Issues and suggestions raised there were considered for review by the Advisory Committee and a final draft of the complete Harbor Plan was submitted for review and acceptance by the Dartmouth Planning Board in February of 2019. Subsequently, the final Harbor Plan was approved by the Dartmouth Select Board in May of 2019.

Implementation of the various recommendations contained within the final Harbor Plan will be done through the normal processes of Town government with all appropriate review and comment by the public. The Advisory Committee has provided input about the priority recommendations and timeline to guide implementation (See Appendix B).

Section 1.2: Goals, Objectives, and Recommendations

The goals, objectives, and recommendations for the Padanaram Harbor Management Plan were developed in consultation with the Harbor Management Plan Advisory Committee, topic-specific working groups, and other stakeholders, and reflect the input gathered through the public process. More information on each topic is available in Section Two of this document.

HARBOR COOPERATION/COORDINATION

More than a dozen municipal entities have interests in and/or responsibility for management of Padanaram Harbor and its surrounding area, covering such aspects as natural resource management, preservation of cultural resources, and public health and safety. In addition to municipal entities, several state and federal entities regulate, permit, manage, or are otherwise engaged in activity in the planning area; and multiple non-government organizations also have a variety of interests in the Harbor.

Presently, there is no single entity charged with oversight of all harbor activities. Further, there is no entity charged with facilitating coordination among and between the various groups. Consequently, each group tends to focus solely on its areas of responsibility with limited sharing of planning intent, data, or management decisions. In most cases this does not result in any harm, but there have been instances where conflicts could have been better managed with improved coordination and communication at the early stages.

Improved coordination among these groups can also ensure that the review and update of other planning documents (*e.g.*, the Town Master Plan, Open Space and Recreation Plan, and the Town Hazard Mitigation Plan) reflect the relevant and shared goals and implementation mechanisms of the Harbor Plan (or at least do not conflict).

Coordination will also be needed in order to implement the recommendations of and make updates to the Harbor Plan. More specifically, the Harbor Plan presents two levels of recommendations for consideration by the Town:

1. Broad goals and objectives for management of resources and activities.
2. Specific, detailed recommendations for actions to implement the goals of the Harbor Plan. These may require changes to by-laws through Town Meeting; may be accomplished through administrative changes by various Boards, Commissions, or Committees as a by-product of how they regularly conduct their business; or may require financial expenditures for further studies or planning or for construction or additional maintenance of structures. These recommendations are generally offered in priority categories with proposed timelines (See Appendix B).

With regard to implementation, acceptance of the Harbor Plan by the Select Board notes an acceptance of the broad goals and objectives identified in item number one, above. The implementation recommendations, however, will require further action via the normal processes undertaken by the Town for changes to by-laws and regulations, administrative changes, or expenditure of funds.

It will be important to identify a means to regularly review the recommendations provided in the Harbor Plan to ensure that they are being actively considered for implementation or, if not accepted, intentionally rejected/not acted upon. The entity responsible for Harbor Plan implementation (see recommendations three through five, below) should provide the Select Board and/or the Planning Board with an annual report on the status and disposition of each recommendation.

As conditions within, and uses of, the Harbor change over time, the Harbor Plan will also need to evolve. A periodic review of the Harbor Plan and the establishment of a mechanism for updates will allow for both major and minor changes to be made.

Issues

- There is a need for improved coordination and cooperation of existing entities in order to:
 - ensure future linkages between the Harbor Plan and other town planning efforts, and
 - improve management of new or on-going harbor-related projects and activities.
- There is a need for a mechanism to implement the Harbor Plan.
- The Harbor Plan will require periodic updates in order to ensure that it remains current and meaningful over time.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Maximize cooperation/coordination/communication among and between managing entities when making decisions regarding management of Padanaram Harbor

Objective I: Establish a mechanism to foster and facilitate coordination/cooperation/communication.

Recommendation 1: Formally designate a lead entity within town government charged with coordination and communication between parties interested in activities within, surrounding, or affecting Padanaram Harbor.

This may involve re-programing tasks for an existing entity or establishment of a new element of town government with staffing support through an existing department. This entity would act as a facilitator to coordinate the various groups with interest in the Harbor, but would not function as an overall manager of harbor activities. Coordination could include periodic meetings with all appropriate department heads.

Funding:

- Through existing Departmental budgets or an addition to existing staff if a new position is established

Potential Implementing Entities:

- Dartmouth Select Board

Objective II: Ensure that town planning efforts complement and/or incorporate the goals and objectives of the Padanaram Harbor Management Plan.

Recommendation 2: Include the goals and objectives of the Final Padanaram Harbor Management Plan as part of updates of all major planning efforts within the Town, including updates to the Master Plan, the Open Space and Recreation Plan, and the Community Preservation Committee annual needs assessment.

The Harbor Plan may be a stand-alone document or may be incorporated into the Master Plan as an additional chapter. In either case, the accepted goals should become the policy of the Town of Dartmouth and therefore consistent with existing and future, updated Master Plans, Open Space and Recreation Plans, and other similar planning documents.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Select Board
- Dartmouth Planning Board and Department
- Dartmouth Conservation Commission
- Dartmouth Board of Parks and Recreation and Department

- Dartmouth Community Preservation Committee
- Other Boards, Commissions and Committees charged with plan preparation

Goal II: Maximize implementation of the Padanaram Harbor Management Plan

Objective I: Ensure that the various elements of the Padanaram Harbor Management Plan are carefully considered as to their priorities and timelines and that a mechanism is established to monitor their implementation as appropriate.

Recommendation 3: Establish a Harbor Plan Implementation Committee or Commission charged with advocating for implementation (or other resolution) of the various elements of the Padanaram Harbor Management Plan.

It will be important to ensure that the various recommendations contained in the Harbor Plan be carefully considered for implementation. Some recommendations will be implemented in the short term while others may take longer due to factors such as limited financial availability or the need for careful design of proposed construction. However, each recommendation should be considered for implementation as conditions and/or priorities may evolve. The Harbor Plan Implementation Committee or Commission should be charged with regularly reviewing and reporting the status of each of the recommendations. Such a Committee/Commission could either report directly to the Select Board or to the Planning Department which would, in turn, report to the Select Board.

Funding:

- As part of planning efforts

Potential Implementing Entities:

- Harbor Plan Implementation Committee/Commission
- Dartmouth Select Board
- Dartmouth Planning Board

Recommendation 4: The Harbor Management Plan Implementation Committee or Commission should prepare an annual report to the Select Board and/or the Planning Board on the implementation or other disposition of each of the recommendations in the Padanaram Harbor Management Plan.

An annual review and report on the implementation of the Harbor Plan will ensure that the goals, objectives, and recommendations contained herein will be considered on a regular basis for their implementation status or evaluation as to whether they remain meaningful. An annual review should include a recalculated time-line and assessment of potential funding if necessary. The annual summary report of the Harbor Plan Implementation Committee/Commission should be included in the Annual Town Report.

Funding:

- Existing Departmental staff support as necessary

Potential Implementing Entities:

- Harbor Plan Implementation Committee or Commission

Recommendation 5: Encourage, as appropriate, the formation of a non-governmental organization whereby the public-at-large can advocate for issues related to the Harbor and its management.

It is of great value to the implementation of the Harbor Plan for the general public to have a means to better understand and make their voices known on issues related to the Harbor and its management. Neighboring communities, and the Buzzards Bay complex as a whole, have citizen advocacy groups, while Dartmouth does not. Such a group could focus on either the Harbor specifically or the overall waterways of the Town.

Funding:

- None required from the Town

Potential Implementing Entities:

- Citizens of the Town of Dartmouth

WATER QUALITY

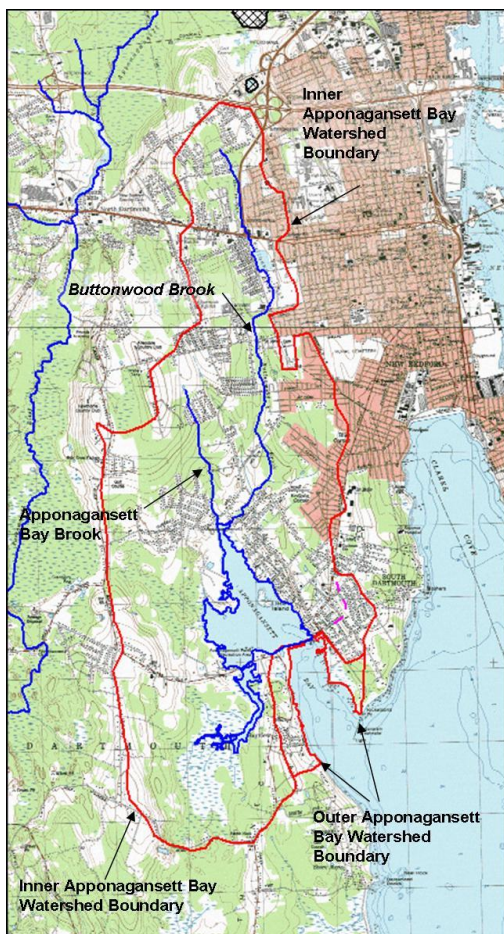


Figure 2: The watershed area draining to Padanaram Harbor (Map from the Massachusetts Estuary Project report for Dartmouth)

The overriding management issue related to water quality is controlling nitrogen levels within the Harbor system—with wastewater and stormwater being among the largest contributors, and atmospheric deposition also playing a role.

Information from the Massachusetts Estuary Project and the Buzzards Bay National Estuary Program indicate that the outflow from Buttonwood Brook is the most significant source of nitrogen, though the sources of nitrogen to Buttonwood Brook are not entirely clear and will probably require additional, focused monitoring to both quantify any reduction of inputs and to identify sources.

The southern portion of the Harbor is at the tipping point of eutrophication, while the northern portion of the Harbor is somewhat over this tipping point and already experiences eutrophication. Better management of wastewater and stormwater runoff might, if not reverse the situation, at least help bring it closer to equilibrium.

Use of fertilizers has been identified as a possible significant source of nitrogen. The use and amounts of fertilizer application, whether by homeowners or agricultural activities, are individual decisions. The 2007 Town of Dartmouth Master Plan advocated for educational materials and programs to inform townspeople of the potential impacts of fertilizer usage and best management practices but there has not been a broad effort to develop and disseminate such

materials.

The Town has established controls of runoff—which also impacts water clarity—through Planning Board reviews and Conservation Commission regulatory decisions, and the DPW has upgraded stormwater outfalls. Lacking monitoring of these efforts, however, it is currently impossible to quantify any lessening of nutrient loading. Additionally, with more intense precipitation events expected as a result of climate change, the Town will need to ensure that runoff control measures are adequate moving forward. Further, if it turns out that runoff is a significant source of nitrogen to Buttonwood Brook, it could be difficult to reduce the input given the highly-developed nature of the Buttonwood Brook sub-watershed.

In addition to runoff and fertilizer, potential remains for nutrient loading from residual septic plumes on properties sewered within the past twenty years. Depending on the location of the abandoned septic system, it may take decades for the nutrients to move through the system to the Harbor or to a tributary to the Harbor. This is likely to be a

modest percentage of total nitrogen loading to the Harbor, but it should not be entirely discounted.¹

Other potential undocumented sources of nitrogen in the watershed could include plumes from past dumping or landfills, illicit discharges, and sewer-stormwater cross connections.

Finally, the Estuary Project report projects potential additional input from future development. It will be important for the Town to ensure that such additional development utilizes best management practices to avoid adding to the nitrogen-loading concerns.

In addition to nitrogen, another water quality concern is that of pathogens. These disease-causing bacteria or viruses generally reach the Harbor from runoff containing animal waste during storm events or from bird colonies utilizing the Harbor as habitat. Presence of bacteria at elevated levels results in closures of shellfish areas and limitations on water contact activities (*e.g.*, beach closures at Apponagansett Park).

Issues

- Nitrogen is entering the water from a variety of sources, including septic stems, road runoff, and groundwater.
- Data about the specific sources of nitrogen and the amount of nitrogen entering the Harbor are lacking.
- Research about the impacts of water quality improvement projects is not being conducted.
- Climate change will affect water quality and should be considered in future upgrades to the stormwater and sewer systems.
- Pathogens in the water can result in shellfish and beach closures.
- Turbidity (lack of water clarity) can impact marine life and habitats in the Harbor.
- Water quality improvement efforts are not being done in a coordinated fashion.



¹ Costa, Joseph, Buzzards Bay National Estuary Program, 2018, pers. comm.

GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: To preserve, protect, maintain, and improve the quality of the waters of Padanaram Harbor

Objective I: Identify the specific sources and quantities of nutrient inputs into Padanaram Harbor and identify measures to successfully limit these inputs.

Recommendation 1: Identify and remediate the sources of nutrient inputs into the Harbor.

The principal nutrients of concern within Padanaram Harbor are nitrogen-based compounds. The most common sources for these compounds are from human and animal waste, fertilizers, and atmospheric deposition. The Advisory Committee recommended a target for nutrient level thresholds in the Harbor to be that which could sustain the growth of eelgrass in the northern portion of the Harbor and could allow existing areas of eelgrass in the southern portion of the Harbor to expand and flourish.

To reach these goals, it will be necessary to clearly identify—and remediate—the sources of nutrient inputs into the Harbor. Prior investigations have suggested that major sources of inputs come from the two brooks leading into the northern portion of the Harbor: Buttonwood Brook and Apponagansett Bay Brook (sometimes called Vincent Brook), particularly the former. It will be critical to carefully monitor the waters of these two streams to locate places where nutrients enter the system and identify the specific sources. Preliminary discussions suggest that monitoring 20–30 specific locations along Buttonwood Brook (above and below discharge pipes) would help focus further monitoring efforts and assist in finding sources. Estimates for cost would be in the \$10,000–\$12,000 range for this effort but costs might be reduced by volunteers conducting the sampling (perhaps with training through the Buzzards Bay Coalition program) and testing through the Buzzards Bay National Estuary Program. These potential sources for cost reduction should be investigated further. Additionally, the Massachusetts Department of Environmental Protection (MassDEP) and/or the U.S. Environmental Protection Agency (U.S. EPA) might have programs to assist in the effort. Monitoring at selected sites should also include testing for bacterial loading to be able to recognize direct discharges of sewage.

It will be important to work with the appropriate entities in the City of New Bedford regarding inputs from Buttonwood Brook as the headwaters and some potential sources in nitrogen input are located outside the boundaries of the Town of Dartmouth.

Funding:

- A funding source for such a monitoring program will need to be identified as it would fall outside normal departmental budgets.

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Dartmouth Department of Public Works
- Buzzards Bay National Estuary Program
- Buzzards Bay Coalition

- Buzzards Bay Action Committee

***Recommendation 2:** Determine whether removal or minimization of nutrient inputs from Buttonwood and/or Apponagansett Bay Brooks will be sufficient to meet the thresholds established by the Advisory Committee.*

It is currently unclear whether removing or minimizing the level of nutrients entering the Harbor from these two brooks will be sufficient to reach the thresholds recommended by the Advisory Committee. Additional calculations and/or modeling will be necessary to resolve this question. It may be that inputs from stormwater, particularly from the developed east side of the Harbor, and overuse of fertilizers—both domestic and agricultural—throughout the watershed may have measurable impacts.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Dartmouth Department of Public Works
- Buzzards Bay National Estuary Program
- Buzzards Bay Coalition

***Recommendation 3:** Identify and quantify other sources of nutrients to the Harbor that can be managed at the local or regional level. Disseminate the results to resource managers and the public-at-large.*

Other sources of nutrient input to the Harbor have been suggested and amounts estimated. These include fertilizers from lawn or agricultural over-use carried in either stormwater runoff or groundwater infiltration, or runoff from storm events carrying animal waste, or from atmospheric deposition. While nutrients carried through the atmosphere can originate from distant sources and must be managed at the federal and state level, local treatment of stormwater can help reduce the influx of atmospheric deposition into the Harbor. Various modeling systems are available, generally based on land use, to estimate inputs from these sources. These models should be utilized to estimate the level of inputs from these non-point sources to see if their management would allow the Town to reach the recommended thresholds.

Nutrient loading from current and past septic systems are likely an additional source of contamination. While these are likely a modest percentage of total nitrogen to the Harbor, they should not be discounted.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Dartmouth Department of Public Works
- Buzzards Bay National Estuary Program
- Buzzards Bay Coalition

Recommendation 4: Work with the Massachusetts Department of Environmental Protection to complete a current Total Maximum Daily Load report for Padanaram Harbor.

The Total Maximum Daily Load (TMDL) report assesses the amounts of nitrogen, and the sources, that the Harbor can receive in order to meet a desired water quality. The Massachusetts Estuaries Project prepared a draft background report, “Linked Watershed-Embayment Model to Determine Critical Nitrogen Thresholds for the Apponagansett Bay Estuary, Dartmouth, MA” (June, 2015) but this report has never been finalized. The report concluded that, given a water quality target in the northern portion of the Harbor of 0.50 ppm (based on preventing low oxygen conditions), no action is needed by the Town to reduce nitrogen. However, if a lower water quality target is selected to create conditions that could support potential eelgrass restoration, a TMDL is required and possible management actions need to be defined to meet that TMDL. This will lead to a TMDL prepared by the Department of Environmental Protection, Bureau of Water Resources (MADEP) and submitted to the U.S. EPA for approval. The approval of a TMDL will make the Town eligible to apply for funding for remedial actions. A new TMDL analysis should reflect existing sewerage, current land use and loadings, and total nitrogen targets to meet the water quality and habitat goals recommended by Advisory Committee, particularly the creation of conditions that could support restoration of eelgrass north of the causeway.

Funding:

- Departmental budgets
- MA Department of Environmental Protection

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Dartmouth Director of Public Health
- DEP Bureau of Water Resources staff
- Buzzards Bay National Estuary Program staff
- Buzzards Bay Coalition

Objective II: Identify the specific sources and quantities of inputs of pathogens into Padanaram Harbor and identify measures to successfully limit these inputs.

Recommendation 5: Establish and implement a monitoring program to clearly identify specific sources and quantities of pathogens reaching the waters of the Harbor. Disseminate the results of this monitoring program to resource managers and the public-at-large.

For appropriate management efforts to be implemented, it is critical to clearly define the sources and levels of pathogen inputs. Any such monitoring must recognize that these inputs tend to be pulsed, meaning they result from short-term runoff following storm events.

Funding:

- Grant sources such as the MA DEP and/or the U.S. EPA

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Department of Public Works
- Buzzards Bay National Estuary Program
- Buzzards Bay Coalition

***Recommendation 6:** Clearly identify those locations within the Harbor with the greatest potential for impacts to humans stemming from shellfish consumption or water contact activities, and provide focused monitoring there.*

There are certain areas within the Harbor with potential for significant pathogenic effects on humans—particularly those areas where shellfish are harvested for human consumption or where water contact activities take place. These areas should be clearly identified and monitored to guard against human health impacts.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Board of Health
- Dartmouth Parks and Recreation Department
- Dartmouth Shellfish Constables
- MA Division of Marine Fisheries

Objective III: Identify and implement means to reduce resuspension of bottom sediments that reduce water clarity.

***Recommendation 7:** Identify man-made activities that suspend sediments that may reduce water clarity, and investigate options for resolution of issues defined during this process.*

Establishment or improved health of eelgrass requires light to reach the plants. Turbidity (cloudiness or “murkiness” of the water) is, in part, due to suspension of bottom sediments. The northern portion of the Harbor has sizable areas of very fine sediments which, when suspended, may remain in the water column for extended periods of time. Such resuspension may result from natural conditions such as storms (something that cannot be managed) or from human activities such as boat propellers running at high speeds in shallow waters. Identifying human activities involved in suspension of sediments and estimating their impacts will provide the opportunity for management decisions.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- Dartmouth Department of Public Works
- Buzzards Bay National Estuary Program

- Buzzards Bay Coalition

Objective IV: Identify and quantify any obstacles to flushing of waters from Padanaram Harbor and, if any are found to exist, work to minimize or remove their impacts.

***Recommendation 8:** Accurately evaluate the impacts, if any, on flushing of the northern portion of the Harbor by the causeway.*

It has long been alleged that the presence of the causeway/bridge bisecting the Harbor may have significant impacts on the flushing of contaminants from the northern portion of the Harbor. To date, there has not been a thorough evaluation of this issue, although there have been estimates offered as parts of other studies.

Funding:

- A funding source for such a monitoring program will need to be identified as it would fall outside normal departmental budgets

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Department of Public Works

Objective V: Identify and implement management options to improve water quality in Padanaram Harbor and its tributaries.

***Recommendation 9:** Once specific sources for nutrients and pathogens to the Harbor have been identified and quantified, develop and implement management options to improve water quality in the Harbor and its tributaries.*

Once causes/sources of impairments are identified, it will be necessary to develop management options to remove or mitigate them. Such management options may involve:

- Engineering solutions,
- Changes in human behavior either through regulatory solutions (e.g., by-laws, regulations) or voluntary changes (e.g., public outreach, education),
- Funding decisions requiring cost/effect evaluations, and
- Ability to maintain management options over time and changing conditions (e.g., additional development, deteriorating infrastructure, changes in economic conditions, etc.)

Funding:

- Dependent on option to be implemented

Potential Implementing Entities:

- Town Meeting
- Dartmouth Select Board
- Dartmouth Environmental Affairs Department
- Dartmouth Planning Board and Department
- Dartmouth Department of Public Works

- Buzzards Bay National Estuary Program
- Buzzards Bay Coalition
- Others depending on the management option to be addressed

Objective VI: Establish programs to monitor the impacts of management options to improve water quality in Padanaram Harbor and its tributaries to ensure effectiveness of such management options.

***Recommendation 10:** Establish monitoring programs to ensure that the management options being implemented are working to meet the thresholds established for water quality goals.*

Once the various management options are being implemented, monitoring programs should follow any changes in water quality to determine effectiveness of the options and to recommend adaptations of those options if they are found to be unsuccessful, not cost-effective, or no longer needed. There are already water quality monitoring programs in effect within the Harbor. These should be continued and expanded as necessary to ensure that management options are working to meet established goals.

Funding:

- Additional funding may be necessary to continue or expand monitoring efforts

Potential Implementing Entities:

- Dartmouth Environmental Affairs Coordinator
- Dartmouth Department of Public Works
- Buzzards Bay National Estuary Program
- Buzzards Bay Coalition

***Recommendation 11:** Establish a Water Quality Committee or Commission within the Town administrative structure to monitor and coordinate activities related to improvement in water quality within the Harbor.*

The goal of the Committee/Commission will be to develop a priority action list to address the reduction of nutrient and pathogenic inputs into the Harbor.

Water quality improvement efforts will require a balance of various areas of expertise and experience, including:

- Technical aspects of water quality management
- Engineering capacity to improve water quality
- Management options
- Financial sources and budgetary oversight
- Public-at-large representation of Dartmouth residents
- Water quality impacts on natural resources and their management

A Committee or Commission within the Town administrative structure should be established to help coordinate the efforts of various entities working on water quality issues and to monitor the efforts and results of such efforts. Such a Committee or

Commission should be appointed by the Select Board with representation for appropriate interests.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Appointments to the Committee or Commission by the Select Board with representation on the Committee or Commission from appropriate interest groups

LAND USE

Land use in and around the Harbor planning area can have significant impacts on water quality, storm protection, and recreational and commercial opportunities.

As discussed in greater detail in the section on water quality, development and, in particular, impervious surfaces within the watershed, can lead to road runoff and pollution of the Harbor and the tributaries and waterways that drain to the Harbor. Further, certain land uses may impact groundwater resources through activities such as wastewater discharges.

Land use also plays an important role in reducing storm impacts. Wetlands act like sponges, helping to reduce storm surge and dissipate waves, and also take up and sequester contaminants. Pervious surfaces facilitate the penetration of precipitation into groundwater, preventing it from causing runoff and flooding.

Open space is not only important to natural resource protection and mitigation of storm impacts, it also provides opportunities for recreation, such as hiking, picnicking and nature viewing, and commerce, such as agriculture. Additional commerce is supported by land uses such as those in the Maritime Industrial District. Striking a balance between the types of land uses can be a challenge, but it is important when considering economic development, natural resource protection, recreation, and climate change preparedness.

Issues

- Efforts to strategically acquire properties for open space preservation, natural resource conservation, climate change mitigation and adaptation, and other purposes needs to be continued.
- Current zoning regulations may limit the potential water-dependent uses along the Harbor.
- Future development and population changes have the potential to impact natural resources as well as housing prices and other aspects of the Town.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Ensure that future development balances the needs of a growing population with the need to preserve open space and natural resources in and around the Harbor

Objective I: Promote the positive aspects of open space protection through public education and collaborative efforts on property acquisitions.

Recommendation 1: Continue to educate the public about the importance of open space and natural resource preservation through promotion of protected land, particularly those parcels available to the public for recreational purposes.

The Town should continue to promote its existing Open Space and Protected Lands Maps as a public educational tool and ensure appropriate educational signage is present at all town-conserved properties to promote public awareness.

Funding:

- Town budget
- Community Preservation Fund

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Department of Parks and Recreation
- Dartmouth Planning Department
- Dartmouth Natural Resources Trust

Recommendation 2: Continue to collaborate with key organizations, including the Dartmouth Natural Resources Trust, to identify, fundraise, and acquire strategic conservation properties.

Town entities and non-governmental entities, such as the Dartmouth Natural Resources Trust (DNRT) and the Buzzards Bay Coalition, provide vital conservation work for land acquisition, protection, and management and should continue to collaborate for the benefit of the public and the environment. In determining priority parcels to acquire for conservation, the entities involved should include acquisition of flood-prone properties with open space value as well as properties identified as important for sea level rise and salt marsh migration to upland areas. The Massachusetts Office of Coastal Zone Management (MCZM) is creating a marsh migration Geographic Information System (GIS) tool that will be available in 2019. Federal Emergency Management Agency (FEMA) grants are also available to assist with the acquisition of such properties.

Funding:

- Town budget
- Dartmouth Community Preservation Fund
- Fundraising

- FEMA mitigation grant programs: Flood Mitigation Assistance (FMA), the Hazard Mitigation Grant Program (HMGP), and the Pre-Disaster Mitigation (PDM) competitive grant programs

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Department of Parks and Recreation
- Dartmouth Planning Department
- Dartmouth Natural Resources Trust

Recommendation 3: *Continue to implement the recommendations contained within the most recent versions of the Town Open Space and Recreation Plan and the Dartmouth Master Plan.*

The Town of Dartmouth Open Space and Recreation Plan (current version is 2015–2022) is an important resource which presents measures that will help the Town protect, preserve, and increase its open space and recreation assets and resources. The Dartmouth Master Plan (current version is 2007) is another importance resource which provides a community-wide assessment of current conditions and a blueprint for the future so that the community can guide future growth and development in a manner that is consistent with the community’s values and goals. The Town should continue its efforts to implement these plans’ recommendations.

Funding:

- Town budget

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Department of Parks and Recreation
- Dartmouth Planning Department

Recommendation 4: *Support the acquisition of the Webb property on Bakerville Road for preservation purposes.*

The Webb property, with an address at 205-227 Bakerville Road, runs between Bakerville Road and the marsh abutting Salt Creek. Its acquisition would complete protection of the southern portion of the Creek, important for water quality enhancement and wildlife habitat. Its acquisition is a conservation project in process and funding is being sought. As proposed, the property would initially be acquired by the Buzzards Bay Coalition and then sold to the DNRT. The two houses on the property will be resold and the remaining 73 acres will be preserved from future development. Additional funding through the Town would help make this acquisition happen.

Funding:

- As available from Town resources
- Grants and donations

Potential Implementing Entities:

- Dartmouth Natural Resources Trust

- Buzzards Bay Coalition
- Dartmouth Conservation Commission
- Dartmouth Community Preservation Program

***Recommendation 5:** Support acquisition and/or land use restrictions on major parcels within the watershed of the Harbor, especially those in close proximity to the harbor's shoreline.*

Preservation of open space, either through acquisition, establishment of conservation restrictions/purchase of development rights, or other management techniques is significant in protecting water quality within the Harbor. Where there are sizable parcels within the watershed, and especially near the shoreline of the Harbor, efforts should be made to protect them as open space.

Funding

- As available from Town resources
- Grants and donations

Potential Implementing Entities:

- Dartmouth Natural Resources Trust
- Buzzards Bay Coalition
- Dartmouth Conservation Commission
- Dartmouth Community Preservation Program

Objective II: Ensure zoning by-laws are enforced and zoning districts, including uses on the water, are adequate to meet current needs and to support future expansion of marine-related businesses, while maintaining natural resources and water quality.

***Recommendation 6:** In consultation with marine-related business owners and harbor users, analyze the adequacy of current zoning districts with regard to business expansion and uses on the water.*

The Town should discuss future opportunities for marine-related business expansion, assess the strengths and limitations of the current zoning districts for this purpose, and pursue changes to the zoning districts as needed—taking into consideration impacts to adjacent property owners. Likewise, the Town should assess the current and anticipated uses on the watershed, determine whether current designated zoning districts are adequate to meet those needs, and adjust these districts accordingly. This should include a review of the need for any changes in the Maritime Industrial District.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Planning Department
- Marine-related business owners
- Dartmouth Harbormaster

***Recommendation 7:** Continue to enforce existing zoning by-laws requiring the use of semi-permeable pavement on all lot coverage exceeding the 70% lot coverage allowed in Village Business Districts (Section 371-15 Dartmouth’s Zoning By-law) and restricting lot coverage to 50% in the General Residence District (Section 375-10 of Dartmouth’s Zoning By-law); encourage adherence to stricter standards, such as permeable pavement or another type of cover that allows infiltration; and explore opportunities to create mandatory stricter standards for new development and significant expansion of existing projects.*

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Building Department

Objective III: Plan for future land use and development impacts to natural resources in and around the Harbor, including those from state initiatives, such as the South Coast Rail Project and the regulation of short-term rental properties.

***Recommendation 8:** Conduct a land use analysis of projected impacts, including increased population and housing pressure, in the Padanaram Harbor watershed as a result of the South Coast Rail Project, regulation of short-term rental properties, and other state initiatives.*

The Town should stay informed about state action on these and other initiatives and proactively plan for and address the anticipated impacts to the Harbor and harbor resources.

Funding:

- No additional funding is needed to implement this recommendation. The Town Budget is a potential source of funding if the services of a consultant are required.

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Conservation Commission

Objective IV: Assess potential build-out in the Harbor planning area and watershed to evaluate impacts on the Harbor.

***Recommendation 9:** Use data from the existing town-wide build-out study conducted in 2016 to create customized maps and analyses for the Harbor planning area and watershed and update the build-out on a regular basis in response to development or protection of open space.*

The Town conducted a town-wide build-out study in 2016. The results of this study should be selectively narrowed to focus only on the Harbor planning area, with associated mapping products created. These selected data will enable a more detailed

analysis and understanding of build-out impacts on the Harbor. Further, the build-out scenario(s) should be updated on a regular basis to reflect changes in land use over time.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Conservation Commission

DREDGING AND NAVIGATION

Padanaram Harbor has water depths ranging from one foot to 24 feet, with some areas of the Harbor completely dry at low tide. Dredging can negatively impact the environment, is often very expensive, and requires a lengthy permitting process. At the same time, stakeholders advocate that it could enhance navigation in the Harbor and reduce safety hazards related to shallow water depths.

Stakeholders have identified a variety of locations where there is an interest in dredging, including: the New Bedford Yacht Club Basin, the main Apponagansett Bay channel, the northern portion of the Harbor, various sandbars throughout the Harbor, and the ramp area at Arthur Dias Landing.

If any or all of the specified locales are dredged, the Harbor could experience an increase in available space for moorings, changes in water circulation patterns, an increase in vessel use, positive or negative impacts to water quality and natural resources, and enhanced economic opportunities due to visits from larger boats.

Issues

- The shallow areas within the Harbor may inconvenience or create safety concerns for boaters, reduce the potential for recreational use (*e.g.*, boating, kayaking) and boat storage (because the water is not deep enough to store and access the boat), and create access issues (*e.g.*, shallow areas near the ramps at Arthur Dias Landing).
- The Harbor may be experiencing sedimentation, possibly as a result of storm drains, runoff from roads and yards, and brooks connected to the Harbor, which could be causing an increase in shallow water areas. This problem could be exacerbated by the impacts of climate change through more intense precipitation events.
- Scouring is occurring underneath the Padanaram Bridge (the bridge). The scouring helps to keep the channel clear, but it is uncertain at this point whether the scouring could also undercut the bridge support and causeway structures.
- The lengthy and costly permitting process poses challenges for completing dredging projects.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Maintain waterways in Padanaram Harbor in a safe and navigable state for all users

Objective I: Promote safe navigation in Padanaram Harbor.

Recommendation 1: Establish a dredging maintenance program for Padanaram Harbor.

This program will determine which portions of the waterway are in need of maintenance dredging and which are in need of improvement dredging, and whether these potential locations for dredging are long- or short-term priorities. It will also identify research projects, cost estimates, and potential regional collaborations, and consider local beach maintenance opportunities as part of dredging projects.

Funding:

- No additional funding is needed to implement this recommendation. Funds will be needed to dredge.

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- U.S. Coast Guard
- Massachusetts Office of Coastal Zone Management
- Massachusetts Department of Conservation and Recreation

Recommendation 2: Seek funding to support the dredging program.

The high cost of dredging, including the environmental tests required for permitting, can pose challenges for completing projects. Efforts should be made to seek grants, establish revenue streams, and seek additional sources of funding. As part of this effort, consideration should be given to regional collaborations that could reduce the costs associated with mobilizing dredge equipment.

Funding:

- Massachusetts Seaport Economic Council
- Massachusetts Department of Conservation and Recreation
- Dartmouth Department of Public Works

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

Objective II: Determine the cause(s) of sedimentation and shallow waters in areas of Padanaram Harbor where possible, and rectify where feasible.

***Recommendation 3:** Conduct studies to determine the cause(s) of sedimentation and shallow waters in the Harbor, and how to address the shallow areas.*

Possible causes of shallow waters and sedimentation include: street runoff, harbor circulation patterns, climate change, and storm drains. If the causes can be determined, seek funding to remedy sedimentation issues.

Funding:

- Federal funding sources, as available
- MA Office of Coastal Zone Management grants (*e.g.*, Coastal Pollution Remediation grant program for stormwater carrying sediment)

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- U.S. Geological Survey

COMMERCIAL USES OF THE HARBOR

Commercial uses on and along the waterfront cater heavily to the local and regional recreational boating community, offering services such as vessel brokerage and sales, storage and repair, mooring service and inspection, and boat building. In addition to those water-dependent businesses with a physical presence along the shore, additional businesses such as canvas installers and marine electronic technicians will send people to the Harbor to work on specific vessels as needed.

These water-dependent activities benefit directly from the Harbor, while additional businesses—especially those in Padanaram Village—likely derive benefits from their proximity to the water—both because it attracts potential customers from the boating community and because it contributes to the scenic quality and character of the Village.

To date, however, the economic impact of the Harbor has never been quantified, creating uncertainty about the true financial benefits that the Harbor contributes to the local and regional economies. This information could be very useful as the Town decides how to invest in the Harbor moving forward—and especially as it plans for the impacts of climate change.

Additionally, the benefits associated with commercial uses of the Harbor are offset to some extent by the fact that buildings and operations can create physical and visual barriers to the waterfront and watersheet as well as contribute to the degradation of water quality.

(Commercial fishing information is included the section on commercial and recreational fishing.)

Issues

- Maintaining commercial uses of the Harbor is necessary for economic and cultural reasons, and zoning and other regulatory means should support these uses.
- Private businesses along the water should do more to allow/encourage public access.
- Commercial uses of the Harbor may have negative environmental impacts such as creating impervious surfaces and increasing water pollution.
- There is a need to balance commercial uses with public uses such as moorings.
- Climate change impacts such as sea level rise and more intense storms may impact commercial infrastructure and activities in the Harbor.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Encourage commercial uses in the Harbor while minimizing their impacts on non-commercial uses and natural resources

Objective I: Ensure that commercial uses of the Harbor are quantified and are sufficient to meet local needs.

Recommendation 1: Conduct an economic analysis to quantify the financial values of the Harbor to the Town.

Understanding the revenues and costs associated with the Harbor can inform policy decisions, focus investments, help set costs for services, and estimate capital and operating expenses. The economic analysis might include any of the following: (1) an analysis of all income generated for the Town as a direct result of harbor activities; (2) an analysis of all town capital and operating costs associated with the Harbor; and (3) an analysis comparing Dartmouth's harbor-related income and costs to similar harbors in the region.

Funding:

- The Town should seek grant funding for this research or engage a team of students and qualified community volunteers

Potential Implementing entities:

- Dartmouth Waterways Management Commission
- Various town departments, including the Parks and Recreation Board and Department, Harbormaster, and Treasurer/Director of Budget and Finance
- Local volunteers
- Consultant

Recommendation 2: Develop an inventory of (1) harbor-related services (e.g., moorings, haul-outs, repair facilities), and (2) potential sites for water-dependent uses. As part of this inventory, identify seasonal needs and opportunities for expanding the town's water-dependent uses and the Maritime Industrial District.

The inventory should identify services with respect to such factors as (1) the ability to prepare for a storm, (2) environmental impacts, (3) services in neighboring harbors, (4) variability in seasonal demand, and (5) the ability to meet current and future needs in the Harbor. The results of the inventory should be used to fill critical gaps in harbor services and should consider seasonal variability in services. (See the Land Use section of the Harbor Plan for recommendations pertaining to zoning and water-dependent uses.)

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- Dartmouth Environmental Affairs Department
- Dartmouth Planning Department
- Padanaram Business Association
- Local businesses

Recommendation 3: Explore options to increase pump-out operations in the fall to meet the demand created by end-of-season boat hauling activity.

Freezing overnight temperatures in late fall limit the pump-out boat's ability to function, yet pump-outs are often requested before vessels are hauled out for the season. One way to address this issue is to develop a schedule that boaters and commercial boat yards can use to plan their pump-outs. This scheduled approach would also be influenced by the weather, but would provide some predictability for both the boating community as well as the pump-out boat operators. In addition to the scheduled approach to late-season pump-outs, the Town should also explore the opportunity to extend sewer lines to Dias Landing in order to accommodate the installation of a shore-side pump-out facility.

Funding:

- Clean Vessel Act funds

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- Dartmouth Department of Public Works

Objective II: Promote public uses and/or services associated with commercial operations along the waterfront in a way that is compatible with business operations and safety concerns (Note: See Public Access section for additional recommendations).

***Recommendation 4:** Explore opportunities to highlight Dartmouth’s working waterfront and maritime history through the hosting of temporary community events along the waterfront such as “Touch-a-boat”, painting and photography classes, and other similar activities.*

These events should minimize disruption of existing working waterfront activities and ensure safety of participants. Special focus should be given to events that can take place between late fall and early spring, which coincides with the slow season for many of the commercial waterfront users.

Funding:

- Funding for these programs could be obtained through participation fees

Potential Implementing Entities:

- Community groups
- Waterfront business owners

Objective III: Minimize environmental impacts associated with commercial uses around the Harbor.

***Recommendation 5:** Require the use of permeable pavement and lot coverage by enforcing existing zoning by-laws (e.g., section 375-10.4 of Dartmouth’s Zoning By-law).*

As noted in greater detail in the section on water quality, minimizing the extent to which a parcel is covered with impervious surfaces such as roof tops and paved parking lots may help reduce runoff and water quality impairment.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Building Department

***Recommendation 6:** Develop a program recognizing businesses for their green practices relative to the health of the town’s water resources.*

Other municipalities and regions have developed programs that involve awards—decals to display upon meeting certain criteria or receiving an award—and free promotion through websites, directories, and press releases. Potential models for a program in

Dartmouth include Louisville, Colorado’s Green Business Program and Long Beach, California’s Green Business Certification and Recognition Program. Criteria might include factors such as implementation of components of the *Massachusetts Stormwater Handbook* (Volume 2 contains information on best management practices such as oil/grit separators and vegetated filter strips), installation of covered trash and recycling receptacles, and others.

Funding:

- Depending on the size of the program, the Town might seek grant or foundation support

Potential Implementing Entities:

- New municipal committee developed for purposes of running this program
- SouthCoast Chamber of Commerce
- Local businesses

Objective IV: Ensure that existing regulations pertaining to harbor uses minimize conflicts and establish clear guidance.

Recommendation 7: Review and update existing municipal regulations to ensure that definitions are clear and that commercial and recreational uses of the Harbor are balanced.

A review of regulatory language will help minimize conflicts and confusion. For example, the current regulatory language pertaining to moorings lacks clear definitions of terms and phrases such as “furtherance of a passive business endeavor”, “calendar year”, “vessels”, and “qualified” mooring gear inspector. Further, there is an opportunity to include language distinguishing “boatyard moorings” (*i.e.*, non-rental moorings for active boatyard use) from other moorings.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Waterways Management Commission
- Dartmouth Harbormaster Department
- Dartmouth Select Board



RECREATIONAL USES

Recreational fishing and activities along the shoreline (e.g., biking, walking) can be found in the Recreational Fishing and Public Access sections respectively.

The waters of Padanaram Harbor are used frequently for recreational activities including boating, kayaking, jet skiing, fishing, swimming/wading, waterfowl hunting, and standup paddleboarding. Recreational boating in particular is a very common activity in the Harbor, with most boating occurring in the southern portion of the Harbor due to shallow areas to the north of the bridge.

The Harbor is a major tourism draw for the Town, and hosts a number of marinas, marine repair services, pump-out facilities, and a public boat launching site. There are also approximately 930 moorings in total in the Harbor, and another 200+² moorings in town waters outside of the Harbor. Kayakers and paddleboarders are also active within the Harbor, and are able to launch from the shoreline of the town landing and at identified street ends on the east side of the Harbor.

Even with more than 930 moorings, moorings in the Harbor are in high demand. The waitlist had an all-time high of 400 people several years ago, which has been greatly reduced due to efforts by the harbormaster. That said, approximately 185 people remain on the mooring waitlist as of March of 2019³. There have been suggestions that the mooring field south of the bridge could allow for more vessels if re-gridded, but implementation would be difficult, if not impossible, for environmental and logistical reasons (see the background section for more detail).

The popularity of the Harbor is also reflected in the need for additional launching facilities, additional space for parking at launch areas and access points, and safe and secure dinghy, kayak, and vessel storage.

Issues

- Harbor congestion creates safety concerns and, if not properly planned, could worsen with any expansion of berthing or activities.
- While there has been an increase in moorings in the Harbor, there is still unmet demand.
- With more than 930 moorings available in the Harbor, there is a need for safe and secure dinghy storage and launching facilities.
- There is a need for secure storage of personal watercraft in addition to dinghies (e.g., motorboats and kayaks). Such storage should be designed to minimize potential for vandalism.
- There is limited public access and launching space for kayakers and paddleboarders. The Hill Street access point is difficult to use because of steep stairs, and there is no public parking other than limited on-street parking.
- The opening and closing of the bridge takes approximately 10–15 minutes, depending on the number of vessels transiting, and the schedule may affect

² Steve Melo, Dartmouth Harbormaster, March 2019. Pers. Comm. See Table 3 in part 2 of this document.

³ *Ibid.*

both vehicular and boating traffic. Mechanical malfunctions can extend openings.

- Climate change impacts such as storms and sea level rise may damage recreational infrastructure on and adjacent to the Harbor, and increase the need to relocate vessels to safe locations prior to flooding events.
- Water quality has continued to deteriorate in the Harbor which can cause closures of shellfishing areas and beaches, and makes conditions generally less pleasant for activities in or near the water.
- Fishing off the bridge can create a variety of safety hazards, create litter, and increase demand for parking in the Village.
- There is a lack of easily accessible information on walking or bike riding routes around Padanaram Harbor.
- There is a lack of anchorage space in the Harbor, which limits transient visits. The current anchorage space, in the southwest corner of the Harbor, is exposed to wind from the south, southeast, and east, resulting in minimal use.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Ensure that Harbor conditions, activities, facilities, and services support safe recreational uses, including boating, kayaking, fishing, paddleboarding, and sightseeing

Objective I: Encourage secure facilities and services to meet the needs of recreational users including moorings, launch access points, storage, and dockside amenities.

***Recommendation 1:** Determine the feasibility of creating additional boating facilities and secure in-water and landside storage options for watercraft and kayaks. Provide the structures and facilities as appropriate.*

The Town should determine if dockside space can be enhanced for motorboats and dinghies, including large dinghies. Specifically, the Town should consider creating facilities such as a town marina at the Arthur Dias Town Landing. If developed, the town marina should have additional floating dinghy space, dockage, and a pump-out (the latter would require a tie-in to a sewer line). Further, the facility could offer dockage and loading/offloading space for the commercial fishing vessels that utilize the Harbor.

With regards to in-water storage, given the large waiting list for moorings, the Town should determine if it is feasible to increase the number of moorings available in the Harbor. The Town should also investigate the possible use of street ends where they meet the harbor's edge or other lands in public ownership for dinghy/small craft storage and launch capabilities. Any addition of berthing should be done to limit conflicts with other existing harbor uses and minimize impacts on natural resources.

On land, the Town should determine if there is space for additional storage of kayaks (e.g., kayak racks) and small boats. The Waterways Management Commission and the Harbormaster Department installed new, more substantial, dinghy racks and a new rack for kayaks at the Arthur Dias Town Landing in 2018. Space in the new kayak rack sold out in a few days after installation and there is demand for additional kayak racks. Usage and need for further expansion should be evaluated regularly and, if necessary, additional capabilities should be provided.

The Town should also be aware of and adhere to Americans with Disabilities Act (ADA) requirements related to town-owned boating facilities and structures.

Funding:

- Departmental budgets
- U.S. Fish and Wildlife Service's Boating Infrastructure Grant (BIG)
- Massachusetts Seaport Economic Council
- Massachusetts Public Access Board
- Dartmouth Waterways Enterprise Fund

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- Dartmouth Planning Department
- Department of Parks and Recreation
- Department of Public Works

Recommendation 2: Enhance current launch access points for kayaks, paddleboards, and other watercraft, and identify additional potential access points including those with parking for small craft use.

Current launch access points (e.g., Hill Street) should be evaluated to determine nature and levels of use, amenities available and needed (e.g., public parking, trash cans), and possible improvements. Additional launch access points around the Harbor should also be considered, including street ends where they meet the harbor's edge or other lands in public ownership. The access points should be easily accessible and offer the necessary amenities such as public parking.

Funding:

- Departmental budgets
- Massachusetts Seaport Economic Council (if part of a larger project)
- Dartmouth Waterways Enterprise Fund

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

Recommendation 3: Increase awareness of existing transient boater moorings in the northern portion of the Harbor.

Currently, there are six transient moorings available north of the causeway. These may be used with permission and guidance of the Dartmouth Harbormaster Department. However, there is a general lack of awareness of these moorings by both Dartmouth residents and the transient boating community. The Town should consider promoting the presence of these moorings in cruising guides, on the Harbormaster's website, through a mobile application, and via other means to increase usage. Information on the depths and swing of these public moorings should be included as part of the promotional efforts.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

Recommendation 4: Where feasible, encourage use of the harbor's shoreline in such a way to promote uses and activities, particularly in town-owned areas.

The Town should encourage the use of the harbor's edge for water-dependent activities, such as launching watercraft, swimming, scenic viewing, and other similar activities. Specifically, there may be opportunities to enhance harbor-related activities occurring in Apponogansett Park, at town-owned road ends on the east side of the northern portion of the Harbor, or at the pump station on Russells Mills Road. As noted in Recommendation 1 of this section, the Town should also consider a town marina for dinghies and other small craft at Arthur Dias Town Landing.

Funding:

- Departmental budgets
- Fees associated with use of a new marina

Potential Implementing Entities:

- Dartmouth Parks and Recreation Department
- Dartmouth Department of Public Works
- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

Recommendation 5: Consider means to improve transportation between the shore and boats on moorings or at anchorage within the Harbor (e.g., a public launch service).

Encourage or establish a public launch service to/from shore to vessels anchored or moored in the Harbor. Additional public launch service might help alleviate shortages of dinghy storage or congestion at launch facilities. Such a service might run from the Arthur Dias Town Landing or the new Maritime Center dock.

Funding:

- Private business operation(s)

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Waterways Management Commission
- Private business operation(s)

Objective II: Ensure that watercraft storage facilities in Padanaram Harbor are safe and secure.

Recommendation 6: Install security cameras to monitor various areas within the Harbor, including the launch area and small boat storage at the Arthur Dias Town Landing.

While security cameras would not preclude vandalism and theft of small craft, they would assist in identifying the perpetrator(s) and in prosecution. The Dartmouth Waterways Management Commission already has plans to install security cameras at the launch area and small boat storage area at the Arthur Dias Town Landing. The Town should also consider security cameras at the Maritime Center and possibly other locations within the Harbor.

Funding:

- Dartmouth Waterways Management Commission
- Dartmouth Harbormaster Department

Potential Implementing Entities:

- Dartmouth Waterways Management Commission
- Dartmouth Harbormaster Department

Goal II: Ensure that information on recreational activities and safety in Padanaram Harbor is readily available

Objective I: Define and publicize how and where to safely conduct recreational activities within and around the Harbor to avoid use conflicts.

Recommendation 7: Define and publicize recreational areas in the Harbor, and consider adopting a by-law that identifies areas for specific uses within the Harbor.

The Town should work with stakeholders to define and map the areas in the Harbor that are used for specific recreational purposes (e.g., kayaking, tubing, jet skiing, water skiing, swimming, boat storage, and other uses). Once defined, the Town should develop and display proper signage both in and out of water that identifies where uses can occur (e.g., areas that are open for water skiing and other uses). Additionally, the Town should consider adopting a new by-law that identifies areas and provides legal support for specific uses within the Harbor (similar to the following by-law from Marion, MA: <https://www.ecode360.com/31534003>).

Funding:

- No funding needed at this time

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

***Recommendation 8:** Develop and disseminate educational and outreach materials for recreational users of Padanaram Harbor.*

The educational materials (e.g., brochures and signs) should identify designated areas for specific recreational uses in the Harbor and identify the harbor rules, regulations, and safety precautions, including information for those who rent kayaks or other watercraft. Additionally, educational materials should provide information on walking and bike riding routes around the Harbor (see the Public Access section of this document for more information), and historic and scenic sights (see the Historical and Cultural section for further information).

There are various areas around Padanaram Harbor of cultural and historic significance (e.g., the Colonial Russell Garrison site, historic shipyard locations, sites of villages or settlements that were established in historic times) as well as locations of scenic beauty. Preparation of a waterproof guide or shoreline signage could indicate the locations of these areas as approached from the water in paddle craft. Providing guidance to specific sites on a “water trail” might enhance the public enjoyment and understanding of the history, beauty, and natural resources of the Harbor.

The materials should be available to all watercraft renters, and should be distributed and/or displayed at Apponagansett Park, the Maritime Center, and other frequently visited locales for residents and visitors. Additionally, the Town should consider developing a mobile-focused website to convey information to local residents and visitors entering the Harbor.

Funding:

- Dartmouth Historical Commission
- Dartmouth Parks and Recreation Department
- The Kayak/Paddleboard vendor located at Apponagansett Park and/or the Padanaram Business Association (with associated advertisement support)

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

- Dartmouth Historical Commission
- Dartmouth Parks and Recreation Department
- Kayak/Paddleboard vendor at Apponagansett Park
- Padanaram Business Association

Objective II: Ensure that existing regulations pertaining to harbor uses minimize conflicts and establish clear guidance.

Recommendation 9: Review existing regulations to ensure that definitions are clear and that commercial and recreational uses of the Harbor are balanced.

The current regulatory language should be reviewed and adjusted as needed, especially for the removal of winter logs, the discharge of “sanitary waste”, jet ski regulations, and establishing local zoning authority for specific waterway area uses. Additionally, definitions are needed for terms contained in Mooring Regulation #3.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Waterways Management Department
- Dartmouth Harbormaster Department
- Dartmouth Select Board

COMMERCIAL AND RECREATIONAL FISHING:

Recreational and commercial fishing, including aquaculture, requires clean waters to ensure that fish and shellfish are healthy and fit for human consumption. Yet, as described in further detail in the Water Quality section of the Harbor Plan, pollution in the Harbor has resulted in restrictions to shellfishing and has affected important habitat, *e.g.*, eelgrass, for commercially and recreationally significant species.

Despite the partially restricted access to shellfish grounds, the community continues to participate in shellfishing activities in open areas. Their efforts are supported by the town's propagation and relay activities which aim to increase shellfish populations.

Recreational fishing is not limited to shellfish harvesting. An active recreational finfishery utilizes the Harbor both as its fishing grounds and as a departure and landing port for charter trips. Fishing from the causeway, in particular, is a highly visible tradition in Dartmouth, however conflicts arise between fishermen and other harbor users, as well as between fishermen and others causeway users.

The use of the Harbor for commercial fishing operations is less prevalent than for recreational fishing, yet the harbor's role in supporting the small commercial industry is imperative. Opportunities exist to provide additional berthing space and infrastructure (*e.g.*, at a new town marina) for the commercial industry, which also includes a slowly growing aquaculture industry.

Any new infrastructure or improvements to existing infrastructure should consider the potential impacts of climate change in order to ensure that the fishing traditions in Padanaram Harbor can continue.

Issues

- Recreational fishing on the causeway:
 - Can conflict with other uses of the area, including pedestrian and bike access as well as boating activity
 - Can create safety concerns for others on and beneath the causeway
 - Results in discarded carcasses and bait, attracting animals, and creating a foul odor
- Existing town by-laws are not regularly enforced regarding fishing on the causeway.
- Aquaculture may conflict with other harbor uses such as recreational boating.
- Impaired water quality in the northern Harbor prevents shellfishing activity.
- Enforcement of fishing regulations is challenging due to the length of coastline in Town and the limited staff dedicated to fishing-related enforcement.
- There is no local regulatory power to oversee finfish activity in Massachusetts. Size, catch, seasonal limits, as well as license compliance are enforced by the MA Environmental Police. Access points to allow fishing activity may be regulated locally to some degree, but only within the provisions of MGL Ch. 91.
- Climate change presents impacts to commercial and recreational fisheries both in terms of impacts to infrastructure and impacts to habitat (*e.g.*, water temperature and water chemistry) for target species.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Support commercial and recreational fishing activities in Padanaram Harbor

Objective I: Promote commercial aquaculture development in a manner that maintains and/or improves conditions in the Harbor relative to existing uses, habitat, and water quality.

Recommendation 1: Conduct educational programs on the topic of aquaculture to build interest in/support for the local industry.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Shellfish Constable(s)
- Local aquaculturists
- Dartmouth Waterways Management Commission
- Dartmouth Harbormaster Department
- Lloyd Center for the Environment

Recommendation 2: Identify locations in the Harbor that would be appropriate for aquaculture based on habitat, water quality, access, and competing harbor uses.

This exercise will allow the Town to thoughtfully plan aquaculture development in the Harbor, and will assist potential growers by streamlining the site selection process locally.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Shellfish Constable(s)
- Dartmouth Waterways Management Commission

- Dartmouth Harbormaster Department
- Dartmouth Environmental Affairs Department
- The Massachusetts Division of Marine Fisheries

Objective II: Ensure that infrastructure (e.g., mooring space, launch lanes, parking) and resources (e.g., enforcement staff) are in place to support commercial and recreational fishing activity in the Harbor.

Recommendation 3: Increase staffing to allow for shellfish propagation and depuration, aquaculture support and monitoring, and public outreach, as well as enforcement duties.

Additional staffing is needed to increase the harbor’s shellfish stock; work with state agencies to, where appropriate, open shellfish beds that have been closed due to water quality issues; advocate for aquaculture in suitable locations and monitor such activities; enhance the public understanding of the value of a healthy shellfish population; and support the maintenance and further improvements of shoreside infrastructure to assist shellfishers. Presently, the Shellfish Constable(s) are funded on a very limited, part-time basis. More hours and funding should be allocated in order to improve the shellfishing resources and monitoring of shellfish activities. These funds could be obtained through license fees, fees associated with the construction of new docks and piers (see Docks and Piers section), and other sources. Shellfish-related activities could continue under the Harbormaster Department, but the Town should also consider developing a new Shellfish Department.

Funding:

- Town budget
- Fees associated with waterways activities (e.g., shellfish licenses, aquaculture leases, dock/pier permit fees)

Potential Implementing Entities:

- Dartmouth Shellfish Constable(s)
- Dartmouth Harbormaster Department
- Dartmouth Select Board

Recommendation 4: Enforce existing by-laws relative to fishing from the Padanaram Bridge and causeway.

The Town by-laws (Section 146-6) include language relative to the fishing activities allowed and prohibited from the bridge. These by-laws should be consistently enforced to improve safety conditions and should be revised if a fishing pier is constructed.

Funding:

- No additional funding is needed beyond sign costs for properly posting areas

Potential Implementing Entities:

- Dartmouth Department of Public Works
- Dartmouth Police Department

Recommendation 5: Continue to pursue efforts to develop a fishing pier extending off the causeway.

A preliminary design for the fishing pier, extending south from the causeway, is currently under development. Construction of the fishing pier should eliminate conflicts with pedestrians on the bridge and causeway sidewalk and other harbor users, while providing safe fishing opportunities. The State provides funding for final design and construction through a competitive program. Current projections are that funding for construction may be several years away; however, having developed plans might position the pier project to move more quickly should another state-funded project not move forward and funding become available as a result.

Funding:

- Marine Recreational Fisheries Development Fund (MA Division of Marine Fisheries)

Potential Implementing Entities:

- Dartmouth Waterways Management Commission
- Dartmouth Department of Public Works
- Dartmouth Select Board

Recommendation 6: Explore opportunities to develop a commercial fishing dock.

The fishing dock could provide space for fishermen to load and unload gear and catches, and could provide both long-term and short-term berthing. The dock could be included in the plans for a town marina at the Arthur Dias Town Landing (see the section on recreational uses of the Harbor for more detail). Planning efforts should consider impacts on adjacent landowners and water users.

Funding:

- Departmental budgets
- Massachusetts Seaport Economic Council
- Dartmouth Waterways Enterprise Fund

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- Dartmouth Planning Department
- Department of Parks and Recreation
- Department of Public Works

Objective III: Conduct efforts to improve recreational fishing through stock enhancements and habitat improvements. (See the Water Quality section for recommendations pertaining to water quality improvements).

Recommendation 7: Continue to conduct relays, propagation, and management closures in order to enhance local shellfish stocks, and seek dedicated municipal funds for propagation activities.

Current propagation activities are funded through remediation grants associated with the Bouchard oil spill. Once that funding is depleted, additional sources of funding will be needed to maintain propagation activities.

Funding:

- The existing Shellfish Propagation Fund will need to be replenished. Potential funding might become available through acquisition of occupancy fees for Chapter 91 waterways licenses or increased valuation for docks and piers in the Dartmouth property tax process. (See the Dock and Pier section for further discussion.)

Potential Implementing Entities:

- Dartmouth Shellfish Constable(s)
- Dartmouth Board of Assessors
- Massachusetts Department of Environmental Protection, Wetlands and Waterways Division
- Massachusetts Division of Marine Fisheries

Recommendation 8: Reestablish a volunteer shellfish advisory group to advise Shellfish Constables regarding management, conservation, and propagation.

Historically, the Town had a Shellfish Advisory Board which informed the Select Board, which oversaw the actions of the Shellfish Constable. Though the Shellfish Advisory Board was never officially disbanded, it has not been active in the past few years. Re-establishing that body would bring additional attention to the various needs and opportunities related to shellfish management, water quality monitoring, and propagation.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Select Board
- Dartmouth Shellfish Constable(s)

Recommendation 9: Petition the Massachusetts Division of Marine Fisheries to conduct a full sanitation survey in the northern portion of Harbor for purposes of exploring whether or not new sections can be opened for recreational harvesting.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Select Board
- Massachusetts Division of Marine Fisheries
- Dartmouth Shellfish Constable(s)

LIVING MARINE RESOURCES

The economic and cultural value of Padanaram Harbor is based, in large part, on its natural resources. Significant wetland resources surround the Harbor, including marsh/bog, wooded swamp, salt marsh, and tidal flats. Wetlands are one of the most productive ecosystems in the world and support numerous aquatic and terrestrial species of plants and animals through all or part of their life cycle.⁴

Padanaram Harbor is designated as Essential Fish Habitat for various fish species. In addition, in Dartmouth the Massachusetts Endangered Species Act (MESA) classifies 53 species as Endangered (10), Threatened (19), or of Special Concern (24)⁵, highlighting the area's ecological significance (data are not available specific to the harbor area).

It is critical to promote the continued health of the ecosystem and natural marine resources of the Harbor. Recreational and commercial uses and development in the watershed, while also important to the local economy and culture, may have adverse impacts on these natural resources. Climate change may also affect the harbor's habitats and associated animal and bird species.

Issues

- The potential impacts to natural resources related to the causeway are not fully understood.
- Climate change impacts, including sea level rise, increase in the intensity and/or frequency of flooding events and storms, and changes in water temperature may affect the distribution and abundance of wetland habitats and associated animal and bird species.
- Eelgrass abundance has declined significantly compared to historic levels and it is uncertain whether it can recover (see Water Quality section for further discussion on this aspect).



⁴ Commonwealth of Massachusetts. Undated. Massachusetts Wetlands. Online at: <https://www.mass.gov/service-details/massachusetts-wetlands>

⁵ Massachusetts Division of Fisheries and Wildlife. Undated. Rare Species by Town Viewer. Online at: <https://www.mass.gov/service-details/rare-species-by-town-viewer>

GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Ensure the continued health of the ecosystem and natural marine resources of the Harbor

Objective I: Balance human use of the Harbor with sustainable management and protection of natural resources.

Recommendation 1: Consider management or protection of natural resources in all development and planning efforts.

Given the importance of both the natural resources in the vicinity of the Harbor as well as the human uses and related development, efforts should be made to ensure that human uses are conducted in a manner that sustains the natural resources. See the section on Cooperation and Coordination for information on the mechanism through which natural resources consideration may occur.

Funding:

- Town departmental budgets

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Conservation Commission
- Dartmouth Department of Public Works
- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- Entity developed as a result of the Cooperation and Coordination recommendations of this plan

Objective II: Regularly monitor conditions and resources within the Harbor and surrounding area.

Recommendation 2: Evaluate any potential impacts created by the causeway.

It has been suggested that the historical design and recent upgrades, in addition to any future changes, to the bridge and causeway may have impacts on water flow and natural resources in the Harbor. Although the causeway reconstruction project was designed with consideration of these factors, the natural resource conditions in the Harbor, particularly in the northern portion, should be closely monitored.

Funding:

- Town budget
- Shared funding with partner organizations

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Harbormaster Department
- Community members
- Lloyd Center for the Environment

- Coalition for Buzzards Bay
- University of Massachusetts Dartmouth

Recommendation 3: Regularly monitor changes in eelgrass within the southern segment of the Harbor and, if water quality improves, for evidence of eelgrass in the northern segment.

The Advisory Committee has established goals for water quality capable of sustaining eelgrass in the northern segment of the Harbor and capable of increasing the area and health of eelgrass beds in the southern segment. It will be important to monitor eelgrass existence and health in both areas if water quality increases—both to demonstrate water quality improvement and to define areas needing protection from human activities.

Funding:

- Town budget
- Shared funding with partner organizations

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Environmental Affairs Department
- Lloyd Center for Environmental Studies
- Coalition for Buzzards Bay
- Buzzards Bay National Estuary Program

Recommendation 4: Conduct surveys to assess the abundance and distribution of wildlife within the Harbor planning area.

While some data already exist on a town-wide or Buzzards Bay-wide scale, research at more refined scales may help inform management decisions and avoid conflicts between wildlife and recreational uses. Data about the wildlife in the Harbor also serve an important role in illustrating the overall value of the Harbor. Surveys, including seasonal bird population surveys, mapping of osprey nest locations, marine life surveys, and others, should be conducted on a regular basis, with the results made available to the public as appropriate (the location of some species habitat may be reserved from public view in order to protect the species). The Town should explore opportunities for students at the University of Massachusetts Dartmouth and volunteers with Mass Audubon and the Lloyd Center for Environmental Studies to conduct some of these surveys.

Funding:

- Town budget funding, perhaps through the Conservation Commission, could be leveraged with services, equipment, and volunteer time provided by partner organizations
- Included as a required component of development projects

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Partner organizations, *e.g.*, University of Massachusetts Dartmouth, Mass Audubon, Buzzards Bay Coalition

- Community members
- Dartmouth Harbormaster Department

Objective III: Support public education and information programs about the natural resources in the Harbor

Recommendation 5: Encourage Mass Audubon in their wildlife research, conservation, and education efforts, including exploring the potential to expand the South Coast Osprey Project.

The South Coast Osprey Project maintains about 100 osprey nest platforms, and monitors and records data on the osprey population, including banding, tagging, and tracking several birds. The project currently does not include Padanaram Harbor, although it is possible the project may expand in the future. The Town should encourage an evaluation of the impacts of osprey and continue to promote Mass Audubon as a resource for osprey education.

Funding:

- No additional town funding is needed to promote Mass Audubon’s activities
- Grant funds could be sought to evaluate the impacts of osprey

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Mass Audubon
- Community members

Recommendation 6: Explore opportunities to incorporate wildlife educational materials and displays at the Dartmouth Maritime Center.

To fully understand and appreciate all the natural resource benefits that Padanaram Harbor provides, residents and visitors to the Dartmouth Marine Center should be encouraged to learn about the diverse array of wildlife that the Harbor supports.

Funding:

- Town budget
- Shared funding with partner organizations, *e.g.*, Mass Audubon, University of Massachusetts Dartmouth

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Conservation Commission
- Partner organizations, *e.g.*, Mass Audubon, University of Massachusetts Dartmouth, Lloyd Center for Environmental Studies

PUBLIC ACCESS

Access to and from the Harbor has been critical for commercial and recreational reasons since the earliest inhabitation of Dartmouth. The Harbor also is critical as a “sense of place” for Padanaram Village with its shops, restaurants, and businesses and as a visual focus in the important context of a seaside town. Access to the resources of the Harbor, both physically and visually, is seen by town residents as significant feature. Some of the public access interests identified by residents in the Town Master Plan and Open Space and Recreation Plan, as well as public meetings and the initial survey conducted as part of this planning process, include:

- Getting to the shoreline for recreational activities such as boating, swimming, fishing and shellfishing, as well as perambulating and simply sitting and observing,
- Getting from the water to the shore for boaters, both local and transient,
- Visual access to the waters and the activities that take place there, and
- Access to shoreside facilities such as restaurants, shops, parks, and historic sites that are enhanced by their proximity to the water.

There are a number of types of access points to the Harbor including:

- Town-owned lands and facilities like parks, boat landings, conservation lands, roadways, and properties designed for specific purposes that also allow for access to the water’s edge,
- Access required as a provision of licensing of structures in public waters by the Massachusetts Department of Environmental Protection under the provisions of MGL Chapter 91, the Public Waterfront Act.

Often, a hindrance to public access is a lack of parking in areas around the Harbor. This relates to a larger question as to whether Padanaram Village should be considered a tourist/commerce destination or primarily serve residents. Parking to support the former differs drastically from parking needs to support the latter.

To many residents, visual access to the Harbor, its resources, and the activities that take place there appear to be as important as physical access. Presently there has been no inventory of scenic overlooks that would invite people from outside the immediate harbor area to come and view the harbor resources and beauty. Unfortunately, recent construction along the harbor’s edge has, due to requirements for building in the flood plain, resulted in significant blockage of views from public roadways and sidewalks. Further complicating access, some roadways in the harbor planning area do not have sidewalks, which creates safety issues.

Issues

- There is a need to define the “target audience” for public access—local vs. regional or statewide.
- Protection of private interests from public trespass or impacts from littering or noise is a concern related to increased or improved access.

- An inventory of appropriate access points or self-guided walking tours is needed.
- Uniform signage indicating access sites or pathways might help manage access as well as improve the aesthetic sense within the harbor region.
- There is a need for improved and expanded small craft storage facilities in various areas around the Harbor.
- Access is limited by parking design and facilities.
- Opportunities for access in some areas (*e.g.*, street ends that lead to the water or access under the provisions of Chapter 91,) are needed.
- Limited sidewalks create safety concerns and limit pedestrians access.
- Maintaining and improving visual and scenic access is important for those seeking passive enjoyment of Harbor resources.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Maximize public access to the resources of Padanaram Harbor in a sustainable manner without adversely affecting private properties or interests

Objective I: Develop and disseminate an inventory of public access points or sites.

***Recommendation 1:** Develop a descriptive inventory of existing public access points, ways, or sites.*

Presently there are a number of existing public access locations within the Harbor planning area. These include town-owned properties, commercial properties, and those with public access required through state waterways licenses. Currently, there is no comprehensive listing of these locations available either to planners or the public interested in such access. In the segment of this document related to docks and piers there is a recommendation to inventory all of the structures licensed under the provisions of the state Public Waterfront Act (*i.e.*, Chapter 91). Each of these licenses may also include requirements for some form of public access so that inventory should be incorporated into the listing recommended here. The inventory should include brief

descriptions of the location, means of access, and potential limitations for those seeking to visit the sites.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Department of Parks and Recreation
- Dartmouth Department of Public Works
- Dartmouth Environmental Affairs Department (regarding the Chapter 91 license inventory)
- MA Department of Environmental Protection

Recommendation 2: Make the results of the descriptive inventory available to town officials and the public-at-large via the town website, brochures, or other outreach mechanisms and materials.

Given that these access points, ways, or sites are public, it is appropriate to make both the public and town entities working with planning, construction or regulatory activities aware of the existence and any restrictions related to the various access.

Funding:

- Departmental budgets for website, funding needed for publication of paper-based materials

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Department of Parks and Recreation
- Dartmouth Pathways Committee
- Dartmouth Pathways Committee

Objective II: Design and utilize uniform signage for public access points.

Recommendation 3: Develop and utilize, wherever possible, uniform signage indicating public access points and sites as well as any limitations as to hours, activities, etc.

Uniform signage will help the public recognize areas where they have access. The signage can also be utilized to inform as to limitations as to hours and suitable activities. Additionally, the signs can provide information about the physical limits of the public access areas. The Dartmouth Pathways Committee had developed draft signage for consideration. (It should be noted that the MA Department of Environmental Protection, Waterways Division requires signage of their design on properties with public access mandated through Chapter 91.)

Funding:

- Design may be accomplished through departmental budgets. Production and posting of signs may require additional funding through Town meeting.

Potential Implementing Entities:

- Dartmouth Pathways Committee
- Dartmouth Department of Public Works
- Dartmouth Department of Parks and Recreation
- Dartmouth Harbormaster Department

Objective III: Establish defined walkways along the Harbor's edge based on the benefits accorded through the Massachusetts Public Waterfront Act (Chapter 91).

***Recommendation 4:** Construct a sidewalk along the water-side of Smith Neck Road extending the existing sidewalk at the causeway to the curves at the entrance to Bayview.*

The portion of Smith Neck Road between the causeway and Bayview is widely used by members of the public for walking, jogging, bicycling or simply enjoying the view of the Harbor. This is a relatively narrow roadway, heavily traveled by vehicles, with unimproved shoulders, where there is the potential for use conflicts or accidents. This potential is heightened by the presence of vehicular parking along the roadside in some areas.

The road layout is approximately 50 feet in width over this entire stretch, allowing for the installation of a sidewalk without acquisition of or intrusion onto private lands. Nor would any aspect of the roadway or the proposed sidewalk intrude into areas subject to Chapter 91. However, the current paved roadway is very close to the water-side of the layout so relocation of the road landward (to the west) would be necessary to allow for sidewalk construction. Other considerations include the fact that the road will over-wash during significant storms, sometimes leaving gravel, cobble, or even beached vessels to be cleared. This suggests that the roadway might benefit from being somewhat elevated or otherwise protected. The unimproved shoulders on both sides of the road are currently utilized for parking and provisions should be made in the design to continue to accommodate this usage. The design should also accommodate additional amenities to serve sidewalk users, such as trash cans.

The area between the existing marsh and the Harbor has been identified as a barrier beach under the provisions of the state Wetlands Protection Act and Dartmouth Wetlands Protection by-law and would require careful engineering to be considered under the provisions of those programs. That being said, the potential for a walkway along the road would open up very beneficial physical access to town-owned properties along the water as well as visual access to the remarkable vistas of the Harbor, boats moored there, the waterfront in Padanaram, and extended views of Buzzards Bay—in a far safer manner than currently exists.

The Dartmouth Pathways Committee has developed conceptual plans for such a sidewalk and has provided a survey of the existing road layout. These could provide a starting point for discussion of the details of a sidewalk design.

Funding:

- Preliminary design could be done using departmental budgets. Final design, permitting, and construction might depend on State Department of

Transportation fund availability.

Potential Implementing Entities:

- Dartmouth Department of Public Works
- Dartmouth Pathways Committee
- Dartmouth Conservation Commission
- Dartmouth Planning Department

Recommendation 5: Develop a plan for a public accessway along the Padanaram Village waterfront south from the causeway to the New Bedford Yacht Club and north from the causeway along Water Street utilizing both existing sidewalks and access granted through Public Waterfront Act (Chapter 91) licenses.

Presently, new sidewalks have been extended east from the bridge/causeway and south from Gulf Road along Elm Street to the New Bedford Yacht Club. Along this way are four properties subject to Chapter 91 licenses that offer public access options: Davis & Tripp, the condominiums at 280 Elm Street, South Wharf/Heritage Wharf, and the New Bedford Yacht Club. The license for the condominiums requires access from Elm Street to a pocket park at the water's edge. The license for South Wharf allows public access from Elm Street to the entire perimeter of the wharf. The license for the New Bedford Yacht Club limits public access to the inter-tidal zone. Access mandates for Davis & Tripp are less specific.

Additionally, there is public access, pursuant to Chapter 91 at 4 Water Street and access to the water at the foot of Hill Street.

The Town should develop a design for an accessway within these properties that recognizes the rights of the public to access these areas while also recognizing that several segments are working waterfront with heavy equipment usage and other potentially dangerous activities. Further, the design should take into consideration opportunities to locate benches, trash cans, and other amenities. Details of such a plan would have to be implemented by the Massachusetts Department of Environmental Protection (MA DEP) through their licensing process—and it should be clearly noted that the MA DEP would not be bound in any way by the town plan. However, MA DEP might respond positively to a plan that reflected both the interests of the Town and the safety and privacy concerns of the property owners. It should be noted that the liability by the property owners for proper usage of access required by Chapter 91 is waived, unless the property owner has behaved in a reckless manner⁶.

The Dartmouth Pathways Committee has developed a conceptual option for such an accessway that could be used as a basis for further discussion.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Pathways Committee

⁶ 310 CMR §9.35 (6)

- Dartmouth Harbormaster Department
- Affected property owners

***Recommendation 6:** Identify and provide signage for other significant public access areas adjacent to the Harbor established through the provisions of Chapter 91.*

There are other, non-contiguous locations within the harbor area where Chapter 91 licenses have identified public access, e.g., 4 Water Street or the Marshall Yard. There should be signage to indicate public access to these areas and how they link to any sidewalks, pathways or other pedestrian ways nearby.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Pathways Committee
- Dartmouth Harbormaster Department
- Affected property owners

***Recommendation 7:** Wherever feasible, incorporate options to provide access to people with disabilities into planning and construction near the Harbor. This should be mandatory for town-funded projects. Additionally, where appropriate, requests for such accessibility should be part of the Planning Board’s comments on Chapter 91 licensing applications.*

Standards to provide access to people with disabilities under the Americans With Disabilities Act (ADA) are provided in “Appendix G: ADA Access Self-Evaluation”, of the “Open Space and Recreation Planner’s Workbook”⁷.

Funding:

- Incorporated into planning and construction project budgets

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Department of Public Works
- Dartmouth Department of Parks and Recreation
- Dartmouth Pathways Committee

Goal II: Improve parking options within Padanaram Village and areas surrounding the Harbor

⁷ Open Space and Recreation Planner’s Workbook, 2008, Massachusetts, Division of Conservation Services, <https://www.mass.gov/files/documents/2016/08/tx/osrp-workbook08.pdf>

Objective I: Identify existing and potential parking locations in the Village and around the Harbor and quantify the need for any additional parking.

Recommendation 8: The Town of Dartmouth should clarify its vision for the current nature and the future of Padanaram Village.

There are competing visions of what Padanaram Village is and will become (depending somewhat on how one defines the boundaries of the Village.) If the Village is a small residential area with services sufficient to serve the inhabitants, limited parking should suffice. If, however, the Village is a destination for shoppers, boaters, and tourism, then additional parking is necessary now and even more may be needed in the future. Such a determination should be part of a town-wide planning effort such as an update of the Master Plan.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Department of Public Works
- Dartmouth residents
- Padanaram Business Association

Recommendation 9: Inventory the existing parking spaces within the Village, both public and private.

There are several categories of parking within the Village: on-street public parking; private parking areas; parking areas associated with shops, businesses, churches, marinas; and the Yacht Club. An inventory would clarify the number of presently available parking spaces and their locations and limitations, if any, on usage.

Funding:

- Departmental budget

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Department of Public Works
- Padanaram Business Association

Recommendation 10: Identify potential additional parking options.

While there is limited open space where additional parking could be developed within the Village, some options have been suggested including:

- use of the site of the former fire station/Parks and Recreation building,
- making some streets running east from Elm Street one way with the closed lane dedicated for parking,
- use of the School Department building lot, and/or
- use of church parking lots with an associated shuttle.

The Dartmouth Pathways Committee has prepared conceptual designs to show potential options for the first two options listed above, which can be a basis for discussion. There may, however, be a need for a public meeting to ensure a wide-ranging review of options by the various interested parties.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Department of Public Works
- Affected residents
- Padanaram Business Association
- Dartmouth Pathways Committee

Recommendation 11: Implement the selected parking options identified in recommendation 10.

Funding:

- Depending on the option determined, funding might come through a grant, such as the Complete Streets funding, to the Dartmouth Department of Public Works (on-street parking), the business community (off-site parking lots and shuttle), or town capital expenditures (the former Fire Department building).

Potential Implementing Entities:

- Dartmouth Department of Public Works
- Dartmouth Select Board
- Dartmouth Town Meeting
- Padanaram Business Association

Goal III: Protect the scenic vistas of the Harbor and its surrounding area

Objective I: Inventory significant scenic vistas and identify means for their protection.

Recommendation 12: Identify significant scenic vistas within the Padanaram Harbor planning area.

The Massachusetts Scenic Inventory identified several general areas around the Harbor as significant. However, for management options to be effective, more specificity will be needed. Either the Dartmouth Planning Department or an independent Commission or Committee, appointed by the Select Board, should develop an inventory of significant scenic locations and vistas. The Town did not participate in the State Heritage Landscape Inventory, but the criteria from both the Scenic Inventory and Heritage Landscape Inventory could be utilized in this process, coupled with local values and criteria. The results of the inventory should be incorporated into the town's GIS.

Funding:

- Existing department budgets

Potential Implementing Entities:

- Dartmouth Planning Department and/or Select Board appointed Committee
- Dartmouth Historical Commission
- Dartmouth Environmental Affairs Department

Recommendation 13: Develop techniques for protection of the identified scenic locations and vistas.

Various techniques should be explored for the protection of the scenic locations including:

1. Acquiring land associated with scenic vistas
2. Incorporating protection of scenic locations vistas within zoning standards or other land use decisions
3. Defining protection of aesthetic values within the Dartmouth Wetland Protection By-Law for those scenic vistas falling under that by-law's jurisdiction

Funding:

- Departmental budgets or non-governmental organization funding

Potential Implementing Entities:

- Item 1. Dartmouth Community Preservation Committee, Dartmouth Natural Resources Trust, Dartmouth Conservation Commission
- Item 2. Dartmouth Planning Department/Board, Town Meeting, Dartmouth Zoning Board of Appeals
- Item 3. Dartmouth Conservation Commission

Objective II: Minimize restricting views of the Harbor through construction of housing or commercial structures.

Recommendation 14: Identify mechanisms to minimize blockage of views of the Harbor from public area.

There are several ways that views of the Harbor from public ways or public property are obscured, including:

- tall hedges/vegetation or fences
- buildings that extend almost entirely across lots
- buildings elevated due to requirements of flood plain by-laws

At least some of these impacts could be minimized through revised zoning requirements or financial incentives through tax rebates.

Funding:

- Departmental budgets

Potential Implementing Entities:

- Dartmouth Planning Department

- Dartmouth Planning Board
- Dartmouth Building Department
- Dartmouth Zoning Board of Appeals

DOCKS AND PIERS

Docks present an interesting management scenario. On one hand, communal and commercial docks provide increased public access to water activities. Residential docks do also, albeit to a smaller public element. Additionally, residential docks will increase property values, with a secondary impact of increasing property tax income for the Town.⁸

On the other hand, docks protrude into public waters, may have environmental and aesthetic impacts, and may affect navigation or public access along the shoreline. The most common environmental impacts of docks include:⁹

- Short-term construction and chronic impacts of docks and their usage on shellfish and shellfish habitat,
- Short-term construction and chronic impacts from shading on marsh vegetation or eelgrass where present,
- Impacts on navigation and other usage of public waterways.

Aesthetic and visual impacts evolve out of “over-development” or “shoreline sprawl” as a minimally developed shoreline is built out with more property owners wanting the amenity of having private dockage.¹⁰

As of late 2017 there were approximately 80 docks within the waters of Padanaram Harbor—mostly relatively small residential docks, but also some commercial and public dockage. There is approximately a similar number of waterfront lots in the planning area that do not currently have docks.

Proposed docks require at least two permit reviews; an environmental review by the Dartmouth Conservation Commission under both state and local law/by-law and regulations. Because they project into public waters, docks are also reviewed by the MA DEP for impacts to navigation and public access. The Dartmouth Planning Board has a role in that it is the agency with the authority to prepare comments to the MA DEP on behalf of the Town. Docks are not presently reviewed under the provisions of local zoning or the local building code.

The Dartmouth Wetlands Protection Regulations preclude impacts on mooring areas or navigation to, from, and around mooring areas. Presently, there is no formal definition of “mooring areas” for the purposes of this by-law. In making its decision on the appropriate design of a proposed dock, the Conservation Commission relies on comments from the Harbormaster Department on each proposal as to potential impacts on moorings and shellfish.

⁸ In Dartmouth, residential docks are valued at \$50–\$70/linear foot, based on the nature of the structure, under 2018 assessment per Town Assessors’ Office.

⁹ Kelty, Ruth and Steve Bliven, “Environmental and Aesthetic Impacts of Small Docks and Piers: A Workshop Report”, 2003. NOAA Coastal Ocean Program Decision Analysis Series #22. Available at http://www.myfmca.org/wp-content/uploads/2009/12/023_dockpier.pdf.

¹⁰ Bliven, Steve and Ruth Kelty, “Visual Impact Assessment of Small Docks and Piers: Theory and Practice”, 2005. NOAA Coastal Ocean Program Decision Analysis Series #24. Available at <https://repository.library.noaa.gov/view/noaa/2077>.

From the project proponent’s perspective, the permitting process for docks can seem protracted and unclear. In large part, this is due to the varying regulatory interests and agencies responsible for making decisions on the project.

Issues

- The Town currently has no effective mechanism or standards to address cumulative impacts, either environmental or visual, from dock construction and use.
- The Town does not have an inventory of docks within Padanaram Harbor that have been licensed under the state’s Chapter 91 process.
- There are presently no formally delineated mooring areas for use in Dartmouth Wetlands Protection by-law reviews. Consequently, the Conservation Commission must consult with the Harbormaster on each proposal (and each refinement of each proposal) to ensure that mooring areas are not adversely impacted.
- The methods to protect shellfish or mitigate for their loss seem to vary from dock to dock, sometimes requiring removal of the shellfish to another area and sometimes requiring payment of a fee for shellfish propagation.
- The permitting process sometimes appears to be both protracted and offer limited predictability due to the varying regulatory and licensing entities, standards, and timelines.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Ensure that all docks in Padanaram Harbor are appropriately licensed and permitted according to federal, state, and local laws and regulations

Objective I: Establish an inventory of existing docks within Padanaram Harbor along with their licenses under Chapter 91 and

Orders of Conditions under the Wetlands Protection Acts. (See also Objectives and Recommendations under the Public Access section.)

***Recommendation 1:** Review records held by the Massachusetts Department of Environmental Protection, Waterways Division (MA DEP Waterways) to identify licenses for structures within the Padanaram Harbor Management planning area and collect copies or meaningful data from each.*

The MA DEP Waterways Division maintains records regarding each license issued under the provisions of Chapter 91, the Public Waterfront Act. These licenses identify location, licensee, parameters of the structure, and public access benefits accrued. The Town should acquire copies of, or the relevant data from, these licenses to retain locally.

A preliminary review of the MA DEP Waterways files and collection of data was conducted as part of the Padanaram Harbor Planning effort. This should be continued through the Dartmouth Environmental Affairs Office.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Environmental Affairs Office

***Recommendation 2:** Enter the data from Chapter 91 licenses and Orders of Conditions from the Conservation Commission, past and future, into the Town of Dartmouth Geographic Information System.*

Entering these data into the GIS database will allow ease of retrieval of information about specific structures and well as density of structures within specific areas for both regulatory and planning purposes.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Environmental Affairs Department

Objective II: Ensure that existing docks within Padanaram Harbor are consistent with licenses and permits issued by the MA DEP and the Dartmouth Conservation Commission.

***Recommendation 3:** Compare each structure within the Padanaram Harbor Management planning area with the Chapter 91 license and Order of Conditions from the Conservation Commission to ensure that 1) each structure has a valid license and Order of Conditions and 2) that it is in compliance with the most recent license and Order of Conditions.*

Using the data entered into the Town of Dartmouth GIS data base, a field review of each structure should be made to ensure that such structures have been approved through Chapter 91 and the town and state Wetland Protection processes. Further, each should

be reviewed to ensure that they are in compliance with these licenses and Orders of Conditions. A field survey could be done either by vessel or through the use of drone photography.

Funding:

- Existing departmental budgets for the Dartmouth Environmental Affairs Department and Dartmouth Harbormaster Department

Potential Implementing Entities:

- Dartmouth Environmental Affairs Department
- Dartmouth Harbormaster Department

***Recommendation 4.** Report any unlicensed structures or those out of compliance, as well as any abandoned or derelict structures, to the appropriate authorities for enforcement action.*

Any structures found to be unlicensed or out of compliance with a Chapter 91 license should be reported to MA DEP Waterways with photographic documentation. Those structures found to be without a valid Order of Conditions or out of compliance with a valid Order should be reported to the Dartmouth Conservation Commission and/or the Massachusetts Department of Environmental Protection Wetlands Division.

Funding:

- Within the existing departmental budgets for the Dartmouth Environmental Affairs Department and Dartmouth Harbormaster Department

Potential Implementing Entities:

- Dartmouth Environmental Affairs Department
- Dartmouth Harbormaster Department

Goal II: Ensure that construction and use of docks do not adversely affect the natural resources or commercial and recreational uses within Padanaram Harbor

Objective I: Maintain or improve the standards for the protection of shellfish from dock construction and use.

***Recommendation 5:** Prohibit the construction of new private, residential docks or expansion of existing such docks in areas with significant productive shellfish populations.*

Docks and piers can adversely affect shellfish populations during construction and subsequent use. Additionally, they generally preclude the harvesting of shellfish under or near the structures.

As part of this effort, the Town would have to establish a standard threshold to define “areas of significant productive shellfish populations.” (As an example, Falmouth Wetland Regulations use the following: The area is significant if, within a nine square-foot area, a shellfish survey finds one quahog, one clam, three oysters or three mussels.) Development of such a standard could involve use of MA Division of Marine Fisheries

mapping products, local knowledge, and/or shellfish surveys. The Town might choose to map areas based on sediment types, depth, water quality, etc. as significant areas for suitable shellfish habitat.

Funding:

- Existing departmental budgets

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Shellfish Department

Recommendation 6: *For areas that fall below the significant productive threshold, require mitigation for loss of shellfish or shellfish habitat by removal of any existing shellfish and/or paying a fee to a Shellfish Propagation Fund.*

Removal of any existing shellfish in the area of a proposed dock to an approved location protects the individual shellfish. Establishment of a Shellfish Propagation Fund with fees paid by applicants for an Order of Conditions for a dock or pier will help maintain shellfish populations. As references, the Town of Marion currently charges a \$500 fee, paid to a specified fund, where a dock is proposed in an area of potential shellfish habitat, and Falmouth charges a fee equivalent to the cost of 10,000 seed quahogs (approximately \$300–\$400 at 2018 prices).

Funding:

- Existing departmental budgets to establish the program
- Income to the Shellfish Propagation Fund would occur during implementation

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Shellfish Department

Objective II: Protect established mooring and anchorage areas against encroachment from private docks.

Recommendation 7: *Define mooring and anchorage areas within the Harbor, fairways leading to and through mooring areas, and critical navigation areas around moorings and anchorages. Prohibit intrusion of docks into such areas when issuing an Order of Conditions through the Conservation Commission.*

Mooring and anchorage areas require space for vessels to swing with the tide and winds. Additionally, they need space to navigate to, from, and within the areas. A fixed structure like a dock or pier can interfere with these areas and navigation. Presently, the gridded mooring area in the northern portion of the Harbor is clearly defined but there are other mooring areas within the Harbor, e.g., between the island and the eastern shore and in the vicinity of Marshall Marine, that are not as clearly demarcated. The Harbormaster, working with the Geographic Information System capabilities of the Conservation Commission, should map such areas to provide clarity and predictability to those proposing docks.

Funding:

- Existing departmental budgets

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Conservation Commission

***Recommendation 8:** Incorporate the maps produced from implementation of Recommendation 7 above into the Dock and Pier Regulations of the Dartmouth Wetland Protection Regulations as areas where docks and piers are prohibited.*

Once the maps of mooring and anchorage areas have been prepared, they should be incorporated into regulatory language and utilized in reviews under the Dartmouth Wetlands Protection By-law and Regulations.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Conservation Commission

Goal III: Ensure that cumulative impacts of multiple docks within Padanaram Harbor are appropriately managed to protect natural resources, the scenic quality of the area, and public access along the shoreline

Objective I: Develop standards to evaluate and manage cumulative impacts on the natural resources of the Harbor.

***Recommendation 9:** Create standards within the Dartmouth Wetlands Protection By-law to protect shellfish, eelgrass beds, saltmarsh, and water quality interests from cumulative impacts related to dock construction and usage.*

Four resources particularly subject to cumulative impacts within the Harbor are shellfish (largely for increased numbers of dock construction and associated boat usage), eelgrass beds (from shading and/or boating impacts), saltmarsh (from construction and shading) and water quality (from increased turbidity from boat propellers in shallow areas near docks).

The Dartmouth Wetlands Protection By-law is implemented on a case-by-case basis, judging impacts from individual proposed projects. Unfortunately, cumulative impacts from multiple projects below the thresholds of the By-law can result in significant impacts. Modifying the By-law to address cumulative impacts, or utilizing an area or zoning-like approach can provide a strategy for managing such impacts.

Mechanisms to be considered include:

- Density of docks, particularly in shallow areas,
- Length and overall area of docks,
- Depth of water at the water-side terminus of docks,
- Boating type and usage at docks,
- Presence of shellfish or suitable shellfish habitat in the area,

- Presence or proximity of eelgrass in the area (an issue that may become more important if water quality improves within the Harbor),
- Presence of salt marsh in the area, and
- Sediment type in the area.

A recommended approach is to define various areas along the shoreline, based on factors such as water depth, sediment type, number of existing docks, and number of potential docks, and set limits on new construction for those areas. Encouragement of communal or community dockage can lessen the overall numbers while also concentrating boating usage in specific locations.

An additional tool is 310 CMR §9.38(b) of the Chapter 91 regulations which preclude the DEP from issuing a license for “a private recreational boating facility with fewer than ten berths” if such a facility “does not conform to a formal, areawide policy or plan which establishes municipal priorities among competing uses of the waterway” (e.g., navigation or shellfish or shellfish habitat protection).

Once developed, these standards should be utilized both within the decision-making process of the Conservation Commission, and also by the Planning Board and Planning Department in its comments, on behalf of the Town, on Chapter 91 license applications.

Funding:

- Department budget, although there may be need for contracted technical assistance in the process

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Planning Department
- Dartmouth Planning Board
- Dartmouth Town Meeting (if zoning changes are needed)
- MA Division of Marine Fisheries (for technical assistance)

Objective II: Develop standards to evaluate the cumulative visual impacts of density and scale in order to protect the scenic quality of the Harbor.

Recommendation 10: Establish standards for the protected aesthetic interest contained in the Dartmouth Wetlands Protection By-law.

Dock construction requests, particularly in the northern portion of the Harbor, have been increasing. This area is relatively shallow, requiring docks to extend further to reach navigable depths than the area south of the causeway. Some members of the public have expressed concerns related to cumulative environmental impacts as discussed above however, increasing concerns about the density of docks and resultant visual impacts have also been raised. While landside zoning regulates lot sizes and building coverage, setbacks, and heights, there is presently no similar comprehensive management for shoreline structures that extend into highly visible and public waters. As dock development pressures increase, there may be greater scrutiny of the visual, or aesthetic, effects on the Harbor. The Dartmouth Wetlands Protection By-law provides a mechanism to manage these impacts but presently does not offer standards against

which proposed construction can be measured. Options could include establishing limits on dock lengths, depth of water at seaward ends of docks, greater setbacks from property lines, greater emphasis on communal or community docks, and/or defining areas where docks would not be permitted.

One specific option would be to establish an area on the western side of the northern portion of the Harbor (perhaps excluding the Star of the Sea area which is almost fully developed with docks currently) where new dock construction would be limited to small platforms that do not extend far into the water, designed for launching paddle or rowing craft or for small boat storage.

Funding:

- Departmental budgets and/or grant funds

Implementing Entity:

- Dartmouth Conservation Commission
- Dartmouth Planning Board

Objective III: Implement cumulative impact standards through the State and local wetlands protection laws and regulations and the Planning Board reviews under the provisions of Chapter 91 and/or new by-laws.

Recommendation 11: Modify the existing Dartmouth Wetlands Protection By-law regulations to incorporate standards for the management of cumulative environmental and aesthetic impacts.

This would require changes either to the By-law itself or the regulations supporting that By-law.

Funding:

- No additional funding is needed to implement this recommendation

Implementing Entity:

- Dartmouth Conservation Commission
- Dartmouth Town Meeting if changes to the By-law are necessary

Recommendation 12: Explore options for establishing limits on dock construction (size, extent into the water, property line set-backs) through zoning.

While review under the Wetlands Protection By-law requires a case-by-case evaluation, zoning provides defined standards as to what structures will be allowed.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Planning Board
- Dartmouth Town Meeting

Objective IV: Protect safe riparian access and navigation.

Recommendation 13: Ensure that comments on applications for Chapter 91 licenses made on behalf of the Town by the Planning Board call for protection of pedestrian movement along the intertidal zone and safe navigation by vessels along the shore areas.

The Planning Board has the authority to make comments, on behalf of the Town, on applications for Chapter 91 licenses in the waters of the Town. These comments should call for ease of passage along the intertidal zone for the legislatively ensured rights of “fishing, fowling, and navigation” but also for pedestrian strolling in mitigation for use of public waters for a private dock. Similarly, such comments should address whether the proposed dock would cause a hazard to, or impair, navigation.

Funding:

- No additional funding is needed to implement this recommendation

Implementing Entity:

- Dartmouth Planning Board

Goal IV: Ensure a fair and efficient licensing and permitting process that provides predictability and timely decisions for proposed docks within Padanaram Harbor

Objective I: Improve the town’s existing license and permit processing system for residential docks and piers to make it more predictable and efficient, ensuring a timely a decision for applicants, while protecting all of the interests provided by state and local laws and by-laws.

Recommendations 14: Ensure effective communication and coordination between reviews by the Conservation Commission and the Planning Board.

Presently the Conservation Commission reviews proposals for dock construction or expansion under the provisions of the Massachusetts Wetlands Protection Act and the Town of Dartmouth Wetlands Protection By-law. These reviews are primarily for environmental impacts (although the local By-law also evaluates for recreational and aesthetic aspects). The Planning Board is the local contact for comments as part of the MA DEP review under the provisions of Chapter 91, the Public Waterfront Act. The Planning Board also has the authority to review applications for docks to determine whether they qualify for the “general permit” process established by the MA DEP. Applications under these two programs may not come at the same time. Consequently, a full and efficient communication process is needed between the Conservation Commission and the Planning Board, including such aspects as:

- notification of receipt of applications,
- communication regarding issues addressed during project evaluation,
- changes in design during project review to ensure that both the Commission and the Board are reviewing a similar final design, and

- requirements established by the Conservation Commission in Orders of Condition that might affect a decision by the Planning Board.

These measures will ensure better implementation of both processes, result in a timely and predictable decision for applicants, and promote consistent implementation of town goals in managing impacts from docks.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Planning Board
- Dartmouth Harbormaster Department

Recommendation 15: Prepare outreach materials targeted to prospective applicants for dock licenses and permits that explain the application and review process, the resources that are to be protected, and the agencies making the reviews.

Some applicants are unclear as to the procedures and standards that must be met in order to receive permission to construct a dock. Providing prospective applicants with a better understanding of the process and purposes of the reviews should offer more predictability as to both the timeline and the end result.

Funding:

- Departmental budgets
- Waterways Enterprise Fund

Potential Implementing Entities:

- Dartmouth Conservation Commission
- Dartmouth Planning Board
- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

Goal V: Ensure that the public benefits such as navigation, public access, and shellfishing, lost through the occupation of segments of the Harbor by docks and piers, are mitigated in an equitable fashion

Objective I: Provide financial benefits to the Town from private individual use of public waterways.

Recommendation 16: Review the current process for taxing residential docks to more accurately reflect the value they add to a property as well as the impact they have on the public resource.

Currently, the presence of a dock or pier on a residential property increases the value of that property for purposes of local real estate taxes. Under the 2018 town property assessment, residential docks are valued at \$50–\$70 per linear foot (based on the nature of the structures) for property tax purposes. Using 2018 figures, at the \$10.11

property tax rate (Town plus Fire District 1) a 100-foot dock valued at \$60 per linear foot would be assessed approximately \$61 in taxes. By comparison, a 30' boat owned by a Town resident on a mooring would pay approximately \$50 in Mooring Fees and another approximately \$60 in mandatory mooring inspection fees—or a total of \$110. (Note that mooring inspection fees are paid, under town regulation, through contracts with private companies, not to the Town. Consequently, costs to the boat owner may vary.) The Town should consider increasing the valuation on privately owned docks both to reflect the additional value they add to a parcel of land and to mitigate the loss of public use of waters of the Town. Additional income should be put into a dedicated fund for better management of the Harbor, including improvements to public access in and around the Harbor.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Board of Assessors
- Dartmouth Select Board

Recommendation 17: Consider applying the current waterways fees to floats attached to piers.

Currently fees for waterways services are charged for boats on moorings with the amount of the fee correlating to the length of the vessel. While vessels kept at docks are charged the same fees as moored boats, the floats attached to fixed piers are not charged similar fees—while occupying space in the waterway. The Town should consider extending waterways fees to floats, with the funds deposited in the Waterways Enterprise Fund.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

Recommendation 18: Work with the Massachusetts Department of Environmental Protection's Waterways Division to have displacement fees paid under the provisions of Chapter 91, the Public Waterfront Act, forwarded to the Town to accrue to a harbor-related fund.

Under the provisions of Chapter 91, dock and pier licensees pay a displacement fee to the Department of Environmental Protection, Division of Waterways. By law, the MA DEP may return these fees to the Town where the structure is located, for waterways-related purposes. While these fees are minimal, if there are a significant number of structures, over time such payments could assist with shellfish propagation, dock inspections, or other tasks.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Harbormaster
- Dartmouth Town Administrator
- Dartmouth Director of Budget & Finance
- Massachusetts Department of Environmental Protection

FLOODING AND CLIMATE CHANGE

Dartmouth has a long history of storm-related flooding events; and a significant portion of the harbor planning area currently lies within a flood zone, as shown in Figure 3. The flood plain is expected to expand with climate change, which may result in as many as six to seven feet of sea level rise in Dartmouth by the end of this century. These rising seas, coupled with elevated storm surges, will increase the number of properties vulnerable to coastal flooding not only from nor'easters and hurricanes, but also from the twice-daily high tide, which is projected to impact portions of the Bay View Marshes, Star of the Sea, and New Bedford Yacht Club.

In addition, as precipitation events become more intense, the Town is likely to experience new issues related to flooding.

Flooding not only creates risks to property, it elevates the need for planning (*e.g.*, zoning changes, new construction standards, land acquisitions) to minimize impacts to infrastructure and other resources. Flooding associated with storms also necessitates planning to ensure that vessels can be removed from the Harbor and stored safely and that people can evacuate vulnerable locations.

Issues

- In the event of a storm under existing conditions, flooding could have significant impacts on the local community and economy in and around Padanaram Harbor. For example, following flooding events, people may not be able to return to their properties, waterbodies may be contaminated, and shellfish beds may need to be closed. Most of the commercial district and water-dependent uses surrounding the Harbor fall within the existing baseline floodplain, along with numerous private residences.
- Climate change will exacerbate flooding in Dartmouth—both during storm events and during normal tidal cycles—and the Town needs to develop strategies to address anticipated risks.
- Flooding presents several safety issues in and around the Harbor that may impact safety response times, the structural integrity of infrastructure, and loss of life and property.
- Education and planning is needed to address flooding and sea level rise.
- Climate change will have impacts on natural resources in a manner that could impact harbor users.

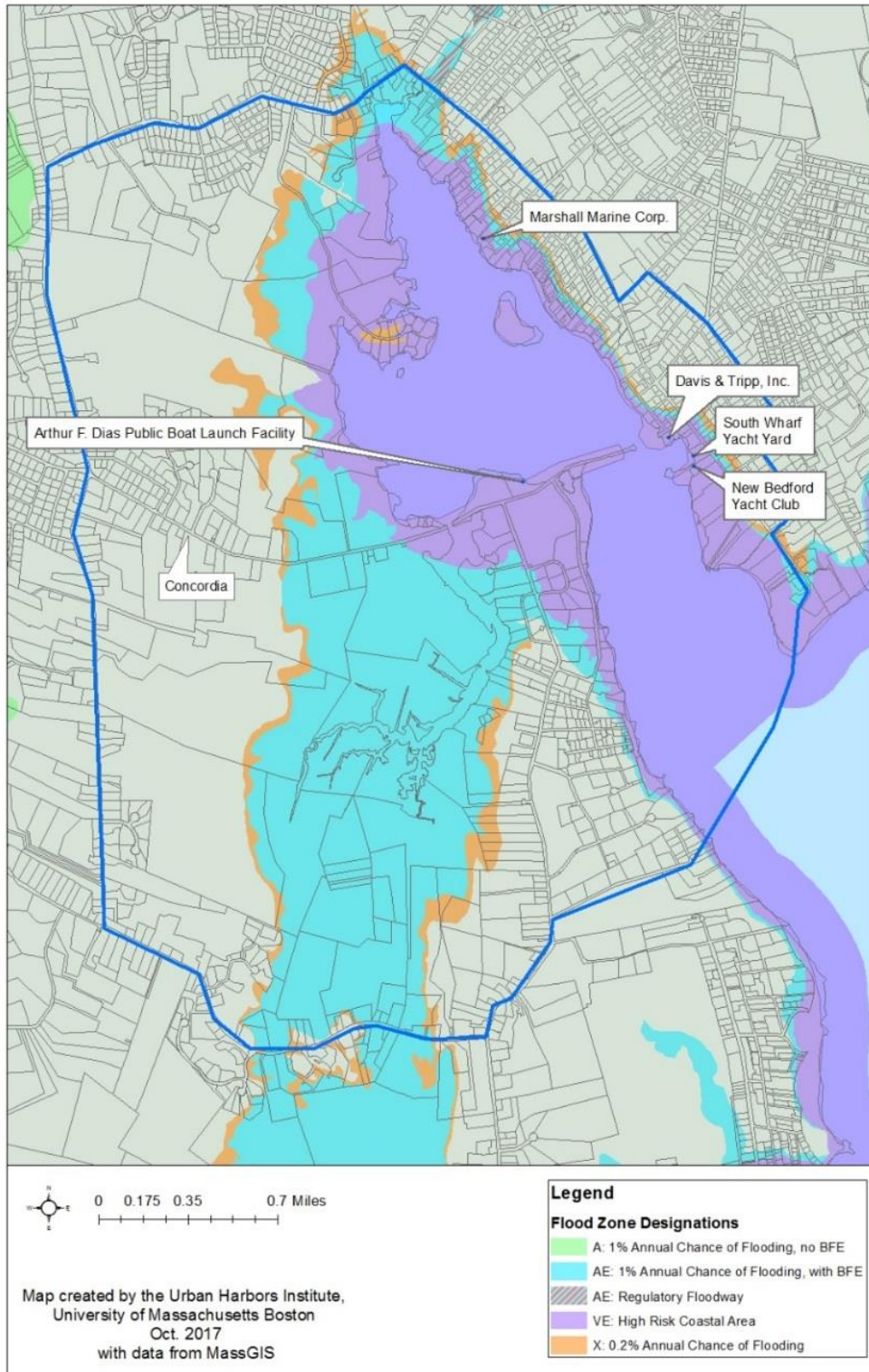


Figure 3: FEMA flood zones in the Harbor Plan area



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Minimize impacts of flooding events

Objective I: Ensure that measures are in place to address all impacts associated with current flooding scenarios for Padanaram Harbor

***Recommendation 1:** The Town should consider participating in the National Flood Insurance Program's Community Rating System.*

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) encourages communities to take voluntary floodplain management measures to reduce flood risks in accordance with the three goals of the CRS program: (1) reduce flood damage to insurable property, (2) strengthen and support the insurance aspects of the NFIP, and (3) encourage a comprehensive approach to floodplain management. Participation in the CRS can result in discounted flood insurance premium rates due to a reduction in flood risks.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Select Board
- Dartmouth Planning Department

***Recommendation 2:** Continue to implement the action items in the 2015 Hazard Mitigation Plan.*

Some of the key action items relevant to the Harbor Plan include ensuring safe and efficient evacuations, communicating effectively with residents during emergencies, and addressing infrastructure needs in flood-prone areas.

Funding:

- Various sources of funding, including grants, and municipal funds

Potential Implementing Entities:

- Various town departments, as identified in the 2015 Hazard Mitigation Plan

Recommendation 3: Develop a formal plan to remove boats from the Harbor in anticipation of a storm.

The Town should conduct a needs assessment relative to the safe removal and storage of vessels in response to pending storm events. The assessment should consider factors such as the 1) number of vessels that would require removal and/or storage, 2) capacity of existing facilities to remove/store those vessels, 3) location of boat storage relative to floodplains and overhead obstructions, and 4) parties responsible for hauling boats. A formal plan should be developed based on this needs assessment, and the plan should address coordination/communication between responsible parties.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Department of Public Works
- Dartmouth Planning Department
- Dartmouth Harbormaster Department
- Local vessel haul-out companies
- Dartmouth Fire District 1
- Dartmouth Police Department

Recommendation 4: Ensure that the stormwater system is capable of accommodating current and projected weather conditions.

Regular maintenance and inspections of these systems will ensure that they are functioning properly. Also consider evaluating needed improvements in light of climate change projections for precipitation events.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Department of Public Works

Objective II: Continue to investigate, prepare for, and manage the local impacts of climate change-related flooding due to sea level rise and storm surge

Recommendation 5: Consider participating in the state’s Municipal Vulnerability Preparedness (MVP) program.

The MVP program provides the Town with an opportunity to consider the impacts of future hazards associated with climate change and develop and prioritize responses. Participation in the MVP program qualifies the Town to apply for specific grant funds to implement some of the actions identified during the MVP planning process.

Funding:

- MVP Program

Potential Implementing Entities:

- Dartmouth Planning Department
- Certified MVP provider(s)
- Other municipal departments, as appropriate

Recommendation 6: Consider public education measures to convey the risks associated with sea level rise and increased storm-related flooding and prepare community members to take actions to minimize the impacts.

The educational activities could include marking the expected sea level rise on buildings, roads, and signs; hosting public lectures or workshops on climate change impacts and storm preparation measures; and creating an online resource for residents who would like to know more about the local impacts of climate change and measures they should take to prepare for flooding and storm events.

Funding:

- Funding will depend on the measures taken, but could include grants, sponsorship, and donations

Potential Implementing Entities:

- Dartmouth Planning Department
- Dartmouth Police Department
- Community organizations

Recommendation 7: Review the Floodplain District and modify it, if needed, to address anticipated flooding.

Explore whether the district should be expanded, if language should be changed, and if requirements such as building elevations are adequate to reduce damage. As part of this, consider the new Flood Insurance Rate Maps (FIRMs) and maps of projected flooding.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Planning Department

Recommendation 8: Explore the creation of a regulation prohibiting new construction in high velocity zones.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Planning Department

Recommendation 9: Take measures to address vulnerable infrastructure in the areas anticipated to experience flooding.

These measures might include relocating the pump-house, ensuring that sewers can accommodate flooding events, ensuring that all storm drains in flood-prone areas are equipped with covers to prevent inundation, and flood-proofing infrastructure that cannot be moved. As part of this, conduct an inventory of infrastructure that is at risk, and determine appropriate response measures. Additionally, ensure that all new infrastructure—including docks and piers—is designed to withstand projected storm surge and flood levels.

Funding:

- State and federal grants

Potential Implementing Entities:

- Dartmouth Department of Public Works
- Dartmouth Planning Department

Recommendation 10: Review existing evacuation routes annually and make any revisions needed to reflect flooding associated with climate change and related sea level rise.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Department of Public Works
- Dartmouth Planning Department

Recommendation 11: Explore a barrier option for the Harbor to protect against storm surges.

Efforts should be made to determine whether or not a storm barrier across the entrance to the Harbor might reduce the impacts of storm surge both to harbor resources as well as upland areas. As part of this determination, the investigation should include a cost benefit analysis that addresses impacts of action/inaction on property values and property damage, natural resources, recreational uses, and economic activities.

Funding:

- State and federal grants

Potential Implementing Entities:

- Dartmouth Department of Public Works

- Dartmouth Waterways Management Commission
- Dartmouth Harbormaster Department

***Recommendation 12:** Evaluate the feasibility of acquiring land to connect West Smith Neck Road to Smith Neck Road to use during evacuations due to flooding conditions.*

The two roads are not presently connected, but such a connection might prevent people from having to travel on Smith Neck Road during flooded conditions.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Department of Public Works
- Dartmouth Planning Department

***Recommendation 13:** Prioritize protection of lands behind salt marshes to allow marsh migration landward with rising seas.*

As shown in Figure 15 in the Living Marine Resources section of Part 2 of this document, the area surrounding the Harbor includes significant marsh and wetland habitat. In addition to serving as important habitat, marshes also help mitigate flooding and can serve as a protection mechanism against the impacts of sea level rise and storm surge. The Town should identify those areas where marsh migration is possible and/or most beneficial and work to protect them from development through acquisition and other measures.

Funding:

- Grant funding could be sought for conducting a study of marsh migration potential
- Community Preservation Act funds and private gifts could be used for acquisitions

Potential Implementing Entities:

- Dartmouth Community Preservation Committee
- Dartmouth Conservation Commission
- Dartmouth Select Board
- Dartmouth Natural Resources Trust
- Buzzards Bay Coalition
- Consultants/researchers

Objective III: Understand the local impacts of and prepare for climate change-related flooding due to precipitation events

***Recommendation 14:** Conduct an analysis of potential inland and precipitation-related flooding as a result of projected changes in precipitation.*

The analysis should include modelling to identify impacts to infrastructure, vulnerable populations, and the environment. Additionally, the study should identify actions

necessary to minimize and/or mitigate impacts including safety issues, damage to infrastructure, water pollution, and consequences for natural resources.

Funding:

- Grant funding such as MCZM Coastal Resilience Grants

Implementing Entities

- Dartmouth Department of Public Works
- Buzzards Bay National Estuary Program
- Consultant for modeling and analysis

EMERGENCY RESPONSE

With the multitude of commercial and recreational uses, a coordinated response to emergencies on and near the Harbor is critical. Harbor-related emergencies can include relatively minor concerns such as a dinghy adrift, but can also entail more significant concerns such as an oil spill, a fatal boating accident, vessel fire, or a hurricane.

At the local level, emergencies in and around the Harbor are principally addressed by four entities:

1. Harbormaster Department
2. Fire Department District 1
3. Dartmouth Police Department
4. Lifeguard staff of the Parks and Recreation Department at Apponagansett Park.

Additionally, in unique, large, or particularly dangerous emergencies, various state (MA DEP, Massachusetts Emergency Management Agency, etc.) or federal (U.S. Coast Guard, NOAA Oil Spill Coordinators, etc.) agencies may be involved.

Though responders are all trained to address emergencies, their roles are not always clearly defined when they work collaboratively, nor do they have many opportunities to run joint training drills to ensure that chains of command are understood, that communication systems are compatible, or that people are familiar with all of the gear needed to safely address an emergency situation.

Improving emergency response is especially critical in storm situations, which are projected to intensify with climate change.

Issues

- Communication between emergency responders could be improved, both for planning purposes and for emergency responses.
- Limited opportunities exist for joint training between the Harbormaster's Department, the Fire District, the Police Department, Emergency Medical Services staff, and lifeguards. As such, there is the potential for a lack of understanding of operational hierarchies and capacities to respond to specific situations.
- As of the date of this document, staff of the Harbormaster's Department do not have materials for use when confronted with opiate issues, *e.g.*, narcan or naloxone.
- There is a need to ensure that resources are available to address safety concerns related to storm activity, such as hauling vessels and responding to flooded/damaged infrastructure.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Continue effective emergency response to incidences within or surrounding Padanaram Harbor and improve where feasible

Objective I: Clearly define individuals and/or departments responsible for oversight and initial response for various types of emergencies in and around the Harbor.

Recommendation 1: Clearly identify the Harbormaster as the initial point of contact and responder for boating-related emergencies.

All responders should initially work through the Harbormaster Department in instances of boating-related emergencies as that is where most of the appropriate equipment and staff is located. When necessary, additional resources can be called upon from the Dartmouth Fire District 1 and/or the Dartmouth Police Department.

Funding:

- Existing departmental funding provided by the Waterways Enterprise Fund

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Fire District 1
- Dartmouth Police Department

Recommendation 2: Identify an Oil Spill Coordinator for the Town from existing staff. The Oil Spill Coordinator should be qualified through appropriate training.

Petroleum spills involve a variety of potential responders depending on the nature and

source of the spill. The Harbormaster is often the initial entity made aware of a petroleum spill in the Harbor. The Dartmouth Fire District 1 holds and maintains a trailer of equipment to contain and disperse petroleum spills. The staff of the Environmental Affairs Office generally provides liaison with the state Department of Environmental Protection in instances of petroleum spills and the Board of Health may become involved if the petroleum has the potential to affect human activities such as swimming. Presently it is unclear who, within the town staff, has the authority and responsibility to coordinate response to petroleum spills. This role may be divided among various entities depending on whether the spill occurs on land, in freshwater bodies, or in coastal waters. The person selected to fill this role should have all appropriate training and other suitable qualifications for the position.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- The appointment should be made through the Select Board

***Recommendation 3:** Clarify the roles and authorities between the Dartmouth Police Department, the Harbormaster Department, and the Shellfish Constable(s) in response to illegal activities in and around the Harbor.*

The Dartmouth Police Department has the authority to detain and arrest individuals suspected of criminal acts—both on land and on the water. Harbormasters and Assistant Harbormasters have similar authorities under the provisions of Chapters 90B, 91, and 131, §87 of Massachusetts General Laws. These legal authorities of the Harbormaster and Assistant Harbormasters do not seem to be clearly understood both within town government and by the general public. These authorities should be better publicized on town websites and through other mechanisms.

Funding:

- No additional funding is needed to implement this recommendation

Potential Implementing Entities:

- Select Board
- Dartmouth Waterways Management Commission
- Harbormaster Department

Objective II: Maintain staff training and appropriate equipment to respond to emergencies.

***Recommendation 4:** Ensure that staff and equipment are capable of meaningful response to the wide range of potential emergencies through regularly scheduled joint training exercises.*

Emergency training involving various types of emergencies is critical to ensure effective and efficient response when a real situation occurs. In the past, there have been joint training exercises including the Harbormaster, life guards from Apponagansett Park, the Dartmouth Police Department, and the Dartmouth Fire District 1. Additionally, in the spring of 2018, oil spill response training with the appropriate departments was

conducted by Nuka Research and funded by the MA DEP. Such training should continue as staff, location of equipment, and the nature of potential emergencies change over time.

Funding:

- Most training can be done through existing departmental budgets. Where there is need for specialized training, such programs—or funding for such programs—may be available through the MA DEP, the U.S. EPA, Harbormaster Associations, or similar groups

Potential Implementing Entities:

- The Dartmouth Harbormaster Department should be responsible for determining when such training is necessary and coordinating the development of such efforts

Objective III: Ensure that communication equipment and procedures between first responders is fully compatible and suitable for the tasks necessary.

Recommendation 5: Establish a clear protocol for communication between entities responsible for emergency response including definition of lead entity, defined means of communication and contact, and acquiring and maintaining compatible communication equipment to ensure that contacts can be made in a timely manner.

Potential responders need a clear understanding as to who to contact for emergency response and how to make initial contact. This requires appropriate equipment (e.g., phone, radio, etc.) and contact information (e.g., phone numbers, radio channels, etc.) for establishing communication on either land or water.

Funding:

- No additional funds are needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Select Board
- Dartmouth Harbormaster Department
- Dartmouth Fire District 1
- Dartmouth Police Department

Objective IV: Ensure that staff of the various departments are suitably trained in communication procedures for effective and timely transmission of information.

Recommendation 6: Maintain regularly scheduled joint training exercises with the appropriate staff to practice responses to various types of simulated emergencies.

Once a clear protocol for communication has been established, it should be tested on a regular basis to ensure that equipment remains compatible and staff of the various

departments understand the appropriate contact individuals and mechanisms.

Funding:

- No additional funds are needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Select Board
- Dartmouth Harbormaster Department
- Dartmouth Fire District 1
- Dartmouth Police Department
- Dartmouth Parks and Recreation Department

Objective V: Ensure that staff members of the departments with emergency response roles and capabilities understand the operation of lead agencies in various types of emergencies.

***Recommendation 7:** Establish clear protocols for response to various types of emergencies including lead entity, other entities to be notified and/or involved, and mechanisms to ensure communication and coordination.*

Clear protocols for response to various types of emergencies should be developed jointly among potential responders and disseminated to all entities and agencies that might be involved.

Funding:

- No additional funds are needed to implement this recommendation

Potential Implementing Entities:

- Dartmouth Select Board
- Dartmouth Harbormaster Department
- Dartmouth Fire District 1
- Dartmouth Police Department
- Dartmouth Parks and Recreation Department

Objective VI: Incorporate the realities of sea level rise when planning emergency response in the face of significant storm events.

***Recommendation 8:** As part of long-term emergency planning, incorporate projections of sea level rise as an element of hauling and removing vessels from the Harbor in the face of storm events.*

As sea levels rise, there will be a need to periodically recalculate the techniques to haul boats on an emergency basis and remove them from areas subject to storm surge and/or flooding. (See sections on Commercial Uses and Flooding and Sea Level Rise for more information.)

Funding:

- Existing departmental budgets

Potential Implementing Entities:

- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission
- Dartmouth Planning Department
- Dartmouth Department of Public Works
- Maritime businesses within the harbor area

TRANSPORTATION

Transportation-related topics have been widely discussed, and have been controversial within the Harbor planning area for many years. Vehicular and pedestrian movement around and across the Harbor and limited parking in the Village at popular public access sites comprise some of the issues identified. Divergent opinions exist as to whether Padanaram Village should be a quiet, residential area with limited traffic and parking or a destination spot for shopping, business, public access to the waterfront, and tourism.

Padanaram Harbor is somewhat distinctive in that it is bisected by the causeway and bridge. The causeway was recently refurbished and upgraded, but the construction work caused significant disruption of normal traffic patterns and, reportedly, economic impacts within Padanaram. The bridge is in need of ongoing repairs and potential replacement. Preliminary cost estimates for a new structure run between \$10–\$20 million, depending on design. Construction work for a replacement bridge could lead to disruption of traffic and impacts to the Village similar to that resulting from the causeway construction, again depending on design and construction methods.”¹¹ .

In addition to landside transportation challenges, boaters on moorings in the Harbor face the question of how to get to and from their vessels. Most utilize dinghies, but dinghy storage around the Harbor can be expensive and difficult to find. The New Bedford Yacht Club operates a launch service to transport members to their boats, but there is presently no commercial launch service operating in the Harbor.

Issues

- Closure of either the causeway or the bridge has led (in the case of the causeway) and could lead in the future (in the case of bridge construction) to significant disruption in traffic patterns and on activities in, and the economy of, Padanaram Village.
- Bridge repair work could adversely impact passage to and from the north portion of the Harbor by boaters.
- Dinghy storage is limited and can be expensive, and there is no public launch service.

¹¹ Dave Hickox., Dartmouth Director of Public Works, 2018. Pers. comm.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Maintain and improve operability of the Padanaram Bridge for both vehicular and boating traffic

Objective I: Provide necessary repairs to the existing bridge as quickly as possible while minimizing disruption of vehicular and boating traffic.

***Recommendation 1:** Make every attempt to minimize disruption of traffic, both automotive and boating, while short-term repairs are being made to the base, electrical system and other parts of the swing bridge.*

The recent closure of the causeway demonstrated the disruption, real or perceived, of traffic flow between Padanaram Village and areas to the west. While additional work is necessary to maintain the moving portion of the bridge, efforts should be made to avoid further disruption of vehicular traffic. Additionally, a significant number of vessels moored or launched north of the bridge require the bridge to open in order to access open water. As such, similar efforts should be made to avoid disruption of boating traffic.

Funding:

- Existing funding for bridge repair

Potential Implementing Entities:

- Dartmouth Department of Public Works

Objective II: Make all necessary preparations for the construction of a new bridge once funding becomes available.

***Recommendation 2:** Prepare design specifications and cost estimates for construction of a new bridge to replace the current swing structure.*

Funding for the replacement of the existing swing bridge has been a low priority for the Massachusetts Department of Transportation (DOT) funding process. The Padanaram Bridge has a lower volume of traffic than many other urban, suburban, or rural bridges in need of repair and replacement. However, from time to time, a scheduled project on the priority listing is cancelled or postponed, creating available funding. Having designs and cost estimates “shovel ready” might provide an opportunity for the Padanaram Bridge to move up on the priority list.

Funding:

- As available through the Dartmouth Department of Public Works or grant funding

Potential Implementing Entities:

- Dartmouth Department of Public Works

***Recommendation 3:** Continue to seek funding for reconstruction of the Padanaram Bridge.*

It is unlikely that the Town will be able to fund the estimated \$10+ million cost to replace the bridge, so outside funding will need to be sought. The Town should continue efforts to locate, and advocate for, funding.

Funding:

- Departmental budget of the Dartmouth Department of Public Works

Potential Implementing Entities:

- Department of Public Works

Goal II: In designing and implementing revisions to roadways and other infrastructure in the vicinity of the Harbor, ensure safe and efficient movement of large vehicles hauling boats

Objective I: Consider the needs of boat hauling operations when designing and upgrading streets and sidewalks in Padanaram Village and on the west side of the Harbor.

***Recommendation 4:** Design roadway and sidewalk modifications within Padanaram Village, westerly on Gulf Road, and southerly on Smith Neck Road to allow for transport of boats that have been hauled from the Harbor or are in transit to be launched into the Harbor.*

Annually, sizable vessels are hauled and/or launched at the Arthur Dias Town Landing or several other sites along the Harbor. These are transported, through the Village or along Gulf Road, to/from off-site seasonal storage areas. These activities require sizable trucks and trailers for hauling—vehicles that must navigate the streets and traffic within the Village, west along Gulf Road or south along Smith Neck Road. Narrow roads, placement of sidewalks or other roadway designs may hamper safe and efficient movement. This may become especially critical during significant storm events when boats are being hauled and relocated on an emergency basis. Further, as sea levels rise, bringing the

potential for flooding, portions of Gulf Road, Smith Neck Road and the causeway itself may be subject to flooding, precluding safe removal of boats.

Funding:

- From design funds for roadway and sidewalk projects

Potential Implementing Entities:

- Dartmouth Department of Public Works

Recommendation 5: When reconstructing or modifying the location of roadways within the Harbor area, make every attempt to include pedestrian sidewalks and bicycle lanes.

Addition of sidewalks and bicycle lanes encourage pedestrian and non-vehicular use of the roadways, lessening traffic congestion and pressure on parking resources. They also provide a healthful means of accessing and visually experiencing the Harbor..

Funding:

- From design funds for roadway and sidewalk projects

Potential Implementing Entities:

- Dartmouth Department of Public Works

Goal III: Improve water transportation within the Harbor to facilitate movement to and from moored or anchored vessels

Objective I: Work to establish water transportation within the Harbor.

Recommendation 6: Seek to identify a vendor and shoreside facilities—including dockage and parking—to allow for water transportation to and from moored or anchored vessels.

This will require a boat, or boats, suitable for carrying passengers and gear from a shoreside facility to or from vessels. This might be from an existing commercial marine facility, the Arthur Dias Town Landing, or from the new Maritime Center. The role of the Town would be to help encourage and facilitate such an operation but not to be the operator of such a business.

Funding:

- Private business

Potential Implementing Entities:

- Commercial marine businesses
- Dartmouth Harbormaster Department
- Dartmouth Waterways Management Commission

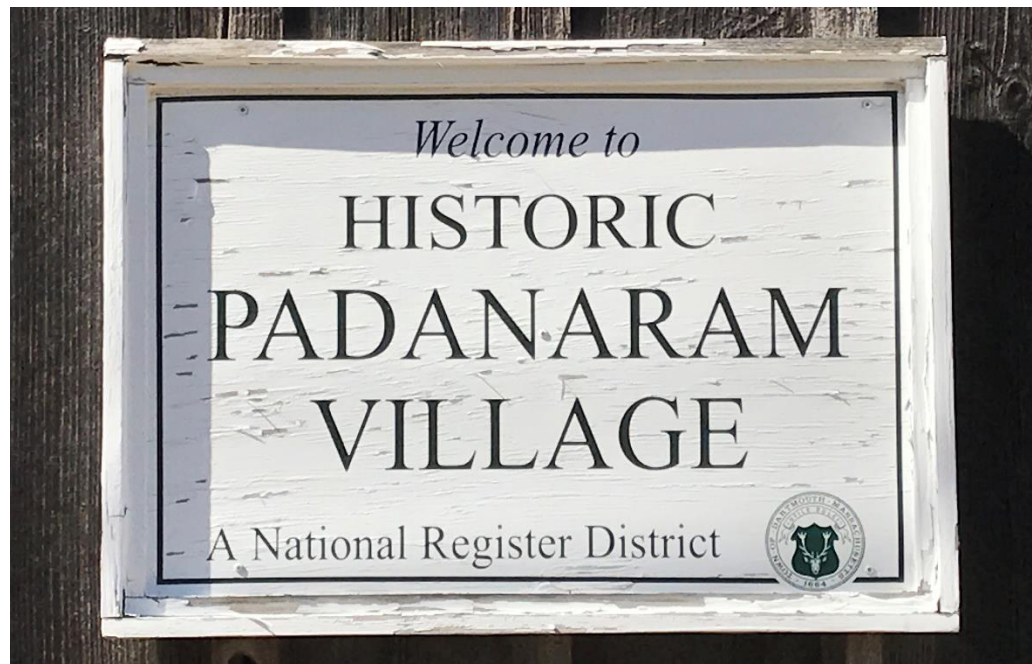
HISTORICAL AND CULTURAL FEATURES

The historical and cultural resources of Padanaram Harbor and the Village extend back some 10,000 years to the original indigenous inhabitants. The present design and nature of the area speak to the town's early settlement by English colonists from the Plymouth Colony in the 1600s and its maritime history steeped in whaling-related activities, salt production, military activity, and ship building. The Town works diligently to protect the historical feel and the sea-side culture of areas like Padanaram Village through zoning, its Master Plan, and other means, yet there are opportunities to better educate and promote the history of the Harbor through walking tours, brochures and maps, curated exhibits, and other activities/resources.

Issues

During interviews, public meetings and an initial survey conducted as part of the Harbor Plan outreach process, several management-related issues emerged, including:

- There is a divide between people in the community who are aware of, and have an interest in protecting, the historical/cultural resources of the area, and those who are unaware of the history and cultural context of the Harbor and its surroundings. This lack of awareness suggests a need for greater outreach and education on the topic.
- There are a number of historic photographs, paintings, and other artifacts pertaining to the history of the Harbor and its surroundings that are held or displayed in various locations ranging from libraries to the Town Hall. There presently is no single location for their display nor is there a guide to where these materials are to be found.
- There is the potential for archaeological and historic resources to be lost through building demolition, renovations, and new construction.



GOALS, OBJECTIVES, AND RECOMMENDATIONS

Goal I: Protect the historical and cultural resources of Padanaram Harbor and the surrounding area

Objective I: Improve mechanisms to protect historical and cultural resources through regulatory, funding, and incentive-based programs.

Recommendation 1: Continue to implement the options for protection of historical and cultural resources outlined in the Town of Dartmouth 2007 Master Plan.

The Town of Dartmouth 2007 Master Plan details a number of methods recommended for the protection and preservation of historical and cultural resources town-wide. These are found in Goal 2, Objective 2c and read as follows:

- Use acquisition or eminent domain as a means to secure historic properties that would otherwise be destroyed and resell for rehabilitation with aid from the Community Preservation Act.
- Provide grants or low-interest loans to businesses to preserve historic facades or restore historic signage.
- Explore Village Center Zoning and design standards to preserve historic village character in Padanaram.
- Draft a Demolition Delay By-law to provide a window for action to conserve historic structures [The Demolition Delay By-law was passed in 2003 and is administered by the Dartmouth Historical Commission.]
- Create a special permit requirement for sites that lie in Archaeologically Sensitive Areas as described in the Public Archaeology Laboratory (PAL) survey
- Explore the creation of a special permit requirement for structures on the Massachusetts Historical Register
- Explore financial incentives such as tax credits, for accurate preservation of historic sites.

Other elements are found in Goal 6, Objective 6a, and read as follows:

- Develop regulations to protect scenic landscapes within the Town (example, Scenic Vista Protection by-law)
- Provide grants or low-interest loans for restoration of stone walls and other significant structures on scenic roads.
- Work with the Planning Board to develop programs/incentives that would encourage developers to preserve old farmhouses in new housing developments on farmland.

While some of these have been implemented, either in whole or in part, each should be re-evaluated for implementation.

Funding:

- Community Preservation Funds
- Departmental budgets

- State grant funding
- Town Meeting action

Potential Implementing Entities:

- Dartmouth Historical Commission
- Dartmouth Planning Department and Planning Board
- Dartmouth Community Preservation Committee

Objective II: Improve community understanding of the nature and value of the historical and cultural resources of the area, not only for their important intrinsic values, but also as a context for current and future development decisions.

***Recommendation 2:** Prepare outreach materials identifying the significant historical and cultural sites in and around the Harbor and disseminate these to residents and guests to the community.*

Both the Dartmouth Historical Commission and the New Bedford Yacht Club have, in the past, prepared pamphlets describing and locating historical and cultural sites in and around Padanaram Village. These are no longer in print. Similar materials, whether in print, a web site, or an app that could be utilized on electronic devices could be developed and disseminated widely.

Funding:

- Departmental funds
- Padanaram Business Association
- New Bedford Yacht Club
- Community Preservation Funds
- Southeastern Massachusetts Visitors Bureau

Potential Implementing Entities:

- Dartmouth Historical Commission
- Padanaram Business Association
- New Bedford Yacht Club
- Southeastern Massachusetts Visitors Bureau

Objective III: Ensure that cultural and historic values are incorporated into land use and, where appropriate, water use planning, management, and regulatory activities.

***Recommendation 3:** Continue to implement items identified in the Town of Dartmouth 2007 Master Plan, including the following specific items:*

- Explore Village Center zoning and design standards to preserve historic village character in Padanaram.
- Create a special permit requirement for sites that lie in Archaeologically Sensitive Areas as described in the PAL survey of the Town.
- Explore the creation of a special permit requirement for structures on the Massachusetts Historical Register.

- Explore financial incentives such as tax credits, for accurate preservation of historic sites.

The items listed above should be re-evaluated for implementation as per the Town of Dartmouth 2007 Master Plan.

Funding:

- Departmental budgets
- Community Preservation Funds
- Town Meeting budget action

Potential Implementing Entities:

- Dartmouth Historical Commission
- Dartmouth Planning Department
- Dartmouth Planning Board
- Dartmouth Town Meeting

PART TWO: BACKGROUND MATERIAL

The material presented in this section of the Harbor Plan provides background information on the key topics for Padanaram Harbor, as identified through the harbor planning process, *e.g.*, public meetings, Advisory Committee input, research. More specifically, the contents of this section describe existing conditions, explain issues relative to each topic, and provide the context needed to more fully understand the need for/context around the recommendations in Section One.

Section 2.1 Current Management Structure for the Harbor

Presently management of activities related to the Harbor and surrounding lands occurs through a network of local, state, regional, and federal entities. Each of these has a distinct jurisdiction regarding types of activities and geographic scope. It should be noted that there is no single entity with responsibility for “harbor management” nor is there currently any clear mechanism for ensuring coordination among and between the various groups.

The following is a brief summary of the various entities and their authorities. These will be discussed in greater detail later in this document.

Local Management Agencies

Select Board:

The five-member Select Board generally oversees the operations of town government including making policy, reviewing budgets, setting fees, and enacting rules and regulations. They are assisted in these efforts by the Town Administrator.

Town Meeting:

The 320+ elected representatives at scheduled Town Meetings vote to set salaries for elected officials, to appropriate funds to run the Town and adopt or modify local statutes called by-laws.¹²

Waterways Department:

This Department consists of the Harbormaster and his staff. They have a varied number of responsibilities within the harbor area, including:

- Responsibility for assignment and safe maintenance of the approximately 1200 moorings within town waters,
- Response to emergencies on the water both within the Harbor and throughout Buzzards Bay through the U.S. Coast Guard Buzzards Bay Task Force,
- Ensuring safe and responsible public use of the harbor’s waters by enforcing local, state, and federal rules and regulations,

¹² Commonwealth of Massachusetts, Secretary of State web page: Citizen’s Guide to Town Meetings www.sec.state.ma.us/cis/cistwn/twnidx.htm

- Operating the town waste pump-out boat to serve moored or anchored vessels in conformance with the “No Discharge” designation of all Dartmouth waters, and
- Managing the Arthur F. Dias Public Boat Launch Facility at Apponagansett Point.

Presently, the Harbormaster also serves as the Shellfish Constable. Work related to shellfish is not funded through the Enterprise Fund that supports the Harbormaster Department. Efforts related to shellfish management are funded through the town’s general fund—shellfish license fees, fines and any other receipts from shellfish/natural resource activities are directed to the general fund, from which funding for shellfish activities are budgeted. The Shellfish Constable has several roles, including:

- Enforcement of local and state shellfish regulations,
- Development and administration of regulations for aquaculture efforts within the town’s waters,
- Propagation of shellfish within the Harbor, and
- Public education and outreach regarding shellfish and harvesting.

Waterways Management Commission:

The seven volunteer members of the Waterways Management Commission are appointed by the Select Board. The Waterways Management Commission was established via by-law in 2003 to “establish policies and promulgate rules regarding the tidal waterways and related public facilities within the Town...” The Commission advises the Harbormaster and the Town regarding policies and regulations for use of the town’s waterways.

Conservation Commission:

The two most visible roles of the Conservation Commission and its staff are wetlands protection and open space management. The Commission administers both the Massachusetts Wetlands Protection Act and the Dartmouth Wetlands Protection By-law. In its open space protection role, the Commission holds several parcels within the Harbor planning area:

- Parcels flanking Star of the Sea Drive,
- A sizable parcel at the upper end of Dike Creek between Gulf Road and Rock O Dundee Road, and
- Two waterfront parcels to the east of Smith Neck Road south of the intersection with Gulf Road as it leads onto the causeway.

In addition, the Commission holds conservation easements on a few parcels within the planning area.

Furthering the above activities, staff of the Commission have been involved in the coordination of salt marsh restoration projects and administration of the town’s Geographic Information System (GIS).

Planning Board/Planning Department:

This Department oversees land use through zoning and site-plan reviews, long-term planning efforts, and economic development. The Planning Board also coordinates comments on behalf of the Town on applications for projects within Padanaram Harbor under the provisions of the Massachusetts Public Waterfront Act/Chapter 91.

Department of Public Works:

The Department of Public Works (DPW) has principle oversight over the design and implementation of a wide range of transportation-related and other infrastructure projects. The most visible within the Padanaram Harbor planning area is the renovation of the Padanaram causeway and maintenance and operation of the Padanaram Bridge. Other projects include roadway maintenance and improvements and sidewalks in and around Padanaram Village. The DWP also is responsible for infrastructure related to management of sewer and stormwater projects.

Parks and Recreation Board and Department:

The Parks and Recreation Department operates the Apponagansett Park fronting on the upper Harbor. This facility includes a bathing beach, food concession, playground and various sport areas. The Park hosts evening concerts in season and various other recreational programs and activities. Park lifeguards are trained in preliminary first aid and water rescue methods.

District 1 Fire Department:

District 1 responds to fire and rescue needs in and around the Harbor. The District owns and operates a 32-foot fire boat that is in the water generally from May–November. They have the capacity to fight fires from either the land or water. Additionally, District 1 participates in the regional Buzzards Bay Marine Task Force for emergency response.

Police Department:

The Police Department responds to reports of violations of law on and around the waters of the Harbor. It includes a marine unit with a 25-foot boat stored on land at the current police facility. Some members participate on the regional dive team for emergency response.

Pathways Committee:

The Dartmouth Pathways Committee was established to improve bicycle and pedestrian infrastructure within the Town. The Committee has developed and advocated for a concept design to increase public access along the shorelines of the southern portion of Harbor, including a walkway along Smith Neck Road and, taking advantage of access through filled tideland areas under the provisions of the state Public Waterfront Act/Chapter 91, on the east side of the Harbor.

Historical Commission:

The Historical Commission was established to focus on the preservation, protection and development of the town’s historical and archaeological assets, for historic preservation planning for the Town, and advising the Select Board on historical matters.¹³

The Commission has been involved in identifying and inventorying historic and pre-historic sites within the Town and maintaining records as to their nature and status. A significant number of such sites have been recorded within the Harbor planning area.

State Management Agencies

Massachusetts Department of Environmental Protection:

The Department of Environmental Protection (MA DEP) works at the state level to protect natural resources, prevent pollution, promote waste disposal and recycling, and

¹³ Town of Dartmouth Annual Report 2016, p.82.

address contamination cleanup. More specifically, the MA DEP oversees administration of the Massachusetts Wetlands Protection Act—hearing appeals of local Conservation Commission decisions, providing training, and developing policies and regulations. The MA DEP also issues licenses under the provisions of the Public Waterfront Act/Chapter 91; creates stormwater management policy and assists communities with compliance under the MS4 program, supports communities with local contamination issues, assists communities with dredging projects, and offers training on topics such as oil spill response. The Division of Water Pollution Control within the MA DEP enhances water quality and the value of water resources and minimizes water pollution through activities such as adopting standards of minimum water quality and certifying wastewater treatment facilities and sewer systems.

Massachusetts Division of Marine Fisheries:

The Division of Marine Fisheries (DMF) is engaged in fisheries and shellfisheries management, including activities such as gathering fishing data (*e.g.*, landing reports); managing shellfish sanitation; and ensuring that habitats are protected, restored, and understood.

Massachusetts Office of Coastal Zone Management:

The Office of Coastal Zone Management (MCZM) is the state’s ocean and coastal planning and policy development agency with jurisdiction over land and water from the seaward limit of the state’s territorial sea to generally 100 feet landward of the first land transportation route. MCZM assists communities with coastal planning issues such as climate change impacts and coastal development, providing regulatory guidance, technical expertise, and mapping resources. MCZM also administers the Buzzards Bay National Estuary Program, an entity funded by the Environmental Protection Agency that focuses on the improvement of water quality within the watersheds and waterbodies draining to Buzzards Bay.

Federal Management Agencies

Federal Emergency Management Agency:

The Federal Emergency Management Agency (FEMA) helps communities prepare for, protect against, respond to, and recover from/mitigate hazards ranging from fires to storms to earthquakes.

One of the agency’s major initiatives relative to coastal communities is the National Flood Insurance Program (NFIP) and the Flood Insurance Rate Maps (FIRMs), which are the official maps on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. These maps are utilized for institution of flood insurance rates and associated regulations.

National Oceanic and Atmospheric Administration:

The National Oceanic and Atmospheric Administration (NOAA) plays an active role in the fisheries management and provides important tools for weather and storm predictions as well as climate change preparedness. NOAA’s Office for Coastal Management provides resources for understanding and communicating local impacts such as their sea level rise mapping and visualization tools; and NOAA offers competitive funding opportunities for coastal communities to increase their resiliency.

U.S. Environmental Protection Agency:

The Environmental Protection Agency (U.S. EPA) is authorized under the Clean Water Act to reduce point and non-point water pollution through the National Pollutant Discharge Elimination System (NPDES) program. Additionally, the U.S. EPA works with states to identify nitrogen and/or phosphorus-impaired waterbodies, such as Padanaram Harbor, and develop Total Maximum Daily Loads (TMDLs) to restore and protect water quality. The U.S. EPA also provides funding and oversight for the Buzzards Bay Program.

U.S. Army Corps of Engineers:

The Corps of Engineers regulates work and structures located in, under, or over navigable waters (including adjacent wetlands) of the United States under Section 10 of the Rivers and Harbors Act of 1899; the discharge of dredged or fill material into waters of the United States under Section 404 of the Clean Water Act; and the transportation of dredged material for the purpose of disposal in the ocean under Section 103 of the Marine Protection, Research and Sanctuaries Act. Further, it licenses a significant commercial mooring field within Padanaram Harbor.

U.S. Coast Guard:

The Coast Guard provides rescue capabilities within Buzzards Bay and establishes regulations for structures that impede travel and transportation on coastal waters such as the Padanaram Bridge.

Section 2.2 Existing Laws, By-laws, Regulations and Administrative Policies for Management of the Harbor

TOWN OF DARTMOUTH BY-LAWS AND REGULATIONS

Waterways:

The town's waterways are governed by the Waterways Management Rules and Mooring Regulations,¹⁴ which can be found on the Harbormaster's website.¹⁵

Shellfish and Aquaculture:

Shellfishing within town waters is overseen by the Shellfish Constable, with the Harbormaster serving part-time as the Shellfish Constable. Current regulations¹⁶ and areas open for recreational shellfishing¹⁷ may be found on the Department's web site.¹⁸

Private aquaculture licenses may be issued as a complement or supplement to traditional harvest fisheries in accordance with the town's aquaculture regulations.¹⁹ These regulations, including locations available for aquaculture activities, may be found on the Department's web site.²⁰

Zoning:

The town's Zoning By-laws²¹ and subsequent regulations address several topics relevant to harbor management including the following:

- *Maritime Industrial Districts*²² (Section 13 of the Zoning By-laws) set aside areas limited to activities related to marine industries such as boat building, repair and storage; support activities such as sail-making, and, sales; and research labs for product development. There is a Maritime Industrial District on the south side of Gulf Road which includes the current Concordia Company.

¹⁴ Town of Dartmouth. Dartmouth Harbormaster. Rules and Regulations. Online at: <http://www.dartmouthharbormaster.com/rulesandregs>

¹⁵ Town of Dartmouth. Dartmouth Harbormaster. Online at: <http://www.dartmouthharbormaster.com/>

¹⁶ Town of Dartmouth. Dartmouth Shellfishing Abstract. Online at: <https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/2017shellfishabstract.pdf>

¹⁷ Town of Dartmouth. Open Shellfishing Areas. Online at: https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/shellfish_map.pdf

¹⁸ Town of Dartmouth. Shellfish & Aquaculture Regulations. Online at: <https://www.town.dartmouth.ma.us/select-board/pages/shellfish-aquaculture-regulations>

¹⁹ Town of Dartmouth. Dartmouth Aquaculture Regulations. Online at: www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/aquaculture_regulations.pdf.

²⁰ Town of Dartmouth. Shellfish & Aquaculture Regulations. Online at: <https://www.town.dartmouth.ma.us/select-board/pages/shellfish-aquaculture-regulations>

²¹ Town of Dartmouth. Zoning Bylaws. Online at: <https://www.town.dartmouth.ma.us/town-clerk/pages/zoning-laws>

²² Town of Dartmouth. Zoning Bylaws: Section 13 Maritime Industrial Districts. Online at: <https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/z13.pdf>

- The *Village Business District*²³ in Padanaram is designed allow mixed use “encompassing local businesses, civic institutions, and compact residential development. Development within such Districts shall be pedestrian oriented and enhance the pedestrian experience.” Provisions allow for shoreside facilities associated with aquaculture, yacht and beach clubs, boat repair, and other businesses related to harbor activities. A special permit from the Planning Board is required for the processing of shellfish, fish, or marine products.
- Other than the above, the rest of the Harbor planning area is zoned either for Single Residence B (the west side of the Harbor) or General Residence (the east side of the Harbor).

Wetlands Protection:

As noted above, the Conservation Commission administers both the Massachusetts Wetlands Protection Act (MGL 131 §40) as well as the Town of Dartmouth Wetlands Protection By-law.²⁴

The former protects a series of specific state-wide interests within waterbodies, associated wetlands, beaches, flood plains, and lands within 100 feet of those areas. Protected interests related to the Harbor include:

- Storm damage
- Flood control
- Protection of marine fisheries
- Protection of land containing shellfish
- Protection of wildlife habitat
- Prevention of pollution

The Dartmouth Wetlands Protection By-law protects the above interests and adds the following local interests:

- Erosion and sedimentation control
- Recreation, and
- Aesthetics.

COMMONWEALTH OF MASSACHUSETTS LAWS AND REGULATIONS

MGL Chapter 91 and the Massachusetts Waterways Regulations:

Chapter 91, Massachusetts' principal waterfront regulatory program in tidelands and other waterways, and the corresponding Waterways Regulations (310 CMR 9.00) are administered by the Division of Wetlands and Waterways of the Massachusetts Department of Environmental Protection (MA DEP). Chapter 91 applies to all of the tidelands within Padanaram Harbor. Tidelands are those lands presently—or formerly—beneath the waters of the ocean, including lands that are always submerged as well as

²³ Town of Dartmouth. Zoning Bylaws: Section 375-15

²⁴ Town of Dartmouth. Wetlands Protection Bylaw and Wetlands Protection Regulations. Online at:

www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/wetlands_protection_bylaw_and_wetlands_protection_regulations_revised_august_25_2015.pdf

those in the intertidal area, *i.e.*, between the mean high and low water marks. This area is governed by the “public trust doctrine” which establishes that all rights in tidelands and the water are held by the state “in trust” for the benefit of the public. Lands in current or filled intertidal areas, while under private ownership, retain certain public rights, including access for the purposes of fishing, fowling, and navigation. The Waterways Act and its corresponding regulations codify the public trust doctrine in Massachusetts.

As clarified by the 1983 amendments to the DEP waterways regulations, Chapter 91 jurisdiction extends landward to the historic high water line and seaward three miles to the limit of state jurisdiction. The historic high water line is the farthest landward tide line which existed “prior to human alteration” by filling, dredging, impoundment or other means (310 CMR 9.02). Thus, Chapter 91 applies to filled as well as flowed tidelands. Chapter 91 authorization is generally required for any fill, structure, or use not previously authorized in tidelands, including any changes of use and structural alterations. Types of structures include: piers, wharves, floats, retaining walls, revetments, pilings, bridges, dams, and waterfront buildings (if located on filled lands or over the water). For planning purposes, the location of the historic high water line (*i.e.*, upland limits of Chapter 91 jurisdiction) must be established through a review of maps that may reliably show the original natural shoreline or through engineering studies. Previously-issued Chapter 91 licenses are also a source of information on the historic high tide line for specific parcels.

Wetlands Protection Act:

This act “protects wetlands and the public interests they serve, including flood control, prevention of pollution and storm damage, and protection of public and private water supplies, groundwater supply, fisheries, land containing shellfish, and wildlife habitat.”²⁵

MGL Chapter 21, Section 27:

Chapter 21 establishes the duties and responsibilities of the Division of Water Pollution Control within the MA DEP, which are to: enhance the quality and value of water resources and to establish a program for prevention, control, and abatement of water pollution. The Division of Water Pollution Control is responsible for setting surface water quality standards and for issuing permits for activities including surface water and groundwater discharge, and sewer extensions and connections, as described in 314 CMR.

Water Quality Certification:

These regulations “implement Section 401 of the federal Clean Water Act in Massachusetts by establishing permitting requirements to ensure that dredging projects, or proposed discharges of dredged or fill material, protect the public health and the Commonwealth’s water resources.”²⁶

²⁵ <http://www.mass.gov/eea/agencies/massdep/water/watersheds/protecting-wetlands-in-massachusetts.html>

²⁶ <http://www.mass.gov/eea/agencies/massdep/water/regulations/314-cmr-9-00-401-water-quality-certifications.html>

FEDERAL LAWS AND REGULATIONS

Clean Water Act:

Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to regulate the discharge of dredged or fill material into "waters of the United States" as described above. Regulated activities include the placement of fill for construction, site-development fill, riprap, seawalls, and beach nourishment.

Section 401 of the Clean Water Act gives states the authority, through a certification process, to ensure that federal permits are not issued in violation of state water quality standards. Within the Code of Massachusetts Regulations (314 CMR 9.00) the state's Water Quality Certification Regulations implement Section 410 of the Clean Water Act "by establishing permitting requirements to ensure that dredging projects, or proposed discharges of dredged or fill material, protect the public health of the Commonwealth's water resources"²⁷.

Also, under authorization of the Clean Water Act, the U.S. EPA issues permits to all municipal, industrial, and commercial facilities that discharge wastewater directly from a point source into a receiving body as part of the National Pollutant Discharge Elimination System (NPDES) program.

Furthermore, the EPA's National Pollution Discharge Elimination System (NPDES) Stormwater program seeks to preserve and protect water quality by regulating discharges from municipal separate storm sewer systems (MS4s), construction and industrial activities, and other sources as designated by the U.S. EPA.

Rivers and Harbors Act of 1899:

Section 10 of the Rivers and Harbors Act of 1899 authorizes the U.S. Army Corps of Engineers to regulate structures and other modifications of navigable waters of the United States. Jurisdiction extends shoreward to the mean high water line in tidal waters, and to the ordinary high water line in non-tidal waters (fresh water). Regulated activities include construction of piers and wharves, permanent mooring structures such as pilings, intake and outfall pipes, boat ramps, beach nourishment, and dredging and disposal of dredged material, excavation, and filling.

The Army Corps' other major responsibility is to plan and carry out water resources projects such as improvements to navigation. As of 1986, the cost for such projects is shared between the federal government and the non-federal sponsors. An important consideration in the Corps' decision to undertake a project is that its benefits must exceed the cost. For projects such as dredging of harbors and navigation channels, highest priority goes to projects that benefit maritime industry, such as shipping and fishing.

U.S. Coast Guard Authority Regarding Bridges:

Under the provisions of 33 CFR (Code of Federal Regulations) 116.01, "all bridges are obstructions to navigation and are tolerated only as long as they serve the needs of land transportation while allowing for the reasonable needs of navigation."²⁸ This provision

²⁷ 314 CMR 9.00: 410 Water Quality Certifications. Online at: <http://www.mass.gov/eea/agencies/massdep/water/regulations/314-cmr-9-00-401-water-quality-certifications.html>

²⁸ www.law.cornell.edu/cfr/text/33/116.01

of federal law and supporting regulation forms the basis for the scheduled openings of the Padanaram Bridge. The language of 33 CFR 117.587²⁹ establishes the opening schedule for the “Padanaram Bridge” on the “Apponagansett River.” It further mandates that “... [t]he owners of the bridge shall provide and maintain mooring facilities for vessels to make fast while waiting for the bridge to open.”

²⁹ www.law.cornell.edu/cfr/text/33/117.587

Section 2.3 Summary of Existing Planning Documents and Policies Related to Harbor Management.

Previous planning efforts address many topics that relate to management of the Harbor—although in most cases the Harbor is not explicitly mentioned. These include the Town Master Plan, the Open Space and Recreation Plan, and the Local Multi-Hazard Mitigation Plan. Given that these contain policies and goals already adopted by the Town, the Harbor Plan builds off these with a focus on the Harbor and its immediate surroundings.

Master Plan:

The Town of Dartmouth 2007 Master Plan³⁰ establishes a series of community values including the following related to harbor management.

“WE value

- “the rural character of our Town. The farmland, coastal interface, forests, wetlands, scenic vistas, and historic coastal and countryside village centers all contribute to this shared appreciation. Progress should not diminish or detract from the features that define the nature of our Town.
- “the great natural beauty of our community. The inland waters, coastal marshes, deciduous forests, meadows, and other natural areas, should be adequately protected from encroachment and degradation related to development.
- “traditional local industries with ties to our natural resources. Farming, fishing and marine industries have long provided jobs for residents and rooted the community in a harmonious relationship with the land and sea.
- “the small town feel that endures within a community that has gained big town attractions. Attention must be paid to the delicate balance of these two traits, with new development integrated in a manner that doesn’t sacrifice small town connections.
- “the varied water resources that set this Town apart. The abundance of fresh and saltwater bodies—beaches, rivers, streams, and ponds—provide clean water for drinking and opportunities for recreation.
- “our historical roots. Our heritage includes buildings and significant natural features that link us across time and enrich our community. Preservation of our historic built and natural landscape should be pursued.”

³⁰ Town of Dartmouth. 2007. 2007 Dartmouth Master Plan. Online at: www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/2007_dartmouth_master_plan.pdf

Open Space and Recreation Plan:

The Town of Dartmouth Open Space and Recreation Plan of 2015³¹ lists a number of critical open space and recreation needs within the Town from which the following are germane to harbor management.

- “To permanently protect and expand the inventory of unique environmental areas,
- “To improve protection of the quality and quantity of Dartmouth’s water resources,
- “To protect Dartmouth’s cultural and historical assets/heritage,
- [To expand] “recreational opportunities for people of all ages and abilities, including playfields, bike paths, picnic areas, trails, and waterfront access areas.”

Local Multi-Hazard Mitigation Plan:

The 2015 update to this plan³² provides a series of objectives in response to potential natural or human-induced hazards. The objectives include measures to:

- “Identify natural hazard risks and areas within the Town most likely to be impacted;
- “Complete a risk assessment to profile hazard events, inventory assets, and estimate potential losses;
- “Identify existing disaster mitigation measures already in place;
- “Develop proposed mitigation measures and a mitigation strategy based on the risk assessment;
- “Design a mechanism to keep the plan updated to reflect current conditions and establish a schedule for monitoring, evaluating, and updating the plan...”

A wide range of disaster types are discussed. Those that have particular application to harbor-related interests include:

- Floods
- Winter storm events
- Hurricanes and Nor’Easters
- Tornadoes and thunderstorms
- Future climate change and global warming

As with the previously mentioned plans, linkages between this plan and the Harbor Plan are discussed, as necessary, in the section on goals, objectives, and recommendations.

³¹www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/final_dartmouth_os_2015_2022.pdf

³²www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/final_dartmouthhazardmitigationplan.pdf

Section 2.4 Background Information Pertaining to Each Topic Area in the Plan

HARBOR COOPERATION/COORDINATION

More than 25 municipal, state and federal entities have jurisdiction in and/or responsibility for the Harbor, covering areas such as natural resource management, preservation of cultural resources, development, transportation, and public health and safety. In addition, multiple non-governmental organizations are active and have interests in the Harbor and its surroundings.

Presently, no single entity is charged with oversight of all harbor activities. Further, there is no entity charged with facilitating coordination among and between the various groups. Consequently, each group tends to focus solely on its areas of responsibility with limited sharing of planning intent, data, or management decisions.

Improved coordination among these groups can also ensure that the review and update of other planning documents (*e.g.*, the 2007 Dartmouth Master Plan, Open Space and Recreation Plan, and the Local Multi-Hazard Mitigation Plan 2015 Update) reflect the relevant and shared goals and implementation mechanisms of the Harbor Plan.

Implementation of the various recommendations of this Harbor Plan, as well as its eventual updating, will necessitate a similar level of coordination as was seen in its development.

Establishing some entity—either an existing or new designated individual or a commission/committee—charged with fostering and facilitating better coordination, cooperation and communication between agencies at the Town level and with state and federal agencies would advance the interests of the Town in three ways:

1. Expedite Town actions, whether regulatory or developmental, in and around the Harbor and provide an initial point of contact for the Town with state and federal agencies and non-governmental groups,
2. Expedite the consideration and implementation of the recommendations provided in this Harbor Plan, and
3. Provide a basis for the Harbor Plan's regular updating.

WATER QUALITY

Water quality in Padanaram Harbor has long been a concern for the Town and those who utilize the Harbor. For more than a half century, those close to the water have noticed the loss of eelgrass and changes in water clarity. In 1992, the Coalition for Buzzards Bay began monitoring various parameters of water quality through its ongoing Baywatchers program. In 2002, a cooperative program involving the Town, UMass Dartmouth School for Marine Science and Technology (SMAST), and the Lloyd Center for the Environment developed the “Turn the Tide” effort to “restore the ecological health of the estuaries and watersheds of the Town of Dartmouth”.³³ Subsequent to this latter effort, the MA DEP and SMAST commenced a project to identify nitrogen loading thresholds in the Harbor through the Massachusetts Estuaries Project. The project team issued a draft report in June of 2015,³⁴ and while the conclusions of the report have yet (as of January 2019) to be accepted by the Town (due to questions over assumptions in modeling and questions over data usage), it—and subsequent comments by reviewers—provides a detailed description of the waterbodies, a general discussion of sources of contamination, and an understanding of how nutrients move through the ecosystem of the Harbor.

In coastal waterbodies, there are generally four types of contaminants of concern:

- Nutrients,
- Pathogens,
- Toxic materials including heavy metals such as copper, cadmium and arsenic, and
- Petroleum products.

In Padanaram Harbor, the principal class of contaminants of concern is nutrients, particularly those that are nitrogen-based. In saline waters, nitrogen is considered the limiting factor that controls vegetative growth—too little nitrogen means a dearth of plant life, too much can lead to algal blooms. Nitrogen contamination will be discussed in greater detail below.

Pathogens (disease-causing bacteria, viruses, etc.) are of concern primarily for water contact activities such as swimming and for management of shellfish. In Padanaram Harbor, the staff of the Board of Health monitors the waters at the bathing beach at Apponagansett Park for presence of bacteria indicating fecal contamination. If these levels rise to a certain threshold, the beach is closed. The Massachusetts Division of Marine Fisheries (DMF) monitors the Harbor, generally on a monthly basis, for similar indicators of fecal contamination and has designated certain areas of the Harbor as closed to shellfishing, open on a provisional basis, or open. The runoff after a heavy rainstorm may result in increased levels of indicator bacteria in the water and lead to temporary restrictions on all shellfishing.

³³ Lloyd Center web page <http://lloydcenter.org/turn-the-tide/>

³⁴ UMass Dartmouth School of Marine Science and Technology and MA Department of Environmental Protection. 2015. “Massachusetts Estuaries Project, Linked Watershed-Embayment Model to Determine Critical Nitrogen Loading Thresholds for the Apponagansett Bay Estuary, Dartmouth, MA Draft Report—June 2015”.

Sampling or monitoring for heavy metals within the Harbor is not conducted, but one might expect to find some elevated levels in bottom sediments around boatyards, given past use of bottom paints and other marine treatments. Current regulations by the MA DEP require boatyards to carefully manage runoff to control any deposition into the Harbor.

Fuel spills or runoff may lead to temporary contamination within the Harbor; however, there are state-mandated mechanisms in place, administered through the Harbormaster’s Department and the Fire Districts, to contain and clean up spillage and this is not considered an ongoing source of contamination.

Current Conditions and Management System

Contaminant Inputs—Nutrients

The Estuaries Project focusses on nitrogen contamination as the most significant water quality concern for the Harbor. Their report generally defines the Harbor as a “mesotrophic (moderately nutrient impacted) to eutrophic³⁵ (nutrient-rich) embayment”,³⁶ but goes on to discuss the Harbor as consisting of three areas: the southern portion of the Harbor open to Buzzards Bay, the northern portion constrained by the causeway and bridge, and Dyke Creek and surrounding marsh area constrained by the Gulf Road Bridge. Each of these is discussed in detail as to sources, uptake and flushing of nutrients.

The report identifies four principal sources of nitrogen to the harbor system:

- Leeching from on-site septic systems not designed to confine nutrients that are located in those areas not served by sewer systems,
- Stormwater runoff that picks up nitrogen on its way to the Harbor,
- Residential and agricultural fertilizer use, and
- Atmospheric deposition.³⁷

The first three of these can be managed locally. Atmospheric deposition has its sources across town and state boundaries, and local attempts at control have little effect.

The watershed for Padanaram Harbor is shown in Figure 4 below. It extends well beyond the immediate Harbor planning area past Buttonwood Park to Route 195, with 90% of the land area in Dartmouth and the remaining 10% in New Bedford. The northern and eastern portions are heavily developed, while the western and southern segments are more sparsely inhabited. As seen in Figure 5 below, the overall watershed area can be broken into six sub-watersheds.

³⁵ Eutrophic is generally defined as rich in nutrients and consequently supporting a dense plant population which, as it decomposes, can kill animal life by depriving it of oxygen.

³⁶ *Ibid.* Page 1

³⁷ Atmospheric deposition occurs as a result of human activities such as fossil fuel combustion or high intensity agriculture and leads to elevated levels of nitrogen compounds in the atmosphere above normal, background conditions. These compounds travel with prevailing winds or other atmospheric movement and will drop to the ground with precipitation events. Such compounds may travel hundreds to thousands of miles from their source before being returned to land or water surfaces. Direct deposition to waterbodies or runoff from land may lead to measurable increases in nutrients in marine environments.

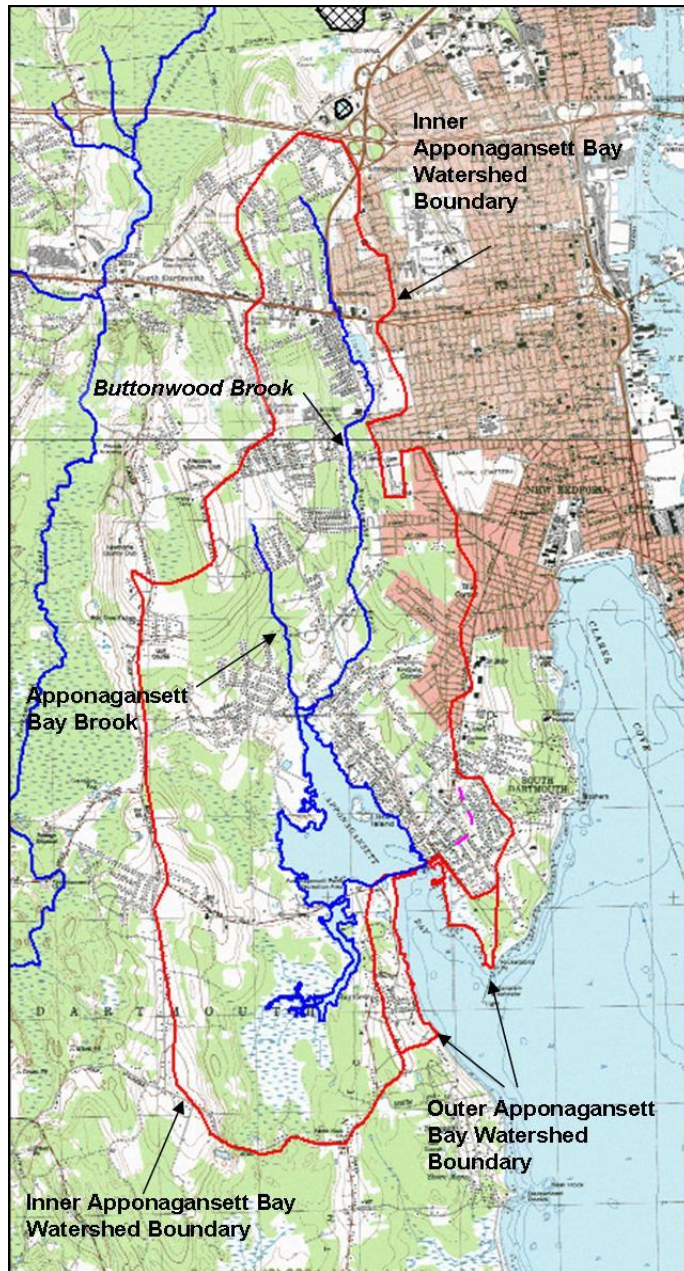


Figure 4: The watershed area draining to Padanaram Harbor¹

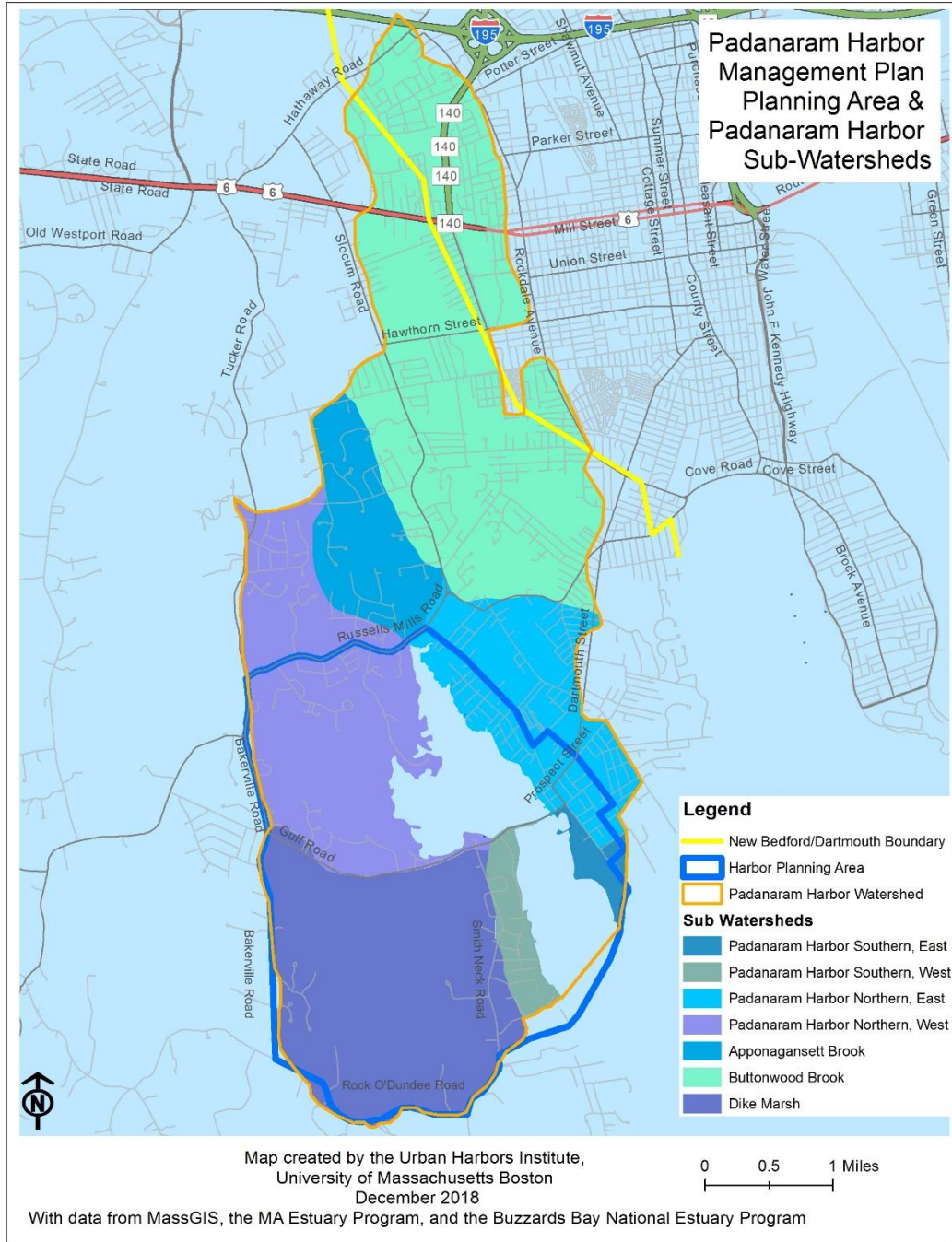


Figure 5: Sub-watersheds draining to Padanaram Harbor

The Massachusetts Estuary Project’s report provides a calculation, based on a numerical model, of estimates of nitrogen input from the various sub-watersheds. A review of the report by the Buzzards Bay National Estuary Program³⁸ disputes some of the assumptions used to calculate the inputs and offers different estimates to be attributed to the sub-watersheds. However, both agree that the most significant input is from

³⁸ *Ibid.*

Buttonwood Brook— more than twice the nitrogen loading than from any of the other sub-watersheds in both estimates. Additional elevated levels are introduced from Apponagansett Brook (aka Vincent Brook) at the head of the Bay. The two documents also agree that the inputs to the northern portion of the Harbor are higher than to the southern portion. Based on data from monitoring stations at the lower end of the two brooks that enter the northern portion of the Harbor, water flow therein is strongly reflective of precipitation— generally low in flow volume but increasing dramatically in response to rainfall. Consequently, nitrogen loading through this system is “pulsed” in accordance with storm events.

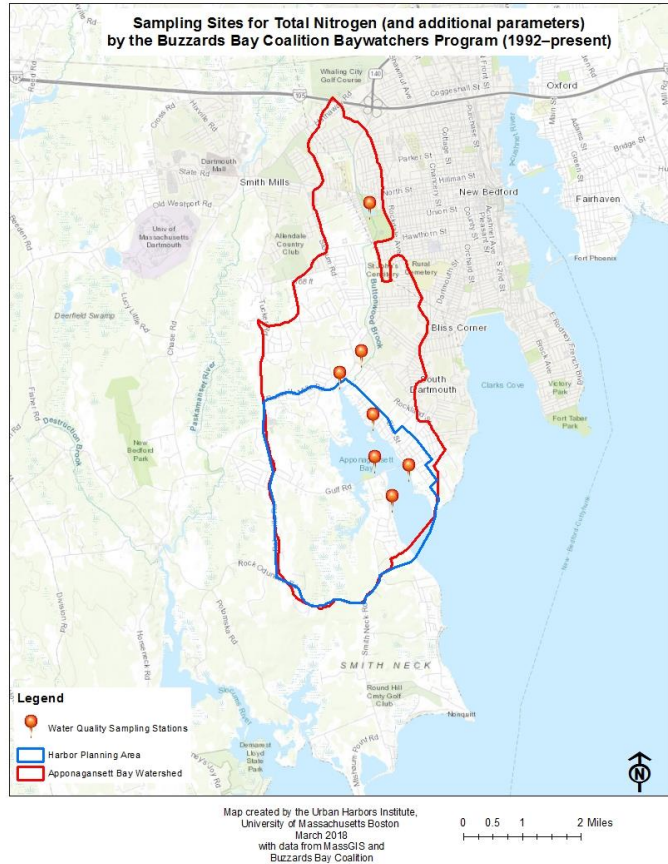


Figure 6: Sampling Sites for Total Nitrogen.

The Estuary Project noted that this input from the two brooks resulted in, “relatively strong gradients [that] define the nutrient characteristics of the [Padanaram Harbor]³⁹ and these also control the associated habitat impacts. **There is a clear nutrient gradient between [northern] and [southern Padanaram Harbor] with highest nitrogen and lowest environmental health in the [northernmost] portions of the embayment and particularly in the northern part of the [northern] system and lowest nitrogen and greatest health in the [southern] embayment near Buzzards Bay.** The [northern] embayment of [Padanaram Harbor] is presently showing poor water quality and “Eutrophic” conditions [southern Padanaram Harbor] is demonstrating better water quality...”. [Emphasis added.]

Since 1992 the Baywatchers Program of the Coalition for Buzzards Bay has been monitoring nitrogen levels in various areas within the Harbor. Their monitoring stations

³⁹ Note that the Mass Estuary Project consistently uses the terms “Apponagansett Bay”, “inner Bay” and “outer Bay” while the Harbor Advisory Committee chose to use the terms “Padanaram Harbor”, “Northern portion” and “Southern portion” respectively. Consequently we inserted terms bounded by [] indications into quotes from the Estuary Project report.

(see Figure 6) have been designed to test the validity of the nutrient gradient and testing results confirm its presence.

The Massachusetts Estuary Project report attributed the bulk of nutrient input to the Harbor to “wastewater” from on-site septic systems (43%) with secondary inputs from use of fertilizers (15%) and runoff from impervious surfaces (17%).⁴⁰ Comments from Costa⁴¹ contend that there is more extensive sewerage and fewer on-site septic systems than what the Estuary Project estimated (Figure 7). Those comments found wastewater, fertilizers, and runoff from impervious surfaces all to be in the 15–20% range.

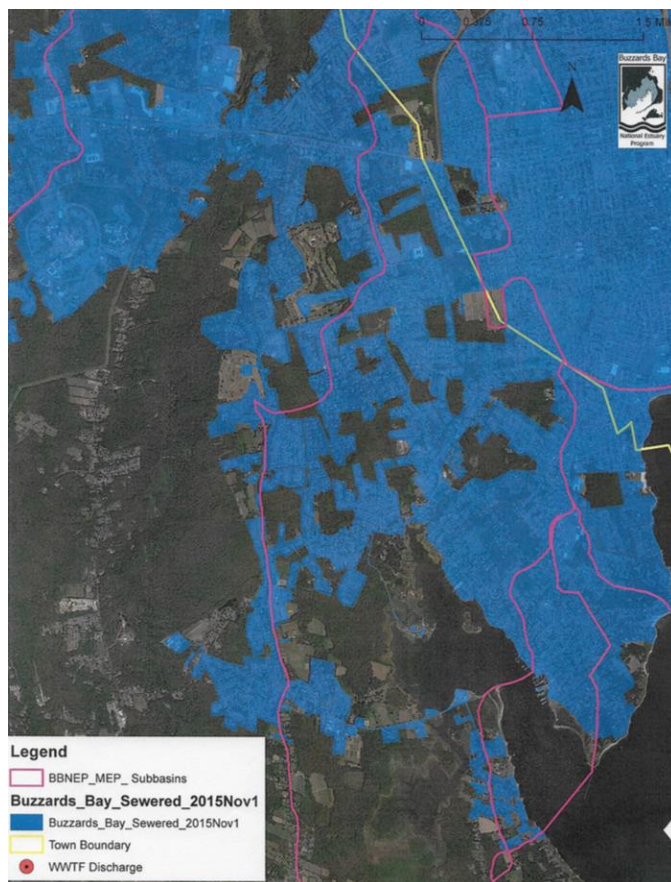


Figure 7: Sewered areas (in blue) of the Padanaram Harbor watershed as of 2015. Courtesy of the Buzzards Bay National Estuary Program

The Estuary Project report suggests that, “Almost all nitrogen entering the [Padanaram Harbor] embayment is transported by surface water (streams).”⁴² This includes nitrogen from septic systems and/or fertilizers that travel through groundwater and discharge into streams prior to reaching the Harbor. Given the importance of streams in the introduction of nitrogen to the Harbor, the inputs from Buttonwood Brook and the Apponagansett Bay Brook (sometimes called Vincent Brook)—particularly the former—are especially important.

⁴⁰ *Op cit.* taken from Table on page 54.

⁴¹ Comments on MEP June 2015 draft TMDL report for Apponagansett Bay, Joseph E. Costa, Buzzards Bay National Estuary Program, September 11, 2015

⁴² *Ibid.* Page 4

The stated purpose of the Massachusetts Estuary Project report is to provide the Total Maximum Daily Load (TMDL) of nitrogen into the Harbor to meet specific environmental thresholds. The TMDL offered for the northern portion of the Harbor made the assumption that eelgrass was never present in that area and consequently was designed to protect benthic animal life and reduce threats from hypoxia (an oxygen deficiency) or anoxia (absence of oxygen) in the water column. Because of better flushing in the southern portion of the Harbor due to proximity to the open water of Buzzards Bay, the TMDL provided for this area would allow for maintenance, and possible expansion of eelgrass beds.

Reviewer comments from Costa⁴³ question the premise that eelgrass has not historically existed in the northern portion of the Harbor and offers documentation—through historic nautical charts and sediment cores—that eelgrass appears to have been present up until the 1940s and perhaps into the early 1950s.⁴⁴

The importance of the questions of whether there was eelgrass historically and whether the TMDL should be designed to allow for eelgrass to repopulate the northern portion of the Harbor will be critical to future actions by the Town. Eelgrass provides important habitat for a wide range of benthic life—including commercially important shellfish—and for the juvenile stages of many fish species. Additionally, it helps solidify the bottom sediments, thereby maintaining water clarity. Finally, its presence is important in maintaining oxygen levels in the water.

The Padanaram Harbor Advisory Committee, at its initial meeting, agreed that the Plan should include recommendations to restore water quality in the northern portion of the Harbor to a level that would support re-introduction of eelgrass and for the southern portion to allow existing eelgrass to flourish and expand.

In current conditions, the nutrient gradient from north to south results in a difference in habitat type and in the plant and animal species found in the various areas.

Contaminant Inputs—Pathogens

The Estuary Project report noted that Buttonwood Brook is “the largest contributor of bacteria to the [northern portion of the Harbor].”⁴⁵ (In this case, and below, the term “bacteria” will be used to indicate the possible presence of pathogens.) The report noted strong sources occurring primarily in wet weather north of Buttonwood Park, the Buttonwood Zoo area, and mouth of the Brook. All three of these areas are reportedly being addressed by the City of New Bedford, the Buttonwood Park Zoo, and the Town of Dartmouth respectively; however, specifics details about what has been or is being done or monitoring results to assess the success of these efforts have yet to be identified.

Three stormwater outfalls on the eastern shore—Fort Street, Bridge Street and Tradewinds Lane—were found to have “significant sources” of bacteria following rainfall events. At two of these locations, the Dartmouth Department of Public Works has installed catchment systems designed to minimize sediment or other solids possibly

⁴³ *Ibid.*

⁴⁴ For further information regarding the presence of eelgrass in Padanaram Harbor, see <http://buzzardsbay.org/living-resources/eelgrass/eelgrass-historical/historical-eelgrass-apponagansett-bay/>

⁴⁵ *Ibid.* Page 26.

containing bacterial indicators⁴⁶ but data on the effectiveness of the efforts are not yet available.

Contaminant Exports (“flushing”)

Water quality within an embayment is, in part, a balance between the volume of contaminants entering the system and the speed at which they are flushed out by riverine flows or tidal action. Given the limited flow of water to Padanaram Harbor from Buttonwood Brook and Apponagansett Brook, there is no significant riverine flow to “wash out” contaminants. The bulk of export of contaminants is due to tidal action.

Water within Padanaram Harbor is regularly exchanged with the relatively cleaner waters of Buzzards Bay with the rise and fall of the tides. During this “flushing”, contaminants are exported from the Harbor. The Estuary Project Report found that the Harbor as a whole had a reasonably high tidal flushing rate/low residence time due to its relatively elongated shape and limited depths. Interestingly, the northern portion of the Harbor had a shorter residence time than the outer portion—mostly due to its shallow nature. Extensive modelling and field data collection for the report suggested, “The limit to the flushing ability of [Padanaram Harbor] is not due to hydrodynamic constrictions, but rather the small tide range in Buzzards Bay itself.”⁴⁷

As part of a proposal for marsh restoration, tidal elevation data were collected above and below the causeway to estimate the restriction it might cause. In that limited evaluation, it was found that the maximum spring tidal difference from inside to outside the causeway was 3.96 inches or 7.2% restriction.⁴⁸

The question remains open as to whether the causeway and/or bridge inhibits flushing to a significant extent, however the higher flushing rate/lower residence time of the northern portion of the Harbor suggests that the issue may be less one of flushing and more one of an input of higher levels of nitrogen than the system can tolerate while maintaining a healthy balance.

Nutrient Balance within the Harbor

As the above has indicated, the Harbor has relatively good flushing conditions but the input of nitrogen has somewhat outstripped the capacity of the Harbor to cleanse itself. Because the northern portion of the Harbor that receives the initial input of the nutrients, primarily via Buttonwood Brook, is shallower and consequently somewhat warmer during daytimes than the southern portion of the Harbor, the environmental impacts are more significant there. Eel grass has disappeared, replaced by macroalgal accumulations and high levels of phytoplankton. There is a reduced number of benthic animal species and absolute numbers, diversity, and distribution/evenness.⁴⁹ The southern portion of the Harbor shows remaining patches of eelgrass and a higher quality benthic habitat. These differences in flora and fauna demonstrate the impacts of the gradient of nitrogen levels between the northern portion of the Harbor and the southern portion.

The Estuary Project Report summarized these conditions as follows,

⁴⁶ Dave Hickox., Dartmouth Director of Public Works, 2018. Pers. comm.

⁴⁷ *Op. cit.* Page 103

⁴⁸ Michael O’Reilly, Town of Dartmouth Environmental Affairs Coordinator, 2017. Pers. comm.

⁴⁹ *Op. cit.* Page 137.

“At present [circa 2015], the [Padanaram Harbor] system is just beyond its ability to assimilate nitrogen without impairment. It is presently showing a low-moderate level of nitrogen enrichment, with some moderate impairment of eelgrass ([southern] basin) and appears to be just beyond its nitrogen loading limit relative to sustaining high quality infaunal habitats within the [northern] Basin. This is particularly evident in the upper and western tidal reaches of the system which receive freshwater discharges from Buttonwood Brook and Apponagansett Brook The evidence indicates that nitrogen management of this system will be for restoration rather than for protection or maintenance of an unimpaired system.”⁵⁰”

Note that the “just beyond” limit for the northern portion of the Harbor is based on maintaining benthic fauna and not on the higher standard to re-establish eel grass.

Related Planning and Goals

Several past planning efforts have addressed water quality issues and goals for management. These are presented here as they indicate the current policy and direction of the Town—the context in which the Harbor Plan was developed. It should be clearly noted that these are goals and objectives proposed by the Town and do not necessarily indicate implementation. Included are the following:

2007 Dartmouth Master Plan

“WE value the varied water resources that set this Town apart. The abundance of fresh and saltwater bodies—beaches, rivers, streams, and ponds—provide clean water for drinking and opportunities for recreation.”

- **Goal 3:** To preserve, protect, and maintain the quality of the town’s natural resources (page 8–27)
 - **Objective 3a.** Protect the quality of town water resources (page 8–27)
 - Enforce existing regulations affecting all fresh, ground, and coastal waters.
 - Develop regulations for nitrogen management according to water quality issues for [the Harbor] watersheds.
 - Continue a comprehensive monitoring program of all town waters to identify problem areas.
 - Develop town-wide watershed standards to minimize storm water runoff and maximize recharge.
 - Limit development that would harm water quality of ... [Padanaram Harbor].
 - Continue monitoring of Buttonwood Brook for point and non-point source pollutants.
 - Continue to extend sewers to remediate areas [sic] widespread septic failures that are negatively affecting water resources.
 - Create education programs on the importance of ... nitrogen management and control measures for Dartmouth property owners.

⁵⁰ *Op. cit.* Page 144.

- Explore the implementation of a septic maintenance program.

Buzzards Bay National Estuary Program

The Buzzards Bay National Estuary Program is funded by the U.S. EPA and administratively housed within the Massachusetts Office of Coastal Zone Management. In 1991, it produced a Comprehensive Conservation and Management Plan (CCMP) for Buzzards Bay (updated in 2013). It included several management methods applying to Padanaram Harbor and its watershed area, including recommendations for:

- Sewering, nitrogen removal septic systems, agricultural fertilizer/manure management. Comprehensive strategies to manage/offset nitrogen inputs from new development,
- Manage stormwater, and
- Enforce Title 5, improve management and oversight of onsite systems, communal systems with alternative technology over individual advanced tech systems in areas where advanced nutrient removal required.

LAND USE

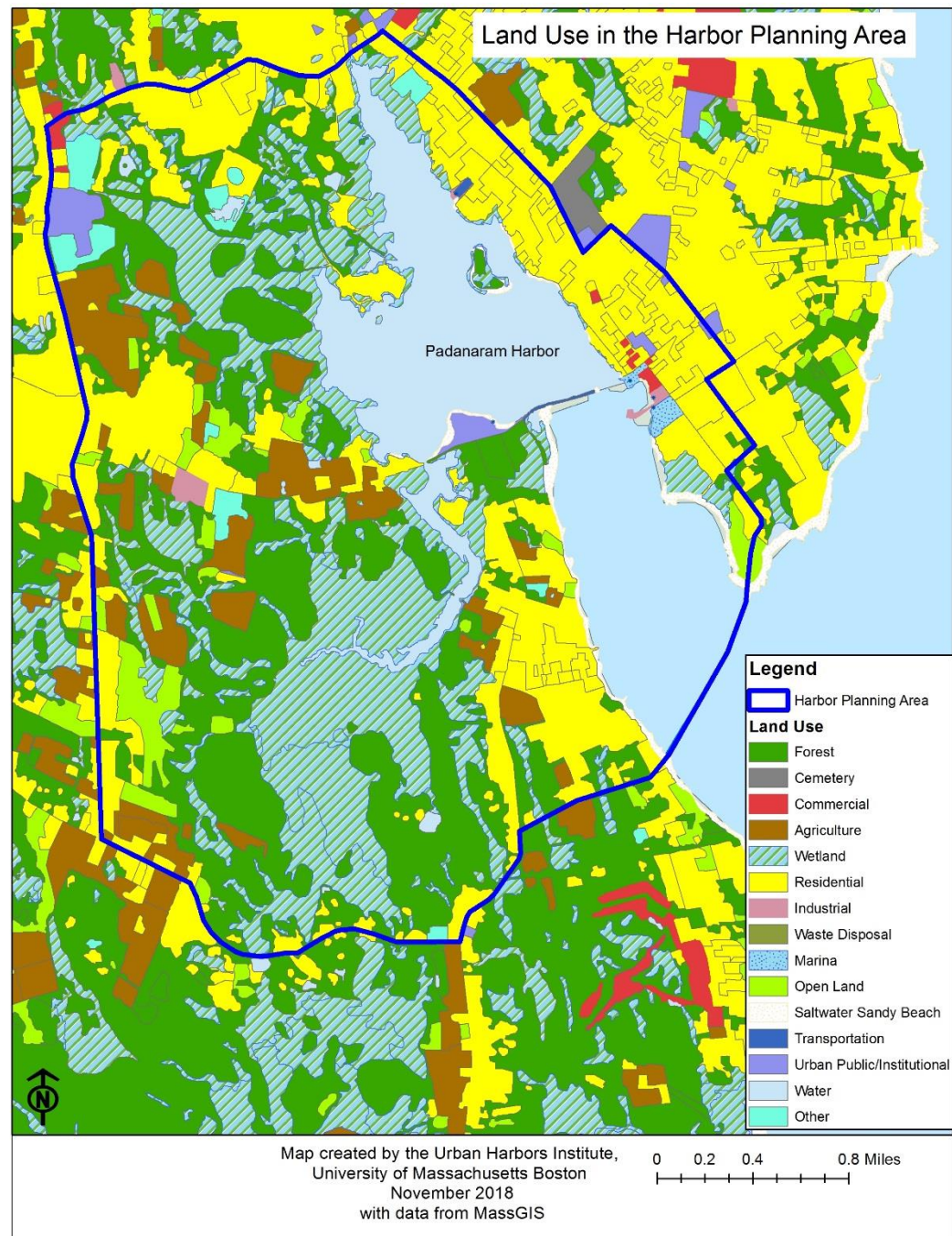


Figure 8: Town of Dartmouth Land Use Map

Dartmouth is known for having a mix of suburban and rural character, as well as vast natural beauty which includes inland waters, coastal marshes, deciduous forests, meadows, and other natural areas.⁵¹ Dartmouth is dedicated to protecting these natural

⁵¹ Town of Dartmouth. 2007. 2007 Dartmouth Master Plan.

areas from encroachment and degradation related to development,⁵² and preserving its small town feel while encouraging new development that does not sacrifice small town connections.⁵³

Figure 8 displays the land use bordering Padanaram Harbor. Primarily, the Harbor is directly surrounded by sandy beaches, residential areas, and saltwater wetlands. There is a 5-acre beach, open to the public, located on the western edge of the outer Harbor. Apponagansett Park is located adjacent to the Harbor and includes a small beach, playground, and recreational areas.⁵⁴ The eastern side of the Harbor is primarily occupied by residential homes.

Open Space

The Town of Dartmouth recently developed the Town of Dartmouth Open Space and Recreation Plan 2015 – 2022, which is an update to the 2009 Open Space and Recreation Plan. The purpose of the plan is to protect, preserve, and increase the town's open space and recreation assets and resources.⁵⁵

There are three major entities in Dartmouth responsible for the procurement and management of open space in the Town: the Dartmouth Natural Resource Trust (DNRT), the Dartmouth Conservation Commission, and the Dartmouth Department of Parks and Recreation.

- The DNRT is a non-profit, accredited land trust founded in 1971. It currently owns over 1,700 acres of land. In total the DNRT protects and maintains more than 5,100 acres of land and over 35 miles of hiking trails. It aims to accomplish its mission through land acquisition and protection. Along with open space, the DNRT also identifies and protects key wildlife habitats, farmlands, historic sites, and wetlands through land management practices, partnerships, and outreach programs.⁵⁶
- The Dartmouth Conservation Commission is one of the oldest such commissions in Massachusetts, dating back to 1961. One of the primary objectives of the Conservation Commission is to administer the Massachusetts Wetlands Protection Act and the Dartmouth Wetlands By-law, which was adopted in 1980. In partnership with the DNRT, the Conservation Commission owns approximately 2,000 acres of protected open space.⁵⁷
- The Dartmouth Department of Parks & Recreation is responsible for managing the roughly 300 acres of parks, including public beaches, in the Town of Dartmouth. This Department is also responsible for the town's recreational programming. The Department is made up of the Cemetery Division, the Public Parks and Beaches Division, and the Recreation Division.⁵⁸

⁵² *Ibid.*

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*

⁵⁶ Dartmouth Natural Resources Trust. No date. About DNRT. Online at: <https://dnrt.org/about/>

⁵⁷ Town of Dartmouth. No date. Conservation Commission. Online at: <https://www.town.dartmouth.ma.us/conservation-commission>

⁵⁸ Town of Dartmouth. No date. Parks and Recreation. Online at: <https://www.town.dartmouth.ma.us/parks-and-recreation>

Together these entities have made great progress in strategic preservation of open space in the Town of Dartmouth. Figure 9 shows the land dedicated as open space that currently surrounds Padanaram Harbor.

Between 1960 and 2000, Dartmouth, along with many other rural towns, experienced an increase in development.⁵⁹ During these four decades, Dartmouth lost almost 40% of the town's agricultural land and 13% of its forested land.⁶⁰ Given that the population in Dartmouth and neighboring communities is expected to increase from 34,032 in 2010 to 40,332 in 2030,⁶¹ the Town is dedicated to preserving and protecting its natural resources, including open space.

One of Dartmouth's most valuable natural assets is the large amount of open space in the form of farmland. Massachusetts General Law Chapter 40A, Section 3 protects farmland by stating that no local zoning by-law may prohibit, unreasonably regulate, or require a special permit for the use of land for the primary purpose of agriculture. In 2003, Dartmouth was designated a "right to farm" community when it reiterated these rights and the importance of and support for farming within the Town in a "right to farm" by-law Article 85). This by-law encourages the pursuit of agriculture, promotes agriculture-based economic opportunities, and protects farmlands within the Town of Dartmouth by allowing agricultural uses to function with minimal conflict with abutters and town agencies.

To protect the valuable farmland from development, the DNRT established the "Farmland Protection Initiative" which involved the establishment of a fund specifically for assisting the Town in acquiring farmland under the "right of first refusal" clause of Massachusetts General Law 61A.⁶²

⁵⁹ *Ibid.*

⁶⁰ *Ibid.*

⁶¹ *Ibid.*

⁶² Dartmouth Natural Resources Trust. No date. Ways To Protect. Online at: <https://dnrt.org/ways-to-protect/>

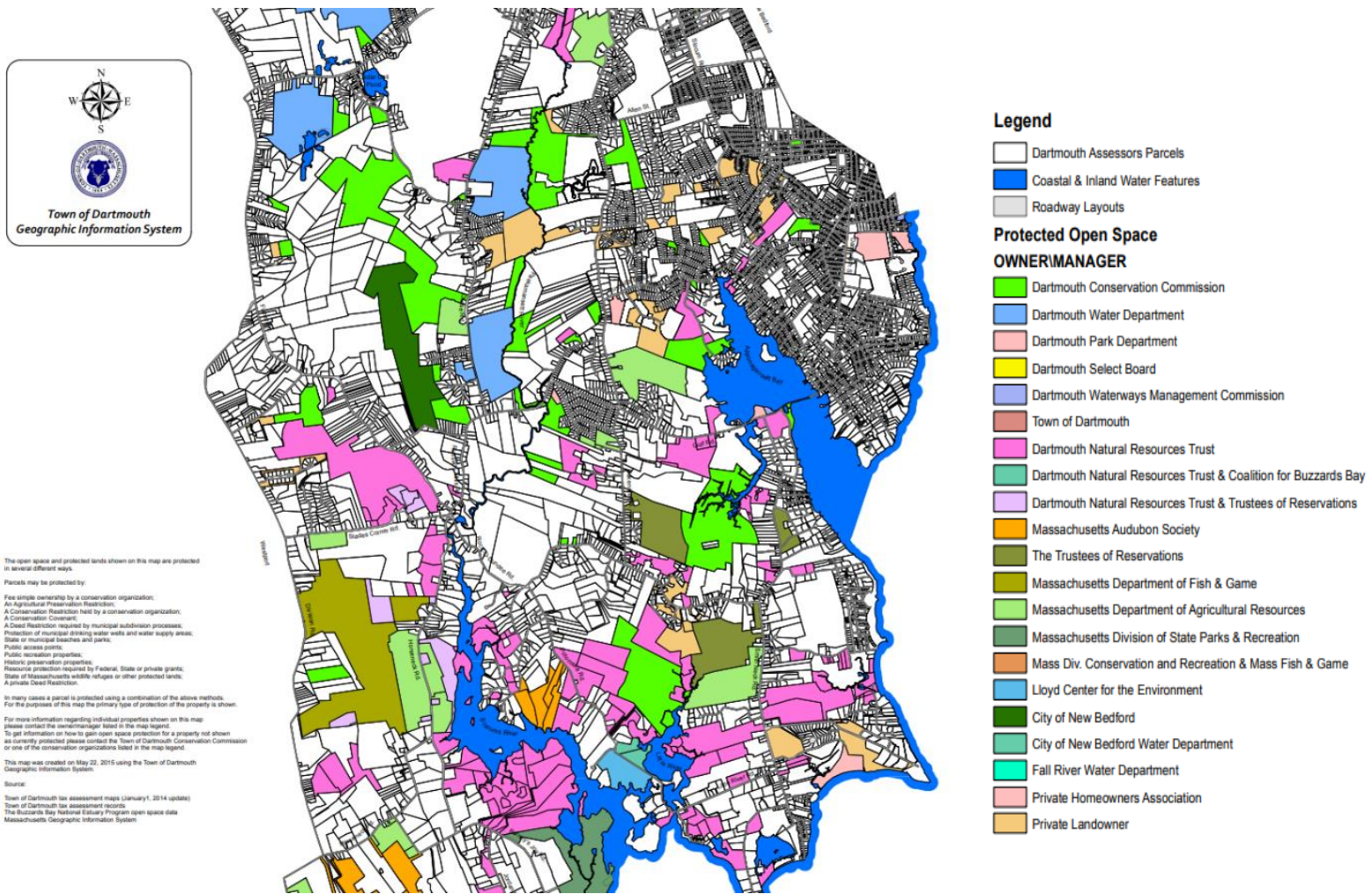


Figure 9: Town of Dartmouth Protected Open Space by Owner/Manager

Open space is important to Dartmouth and other communities for a variety of reasons. Coastal and inland wetlands act as flood protection barriers, and absorb water from flooding that would otherwise cause property damage and safety issues.⁶³ Barrier beaches, tidal flats, and sand dunes also act as protective barriers from large storms and high tides.⁶⁴ By protecting these types of natural resources, Dartmouth is in turn protecting itself from the likelihood of flooding.⁶⁵ Additionally, open space protection is a significant factor in limiting the amount of nitrogen loading in the Harbor, which is particularly important given Padanaram Harbor's water quality issues.⁶⁶ (See the section on Water Quality for more information.) Open space also serves as important habitat for wildlife, including migratory birds; unfortunately, however, these birds may contribute to nitrogen loading problems in the Harbor.

Dartmouth residents and visitors also rely on the town's open space near the waterfront for recreational activities and for access to the Harbor, which is extremely important to the Town and members of the community and is discussed further in the Public Access section of this Harbor Plan.

Development

When considering the entire Padanaram Harbor watershed, more than 80% is developed, and this level of development affects water quality and natural resources. Land use intensity can be categorized as low intensity, such as open space or managed park areas, or high intensity, such as commercial and urban centers.⁶⁷ More intensely developed areas have a greater amount of impervious surface, such as roads, driveways, parking lots, sidewalks, and rooftops, which prevent water from infiltrating the ground and increase stormwater runoff, which in turn impacts water quality. In contrast, open space, such as farmlands and recreation areas, collect and filter water and provide habitat for wildlife. Communities need a balance of development and open space to sustain a vibrant economy and to maintain healthy natural resources.

Building permit trends indicate that the pace of urbanization in Dartmouth has been slowing down in recent years.⁶⁸ In 2000, 150 building permits for single family residential homes were issued. Between 2005 and 2013, the average number of permits issued was 43 per year.⁶⁹

As part of the town's efforts to manage conservation issues, along with the increasing demand for housing, a buildout study was conducted in 2016. The study estimated the amount of single and two-family development that could take place under the current zoning regulations while not compromising any conservation efforts and regulations in the community. The study utilized parcel data in order to determine roughly how many units could be developed on existing parcels either through subdivision or development on vacant parcels. The study concluded that an additional 4,002 single-family units could

⁶³ Town of Dartmouth. 2007. Dartmouth Master Plan.

⁶⁴ *Ibid.*

⁶⁵ *Ibid.*

⁶⁶ *Ibid.*

⁶⁷ Miller, B. 2002. The Relationship Between Land Use Decisions and the Impacts on Our Water and Natural Resources. Online at: <https://ag.purdue.edu/soilandwater/the-relationship-between-land-use-decisions-and-the-impacts-on-our-water-and-natural-resources/>

⁶⁸ Town of Dartmouth. 2015. Open Space and Recreation Plan (2015 – 2022).

⁶⁹ *Ibid.*

be developed on 820 existing parcels. Out of those 820 total parcels in the study, 112 parcels were found to be suitable for development of two-family homes as opposed to single-family units. A shift from 365 single-family units on these 112 parcels to 246 two-family units represented an increase of 119 housing units. As it relates to the Harbor planning area, there are a number of parcels on the west side of the Harbor that show the potential for additional single-family units as well as several parcels on the east side that have been identified as suitable for two-family development. As a result of this study, the Town of Dartmouth is better prepared to manage the issues surrounding the demand for more housing while balancing the conservation goals of the community.⁷⁰

As discussed in the section on Commercial Uses, commercial uses play a vital role in the economy and culture in Padanaram Harbor. Preservation of the working waterfront as well as maintaining adequate zoning for maritime industrial uses is necessary for these businesses to succeed.

In looking to the future, the State continues to move forward with the South Coast Rail project, a planned commuter rail service between Boston and southeastern Massachusetts, including a station in New Bedford. If this project is completed as planned, Dartmouth likely would see an increase in population, with a corresponding increase in property values and increased strain on land use and harbor resources. In addition, the State continues to take steps toward regulating the growing short-term rental market illustrated by popular online rental sites such as Airbnb, HomeAway, and VRBO, with particular concern for non-owner occupied short-term rentals. Dartmouth currently does not have any regulations regarding these short-term rentals, some of which are located in the Harbor planning area.

Zoning

One of the key land use issues for a community is the determination of what allowable uses are permitted under the zoning by-laws.⁷¹ In the Harbor planning area there are six distinct zoning districts, and one overlay district (Figure 14). These districts are: Single Residence A, Single Residence B, General Residence, Village Business, Neighborhood Business, Maritime Industrial District, and Waterfront Overlay District.

⁷⁰ Hansen, Jr., J and K. Goodrum. 2016. Dartmouth Buildout Study. Online at: <https://www.town.dartmouth.ma.us/sites/dartmouthma/files/news/dartmouthbuildoutreport.pdf>

⁷¹ Town of Dartmouth. 2014. Zoning By-laws. Online at: <https://www.town.dartmouth.ma.us/town-clerk/pages/zoning-laws>

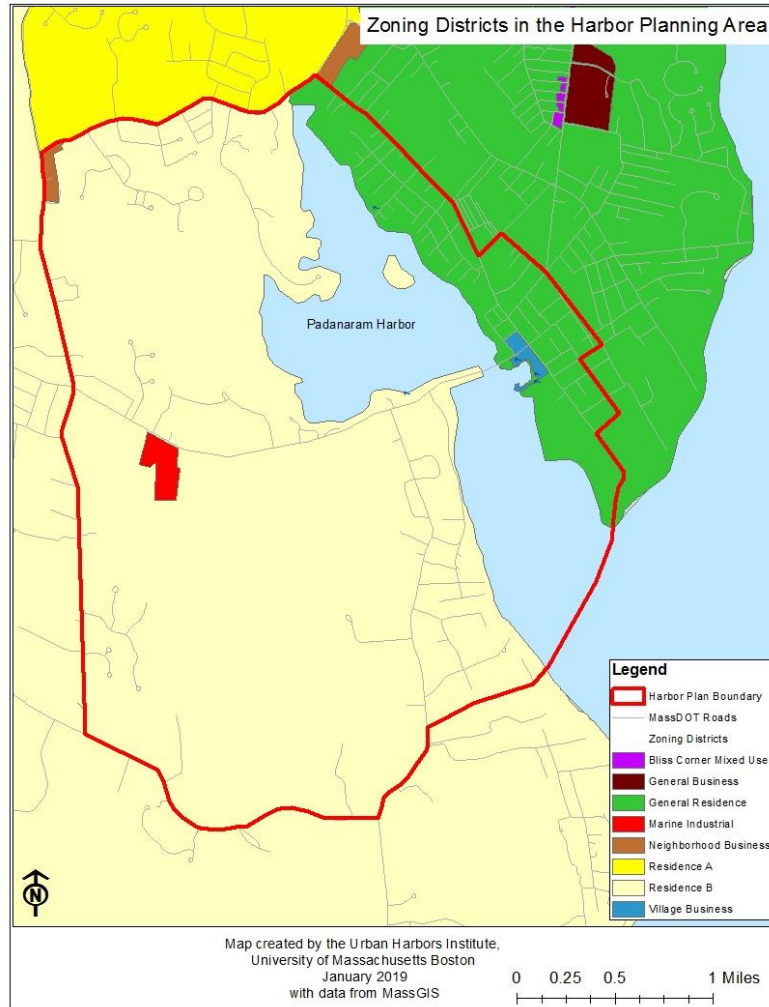


Figure 10: Zoning Districts in the Harbor Planning Area

The Single Residence A District’s⁷² allowed uses focus on residential uses, such as single family dwellings; garages, sheds, and storage buildings; and accessory apartments and room rentals. Other low-impact allowed uses include conservation areas, natural recreation areas, home occupation and education, and places of worship. As a “right to farm” community, agricultural uses, aquaculture farming, and shellfishing are also allowed uses in this district. Special permit uses include yacht and beach clubs, bed and breakfast establishments, and golf courses.

The Single Residence B District⁷³ has the same allowed uses as the Single Residence A District; however, there are different minimum lot areas in each district. The minimum lot area for all uses in the Single Residence A District is 40,000 square feet and 80,000 square feet in the Single Residence B District.

⁷² Town of Dartmouth. 2014. Zoning By-laws. Single Residence A District. Online at: <https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/z04a.pdf>

⁷³ Town of Dartmouth. 2014. Zoning By-laws. Single Residence B District. Online at: <https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/z04b.pdf>

The General Residence District⁷⁴ has the same allowed uses as the Single Residence A and B Districts, with the addition of two-family dwellings. The general minimum lot area in this district is 15,000 square feet, except for two-family dwellings, which have a minimum of 20,000 square feet.

The Village Business District's⁷⁵ allowed uses include a variety of residential and commercial uses, such as yacht and beach clubs, boat repair, storage of boats and accessories, aquaculture, retail sales and services, restaurants, business and medical offices, single-family and two-family dwellings, museums, art galleries, libraries, and places of worship.

The Neighborhood Business District⁷⁶ allows the same uses as the Single Residence or General Residence Districts, with some additional allowed uses, such as retail food and variety store, pharmacy, commercial laundry or dry cleaning, hardware or houseware store, nursery or garden supply store, barber shop or beauty salon, restaurant, bakery, real estate sales office, and branch bank. Special permit uses are also the same as Single Residence or General Residence Districts, with some additional special permit uses, such as retail sales outlet, gasoline or automotive service station, and day-care center.

The Maritime Industrial District⁷⁷ provides for harbor-dependent industrial uses or industrial uses which support maritime activities. In this district, no building or premises can be used and no building or structure can be erected which is intended or designed to be used for any uses other than the following allowable uses: construction, repair, and storage of boats, vessels, and related accessories; sail making and marine canvas work; marine research labs and related facilities for marine product development, including the design, assembly, and fabrication of marine electrical, hydraulic, plumbing, propulsion, and similar systems; office space for yacht designers, marine general contractors, consultants, marine equipment brokers, and vessel brokers; uses related to shellfishing or fishing in Dartmouth waters, provided that no shellfish or fish are processed within the district; and office use and sales facilities incidental to the allowed uses, the area of which may not exceed 20% of gross floor area.

The Waterfront Overlay District⁷⁸ provides adequate areas in the Town for harbor-dependent uses so as to prevent encroachment by uses detrimental to harbor-dependent uses, ensure the long-term survival of such uses, and promote access to the waterfront. This overlay district is designed to manage growth while preserving the town's maritime heritage. Allowable uses in this overlay district include boatyards, marinas, and yacht clubs; construction, repair, and storage of boats, vessels, and related accessories; office space for yacht designers, marine general contractors, consultants, marine equipment brokers and vessel brokers; uses related to shellfishing or fishing in

⁷⁴ Town of Dartmouth.2018. Zoning By-laws. Chapter 375-10. Online at: <https://ecode360.com/30833582>.

⁷⁵ Town of Dartmouth.2018. Zoning By-laws. Chapter 375-15. Online at: <https://ecode360.com/30833582>.

⁷⁶ Town of Dartmouth.2018. Zoning By-laws. Chapter 375-14. . Online at: <https://ecode360.com/30833582>.

⁷⁷ Town of Dartmouth.2018. Zoning By-laws. Chapter 375-20. Online at: <https://ecode360.com/30833582>.

⁷⁸ Town of Dartmouth.2018. Zoning By-laws. Chapter 375-26. Online at: <https://ecode360.com/30833582>.

Dartmouth waters, provided that no shellfish or fish are processed within the district except for sale on site; marine transportation uses, such as ferries, launch services, and marine towing services; and non-profit marine educational uses. Special permit uses include all residential development, commercial uses greater than 2,000 square feet, restaurant uses greater than 4,000 square feet, and parking facilities of 10 or more spaces for uses other than the allowed uses in this district.

DREDGING AND NAVIGATION

Padanaram Harbor has water depths ranging from 1 foot to 24 feet, with some areas of the Harbor completely dry at low tide. There appears to have been significant silt build-up, possibly from freshwater input or stormwater runoff, which has restricted navigation in the northern portion of the Harbor.

Padanaram Harbor does not have a Federal Navigation Project (*e.g.*, a dredged area maintained by the U.S. Army Corps of Engineers (USACE)), which is a dredging project for a waterway that is considered an asset to both U.S. commerce and national security. Because of this, the USACE has never undertaken any construction, including dredging for navigational purposes, at this site. The USACE studied the Harbor in 1937 as a possible Federal Navigation Project. The study concluded that the Harbor had insufficient commercial navigation activity to warrant Federal participation in an improvement dredging project. The Town may approach the USACE to re-visit the potential to be considered a Federal Navigation Project if a demonstrable need arises.

Within the Harbor, the New Bedford Yacht Club Basin was dredged in 2004, and is reportedly again in need of dredging. The main Apponagansett Bay channel also has some shallow areas, which may now or in the future result in vessels waiting on high tides to navigate certain segments. Additionally, the northern portion of the Harbor is very shallow, and in some places, completely exposed at low tide. There are also sandbars within the Harbor, which include, but are not limited to: an area within the channel in the southern segment of the Harbor; near Smith Neck Road; near the causeway; and just beyond South Wharf. One theory is that beach sand, dumped at Bay View, is migrating and creating these sand bars within the Harbor.

The ramp area at Arthur Dias Landing in the Harbor has also experienced significant sand accretion since reconstruction (specifically around the ramps, and approximately 50 feet east of the ramps). The cause of this accretion has not been determined, however it is possible that recent re-surfacing of the adjacent Gulf Road has caused increased run-off across the beach area south of the ramps. The sand may be both traveling across the ramps and washing down the ramps to form a sandbar. The Dartmouth Waterways Management Commission noted diminishing use of the ramps due to silt last summer and, without remedy, the ramp will be of limited use for deep draft launching in the future. Prior to dredging, it is first important to identify the source of the silt to ensure the problem is corrected.

While there are various shallow areas within the Harbor, Table 1 displays areas in the Harbor where an interest in dredging has been expressed⁷⁹, and Figure 11⁸⁰ contains a map of these locations.

⁷⁹ Data based on findings from the “2015 State of Our Harbors: An examination of Massachusetts Coastal Harbor Conditions and Related Economic Parameters”. Online at: <https://archives.lib.state.ma.us/handle/2452/724258>.

⁸⁰ *Ibid.*

Table 1: Potential Dredge Locations in Padanaram Harbor (“—” means information was not available)

Map ID	Dredge Location	Design Depth (feet)	Current Depth (feet)	Timeframe for Desired Dredging	Volume (cubic yards)
A	Padanaram Harbor / Apponagansett Bay channel	10	7	An immediate interest	—
B	New Bedford Yacht Club Basin	—	7.5	Within 5 years	2,000
C	Upper Apponagansett Bay	7	3	An immediate interest	2,000
D	Ramp at Arthur Dias Landing	—	6*	An immediate interest	—

*Within the past two boating seasons, a shallow “bump” has appeared off the end of the ramps that affects use by deep draft vessels in launching and hauling.

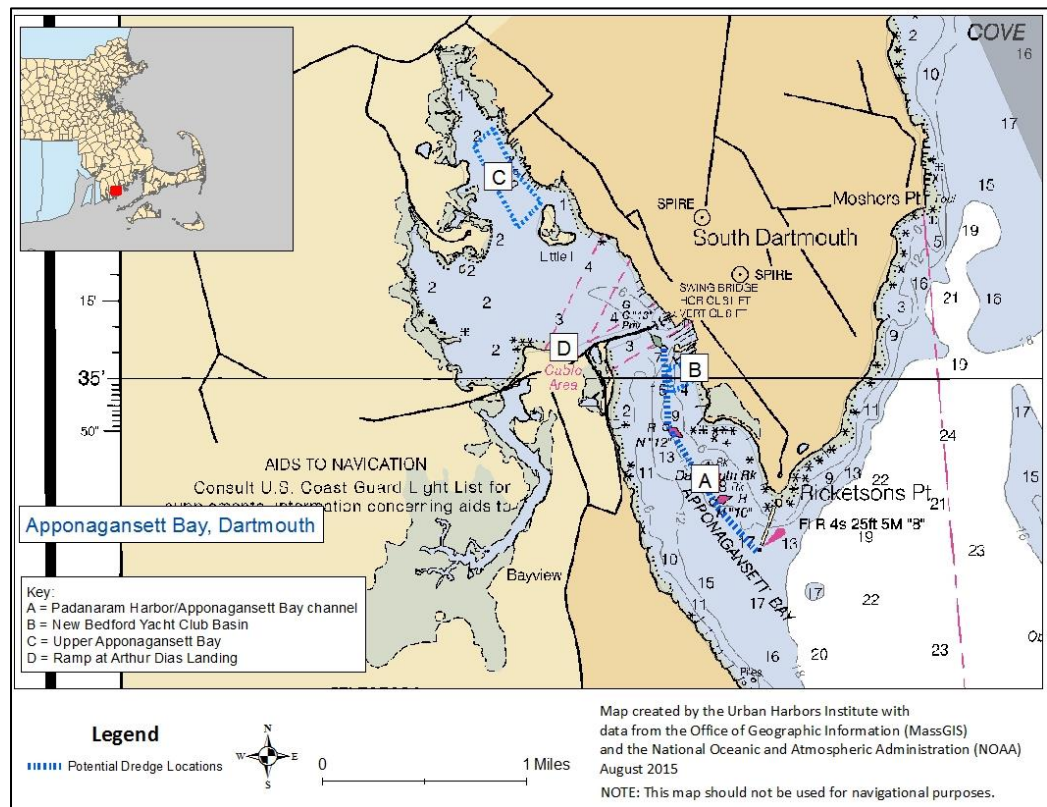


Figure 11: Potential Dredging Locations in Apponagansett Bay, Dartmouth.

It is important to note that, while Table 1 indicates an interest in dredging, it may not be feasible and/or realistic to dredge given the environmental conditions in that area (e.g., siltation rates) and/or costs associated with dredging. Additionally, the permitting process for dredging is often very complex and lengthy.

Some feel the northern portion of Padanaram Harbor has always been shallow, and therefore dredging may not be worthwhile; while others contend that the area is filling in with sediment from various sources throughout the watershed (e.g., storm drains, road runoff, yard runoff, and brooks connected to the Harbor). Harbor users also

suggested, in particular, a large amount of sedimentation north of the island in the Harbor.

Dredging the northern portion of the Harbor may increase the number of boats in the Harbor, which could result in the development of more private docks, conflicts with kayakers, impacts to water quality, and a call to open the bridge more frequently. Shellfish habitat is also present in the northern portion of the Harbor, and, in the short term, dredging could negatively impact that resource area. On the other hand, dredging the northern portion of the Harbor may increase the space available for moorings and reduce the mooring waitlist.

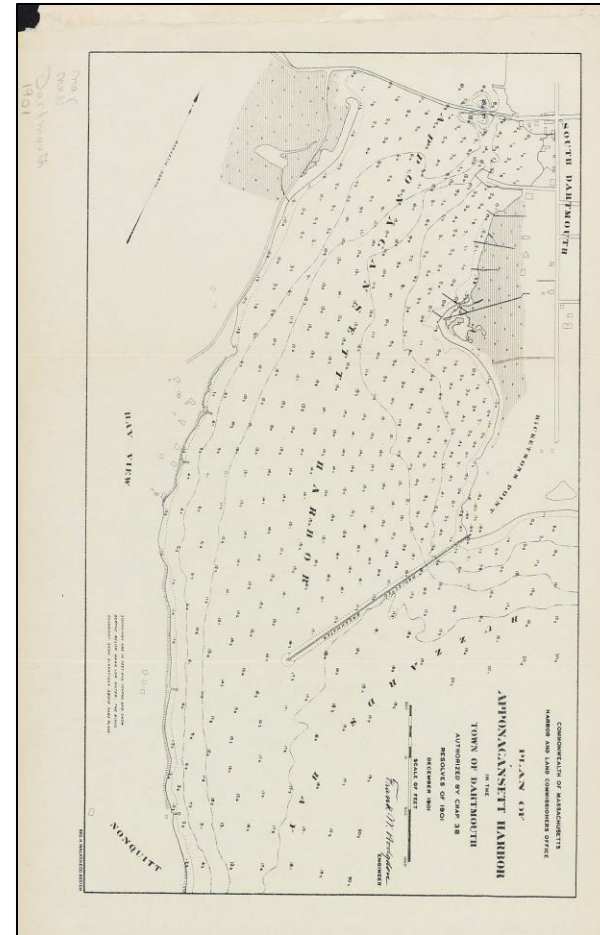
If dredging occurred at the New Bedford Yacht Club Basin, the Yacht Club could increase the number of slip and mooring rentals, accommodate more members, and host larger vessels.

If dredging occurred in the Apponagansett Bay channel, larger vessels could visit the Harbor, potentially providing new economic opportunities.

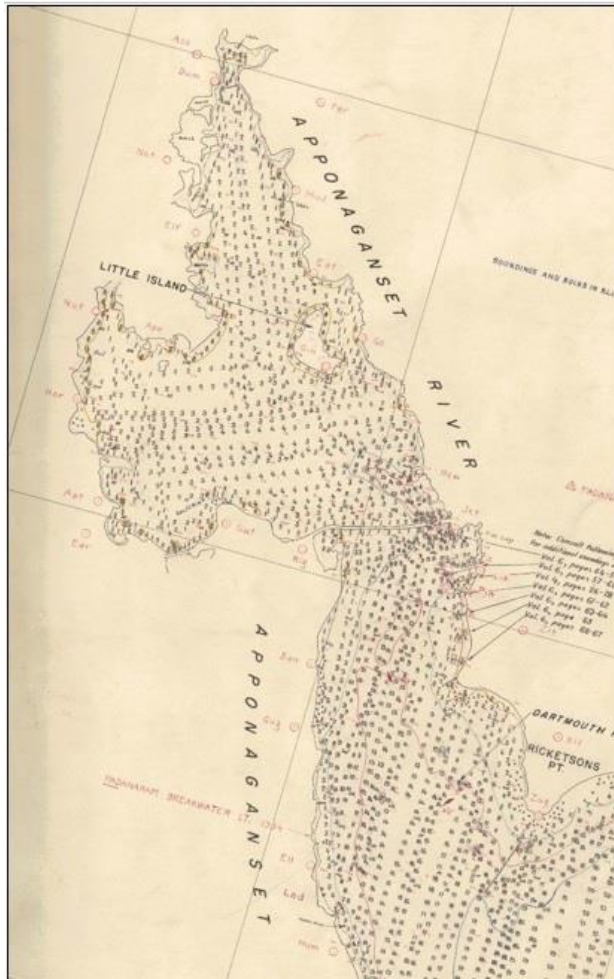
The six maps below, from between 1781 to 2010, display bathymetric measurements in the Harbor. Given the level of detail, these maps are difficult to view here, however the sources are listed below for those interested in viewing more closely.



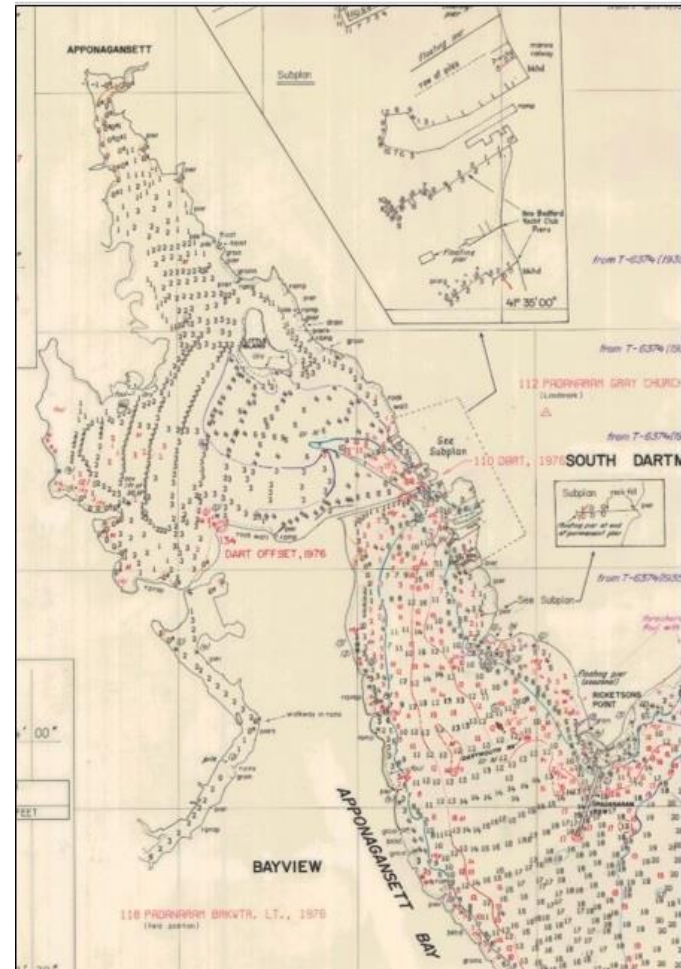
Date: 1781
Source: Boston Public Library



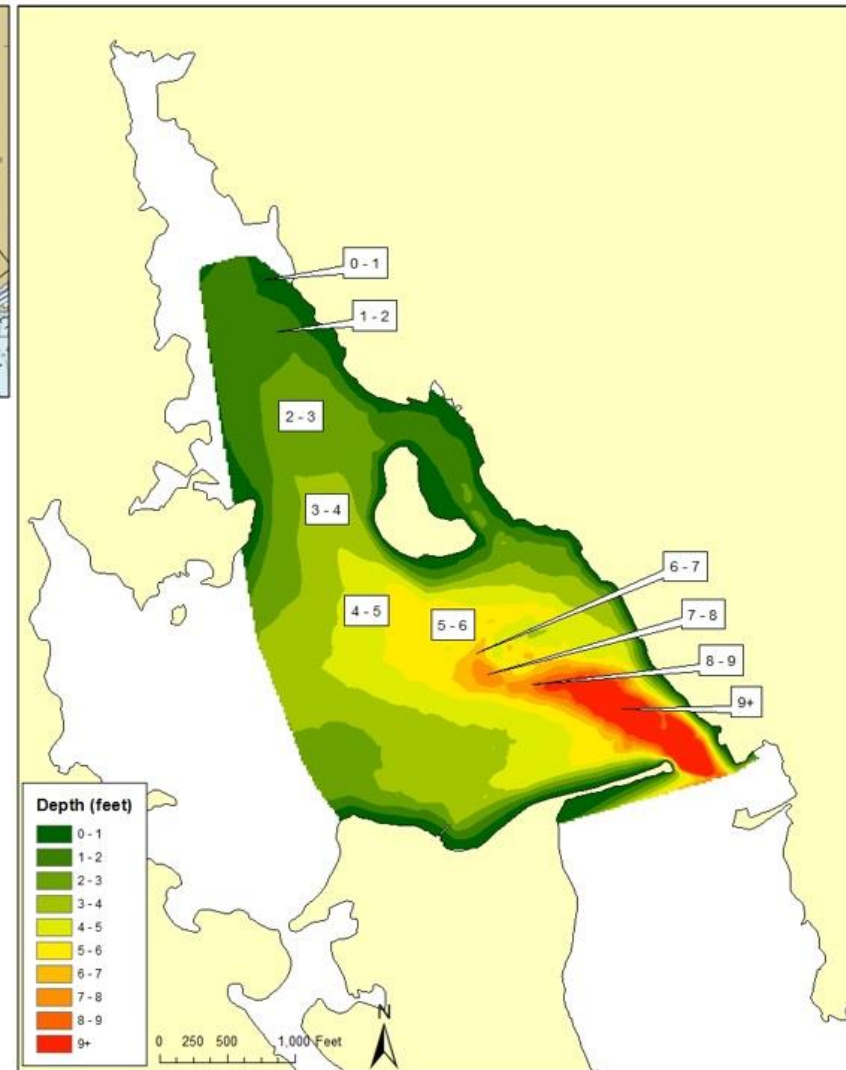
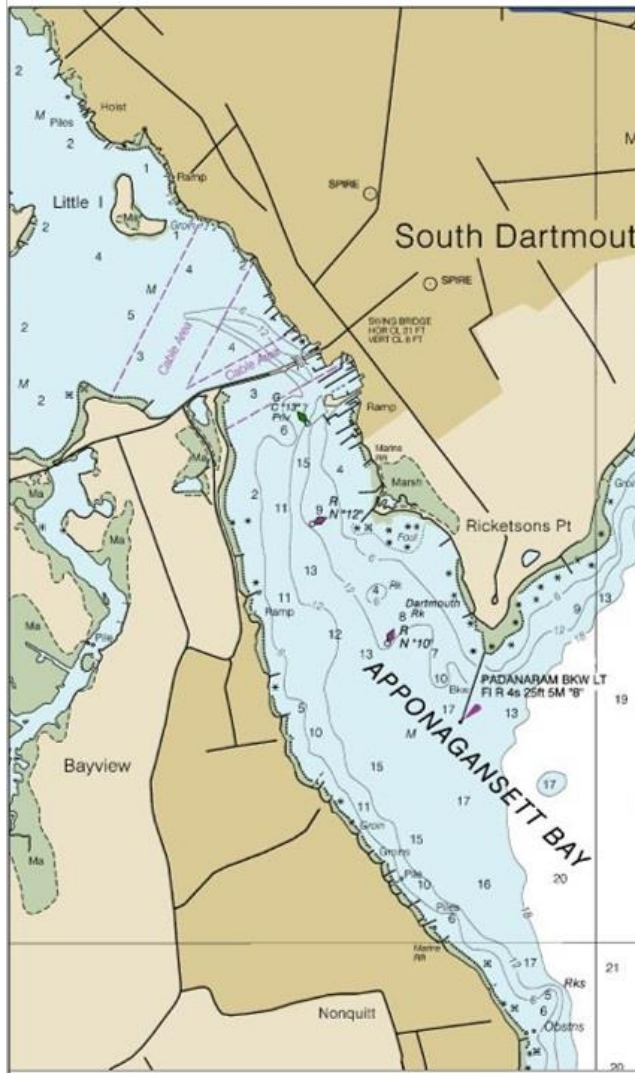
Date: 1901
Source: U.S. Army Corps of Engineers



Date: 1935
 Source: Source: National Oceanic and Atmospheric Administration, online at:
<https://www.ngdc.noaa.gov/nos/H04001-H06000/H05880.html>



Date: 1976
 Source: National Oceanic and Atmospheric Administration, online at: <https://www.ngdc.noaa.gov/nos/H08001-H10000/H09644.html>



Date: 2009
 Source: National Oceanic and Atmospheric Administration,
 online at:
<http://www.charts.noaa.gov/OnLineViewer/13232.shtml>

Date: 2010
 Source: Massachusetts Division of Marine Fisheries

COMMERCIAL USES

Note: Commercial fishing is addressed in the Commercial and Recreational Fishing section of this document.

Padanaram Village developed with a focus on the maritime trades, and Dartmouth continues its tradition of supporting local businesses with ties to the Harbor. To this point, the 2007 Master Plan states, “We value traditional local industries with ties to our natural resources. Farming, fishing and marine industries have long provided jobs for residents and rooted the community in a harmonious relationship with the land and sea. These industries should be supported—Dartmouth would not be the same without them.”⁸¹

While support of the whaling industry, ferry service across the Harbor, and the exportation of salt⁸² no longer play roles in the town’s economy, fishing, boat building, and boat-related services are still active commercial uses of the Harbor. Fishing activities in the Harbor include both commercial shellfishing and finfishing as well as shellfish aquaculture, as described more fully in the section on Commercial and Recreational Fishing. A handful of charter boats (approximately six as of January 2018) operate out of the Harbor, along with boat-based duck hunting charters.

Several marine-related businesses and services in Town support the various users of Padanaram Harbor and other nearby waterways. Table 2 describes those businesses and the services they provide.

In addition to the marine businesses listed above, the New Bedford Yacht Club provides its members with on-site launch ramps, a travel lift, 155 dinghy spaces, and 97 slips. Non-members have access to fuel and ice at the fuel dock, sailing classes, transient club use and transient moorings on a *per diem* basis, and can participate in races and regattas.

Boating activity in the Harbor supports a number of other area businesses as well, including divers, mobile marine service providers, sail makers, canvas and cushion fabricators, yacht brokerage companies, and those who sell and service marine electronics.

The services that these local businesses provide are integral to the economy of Dartmouth, and contribute to the area’s character, attracting people, both by land and by sea, to the shops in the Village. Many of these village shops and businesses are not water-dependent, but derive benefits from their proximity to the water such as increased pedestrian traffic.

Furthermore, launch lanes at Marshall Marine, the New Bedford Yacht Club, the South Wharf Yacht Yard, and the Town Ramp, along with related hauling providers and on-land

⁸¹ Town of Dartmouth. 2007. 2007 Dartmouth Master Plan.

⁸² Guha, A. 2014. Padanaram’s Rich History Flavored by Ship Building, Salt. SouthCoast Today. July 20, 2014. Online at: <http://www.southcoasttoday.com/article/20140720/news/407200321>.

storage locations are critical to the town’s ability to safely prepare for storms—which could intensify and become more frequent in the future as a result of climate change.⁸³

Table 2: Marine-Related Businesses and Services in Padanaram Harbor, Dartmouth, MA.

	Concordia Company	Davis & Tripp	Marshall Marine	South Wharf Yacht Yard / Cape Yachts	Pioneer Mooring
Address	300 Gulf Road	1 Bridge Street	55 Shipyard Lane	218 Elm Street	2 Atlantic Street
Service and storage	Yes	Yes	Yes	Yes	
Brokerage/Sales	Yes	Yes	Yes	Yes	
Ship’s store	Yes	Yes		Yes	
Repair and restoration	Yes				
Inspect and install moorings	Yes	Yes			Yes
Berthing rental	Yes	Yes	Yes	Yes	
Boat building			Yes		
Boat and kayak rental				Yes	

With commercial uses in and adjacent to the Harbor, however, come potential environmental stressors such as water pollution from chemicals common in the marine trades (*e.g.*, oil and gas, boat paints and varnishes), as well as other environmental concerns typical of any development, *e.g.*, increased impervious surfaces, loss of natural habitat. Many regulations, policies, and protocols already exist to minimize or prevent impairments of natural resources due to commercial uses.

⁸³ Frumhoff, P. C., J. J. McCarthy, J. M. Melillo, S. C. Moser, and D. J. Wuebbles, 2007. *Confronting Climate Change in the U.S. Northeast: Science, Impacts, and Solutions*. Synthesis report of the Northeast Climate Impacts Assessment. Cambridge, MA: Union of Concerned Scientists.

RECREATIONAL USES

This section covers all marine recreational uses except recreational fishing, which is located in the Commercial and Recreational Fishing section of this Harbor Plan. Recreational uses occurring along the waterfront edge on land, including biking and walking, are located in the Public Access Section.

The waters of Padanaram Harbor are used frequently for recreational activities, including boating, kayaking, jet skiing, fishing, swimming/wading, waterfowl hunting, and standup paddleboarding. Recreational boating in particular is a very common activity in Padanaram Harbor, and Figure 12 displays a sample of marine recreational boater routes in Padanaram Harbor which were collected through the most recent recreational boating survey, the 2012 Northeast Recreational Boater Survey⁸⁴. Because the boats surveyed were mostly deep-draft or larger boats, limited movement is shown for the northern portion of the Harbor. Other than the mooring area south of Little Island, much of that northern portion of the Harbor is shallow and restricts boating to shallow draft vessels.

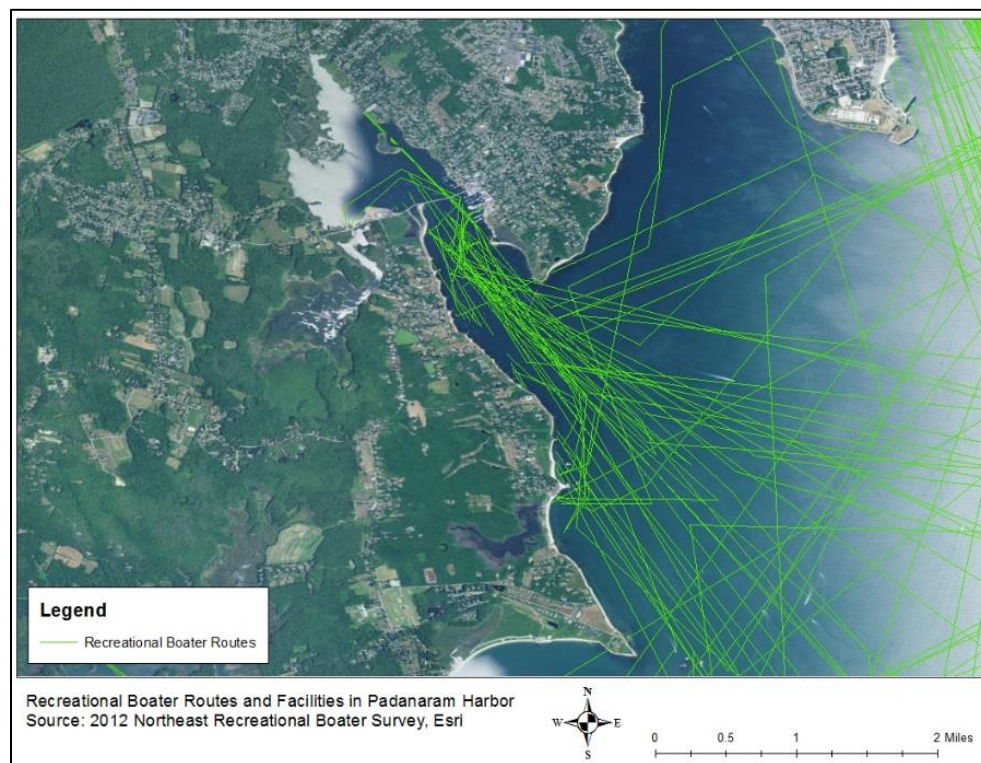


Figure 12: Recreational Boater Routes Collected through the 2012 Northeast Recreational Boater Survey in Padanaram Harbor.

The Harbor hosts a number of marinas, marine repair services, pump-out facilities, and a public boat launch. The public launch has two wide asphalt boat ramps with parking nearby. Buzzards Bay, including all of Padanaram Harbor, has been designated by the U.S. EPA as a No Discharge Zone, and pump-out locations include a town-maintained mobile pump-out vessel and a stationary one on the Harbormaster dock (to the north of

⁸⁴ A survey that collected spatial and economic data from over 12,000 recreational boaters from the Northeast.

the bridge on the east side). There is also limited parking available at launch areas and access points for small craft use.

The Harbor is a major tourism draw for the Town, and there are a few different mooring options for transient guests. There are approximately 930 moorings in total in the Harbor as seen in Table 3, provided by the Harbormaster Department.

2019 MOORING INFORMATION

Overview:

Dartmouth has approximately 81 miles of contiguous coastal shoreline in which the Dartmouth Harbormaster is responsible to protect and maintain. There are several areas designated as mooring fields in the Town of Dartmouth. The total number of moorings can change each year due to a variety of factors which can include but are not limited to:

- Adjustments in vessel length
 - Increase length – potential decrease in mooring numbers
 - Decreased length – potential increase in mooring numbers
- Moorings Relinquished
- Changes in contour of the Bay
- Increase in temporary dock float moorings
- Increased areas of new mooring installations

2019 Moorings by Location			
Location	Active	Inactive	Total
North of Bridge	337	24	361
South of Bridge	561	9	570
Nonquitt	58	1	59
Round Hill	11	0	11
Salters Point	48	3	51
Mishaum Point	28	10	38
Little River (outside)	4	0	4
Slocum River	37	1	38
Clarks Cove	37	0	37
TOTALS	1,121	48	1,169 **

** There are an additional 76 sites identified for assignment which have not previously been used as mooring locations. This brings the total amount of potential moorings to approximately 1,245.

Table 3: Details of mooring numbers within the Town of Dartmouth according to records of the Harbormaster Department

The mooring field in the northern portion of the Harbor was re-gridded during the past three years, which increased the number of available moorings in the Harbor and reduced the number of people on the mooring waitlist. There may be the option for additional shallow draft moorings north of the bridge, outside of the gridded areas. To date, the southern portion has not been regridded due to logistical and environmental reasons. Specifically, portions of the southern Harbor are underlain with ledge which precludes helix-type moorings, and there are patches of eelgrass that need to be protected. There is also a tradition/history of family moorings in the southern portion of the Harbor, and the owners are sometimes resistant to relocation.

More details on the boating facilities, including the amenities associated with those facilities, located in Padanaram Harbor can be found in Table 4, and a map of these facilities in Figure 13 below.

Table 4: Details on boating facilities and respective amenities located in and around Padanaram Harbor

MAP ID	FACILITY NAME	PUBLIC / PRIVATE	# SLIPS	# MOORINGS	# LAUNCH LANES	DINGHY STORAGE	FUEL
1	Marshall Marine Corp.	Private	0	0	1*	28	None
2	Davis & Tripp, Inc.	Private	80	10	1*	18	None
3	New Bedford Yacht Club	Private	97	0	3	155	Both gas and diesel
4	Concordia Company	Private	0	155	0	0	None
5	South Wharf Yacht Yard	Private	100	0	1	80	None
6	Arthur F. Dias Public Boat Launch Facility	Public	0	0	2	65**	None

* The Marshall and Davis & Tripp launch facilities require use of a lift.

**The dinghy rack at Dias Landing can hold up to 65 dinghies; kayaks may also be stored in the dinghy rack. The Landing also has a kayak “tree” rack which holds up to 8 kayaks or standup paddleboards.

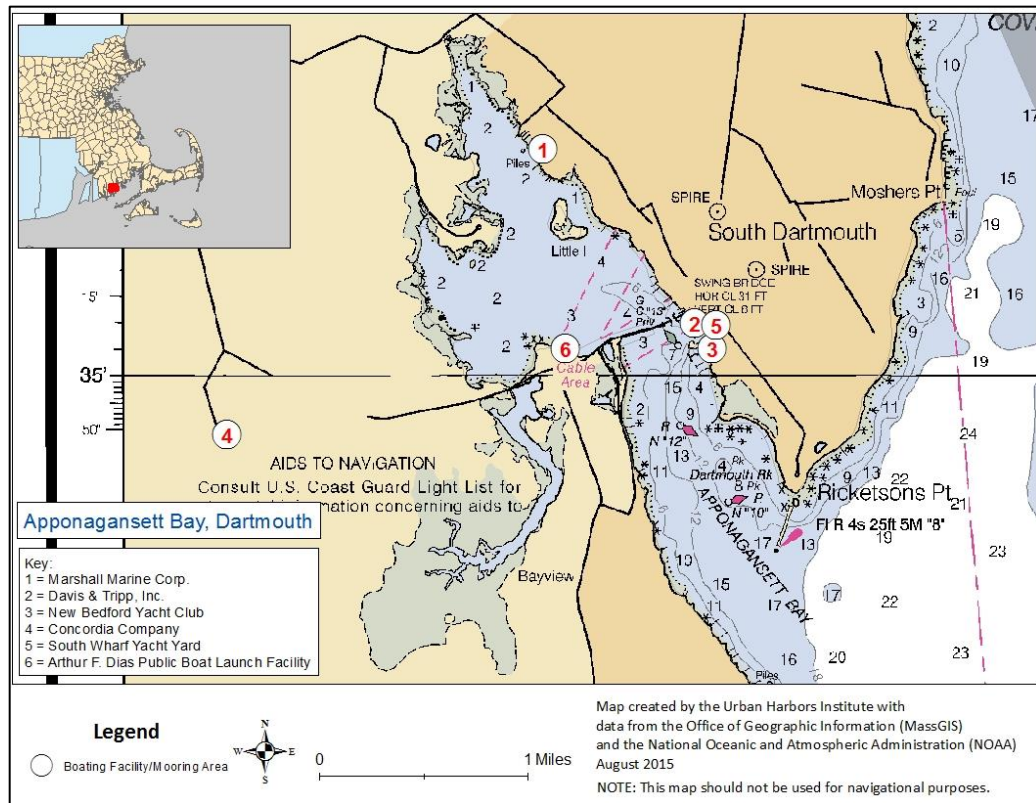


Figure 13: Location of boating facilities in and around Padanaram Harbor.

The New Bedford Yacht Club has 12 individual moorings for the club’s use (e.g., sailing school and support boats). Members of the club are assigned individual moorings in the harbor by the harbormaster through a waitlist. Accommodation of visiting boats is facilitated through the New Bedford Yacht Club, where the transient boater is assigned a mooring, temporarily vacated by a member, and pays a club use fee. The Town also has six moorings for transient boaters north of the causeway and two additional temporary moorings—one north and one south of the bridge—for temporary use while waiting for the bridge to open. These town transient moorings are free, first come, first serve, and need to be coordinated through the Harbormaster’s office.

The Harbor also is the base for numerous regattas (5–6 per year on average) involving the New Bedford Yacht Club (Buzzards Bay Regatta and club racing), Marshall Marine (catboat regatta), Stone Horse regatta, and more. In some instances, private properties around the Harbor are utilized for boat storage, launching, and parking for participants. Additionally, the New Bedford Yacht Club has a sailing program and school, which uses the north and south sections of the Harbor. The program is open to the public, conducts regattas, and engages 60–70 youths each day during the summer. Dartmouth High School has a successful inter-scholastic racing team that operates out of the New Bedford Yacht Club’s facilities. Most sailing occurs during the summer months, but historically there has also been a small group of Optimist sailors that intermittently use the Harbor in late fall, winter, and early spring.

Kayakers and paddleboarders are active within the Harbor, and are able to launch from the shoreline of the town landing and at street ends on the east side of the Harbor. At

the bottom of Hill Street, there is also a spot for launching kayaks, but it presents some difficulties in use because of steep stairs. There is limited on-street parking near the Hill Street Access point.

The Dartmouth Parks and Recreation Department has contracted with Osprey Kayaks of Westport, MA to provide kayak rentals and related activities at Apponagansett Park. This service is put out to bid annually and, consequently, the provider may change from year to year. Kayakers often paddle along the edges of the northern portion of the Harbor from the bridge to the very northern reaches. There is personal watercraft activity south of the bridge, but that area is considered less safe for kayakers due to the presence of power boats and larger vessels. Passing through the bridge area in personal watercraft can be difficult depending on the tidal flow and fishing activity on the bridge. There also is a paddleboard vendor occasionally located at Dias Landing.

Recreational fishing (including recreational shellfishing) is another common use of the Harbor. This activity is addressed in a separate section of the plan focused on fishing, shellfishing and aquaculture uses. There is little recreational snorkeling or SCUBA diving within the Harbor due to depths, water clarity, and boating activity.

A variety of recreational activities occur along the harbor's edge, including biking, walking, sightseeing, and others. These activities are discussed in the Public Access section.

COMMERCIAL AND RECREATIONAL FISHING

Dartmouth is steeped in a rich history of commercial, recreational, and sustenance fishing beginning with the earliest Native Americans and continuing through to today. The harbor’s rich fish and shellfish resources, coupled with its access to fertile offshore fishing grounds, made the area in and around the Harbor Plan planning area ideal for settlement and industry.

Once a harbor that supported a small whaling fleet of roughly seven whaling ships and several smaller support vessels,⁸⁵ most present-day fishing activity is recreational in nature. The Harbor does support a few commercial fishermen including a small number of lobster boats, charter fishing vessels, two commercial shellfish aquaculture ventures, and crab and conch vessels. A small number of individuals also launch their vessels in Dartmouth to offer charter services and harvest other commercially viable species, such as tautog, landing them in Town.

Records indicate that the pounds and value of landings in Dartmouth has fluctuated over the years, as have the numbers of harvesters and dealers (see Table 5), with quahog, scup, sea scallop, striped bass, and black sea bass comprising more than 80% of the species landed in Dartmouth between 2005–2016, by pound (of those that can be reported due to confidentiality issues with the data), as shown in Table 6. Though not listed in Table 6, other important species harvested locally include crab, eel, and sea worm.

Table 5: Dartmouth Commercial Landings (Live Pounds) and Ex-Vessel Value by Year, 2005-2016

YR	LANDINGS	VALUE	# OF DEALERS	# OF HARVESTERS
2005	53,650	\$77,397	7	23
2006	233,304	\$180,338	9	52
2007	208,197	\$164,599	8	35
2008	117,229	\$99,231	6	26
2009	89,321	\$97,984	6	54
2010	116,345	\$166,866	9	40
2011	65,170	\$86,752	9	26
2012	79,059	\$78,330	9	32
2013	77,719	\$97,810	9	29
2014	132,872	\$126,491	10	29
2015	66,151	\$147,237	9	54
2016	99,600	\$162,296	12	65
SOURCE: SAFIS Dealer Database				

⁸⁵ Old Dartmouth Historical Sketch Number 2: Traditions of Padanaram. 1903. New Bedford Whaling Museum. Online at: https://www.whalingmuseum.org/explore/library/publications/old-dartmouth-historical-sketches/odhs_no_2

Table 6: Dartmouth Landings by Rank and Species 2005–2016.

SPECIES	LBS	RANK
CLAM, NORTHERN QUAHOG	572,733	1
SCUP	351,471	2
SCALLOP, SEA	142,934	3
STRIPED BASS ⁸⁶	66,766	4
SEA BASS, BLACK	60,192	5
WHELK, CHANNELED	58,677	6
LOBSTER, AMERICAN	27,742	7
TAUTOG	17,123	8
OYSTER, EASTERN	13,913	9
MENHADEN	13,099	10
FLOUNDER, SUMMER (FLUKE)	5,421	11
WHELK, KNOBBED	2,651	12
BLUEFISH	1,574	13
SNAILS(CONCHS)	1,451	14
CRAB, JONAH	*	*
TUNA, YELLOWFIN	*	*
TUNA, BIGEYE	*	*
GOOSEFISH	*	*
SOURCE: SAFIS Dealer Database		
*Confidential Data		

The Harbor supported a commercial quahog fishery until the 1970s/1980s, at which point it declined likely due to a combination of environmental and market factors. Commercial municipal shellfishing licenses are still issued for softshell clams, mussels, quahogs, and oysters under a general license. Conch and scallop harvesting require their own separate licenses. The municipal shellfish regulations outline the days of the week and times of year for commercial shellfishing, and the catch limits and harvest methods, as shown in Table 7.

To supplement the natural population of shellfish in the Harbor, the town’s Harbormaster Department, with funding from the Bouchard Oil Spill settlement, conducts relays of contaminated quahogs from the Taunton River, placing these shellfish in a temporarily closed area of the Harbor. After a minimum of 90 days, during which time the relayed quahogs naturally purge themselves of bacterial contamination, they can be safely harvested. These quahogs serve as brood stock while undergoing depuration, further contributing to the local stock. The Town also conducts other shellfish propagation activities within the Harbor in order to seed areas for harvest,

⁸⁶ Members of the community expressed a belief that this is an under-representation of the actual pounds of striped bass landed in Dartmouth, which may be due to dealer reporting errors.

including placing approximately 100 bushels, on average, of quahog in the Harbor each year in the vicinity of Bush Point, Smith Neck Road, and Apponagansett Point.

Presently, the Town is exploring the potential for additional shellfish aquaculture, noting in the regulations that “Private aquaculture is a means to continue the long-standing tradition of protection and enhancement of the shellfish resources of the Town while reviving the commercial potential for local shellfish food sources in Dartmouth waters”.⁸⁷ The Town has issued a 0.5-acre lease site for commercial shellfish aquaculture, and others are going through the review and approval process. Dartmouth’s aquaculture regulations are summarized in Table 7.

Table 7: Municipal Shellfish Aquaculture Regulations in Dartmouth

Residency	Must be a Town resident for at least 12 consecutive months prior to the date of application, and must maintain residency throughout the terms of the license.
Fee	\$100 application fee, plus costs to advertise \$25.00/acre
Review and public comment	Application is forwarded to the Waterways Management Commission, Harbormaster, Shellfish Constable, Board of Health, and Conservation Commission for review and written comment A Public hearing is required Abutters within 500 feet of the outside boundary of the lease site must be notified of the application and hearing The Massachusetts Division of Marine Fisheries must certify the project
Size of licensed area	Not to exceed 0.5 acres
Number of licenses	An applicant may initially apply for two licenses. After three years of continuous licensed operation, a license holder may hold up to four licenses. After ten years of continuous licensed operation, there is no limit on the number of licenses a licensee may hold.
Location of licensed area	Must minimize adverse effects or harm to residents, waterways, the environment, flora, and fauna of the Town. A licensee may hold more than one license, and his/her licensed areas need not be contiguous.
Transferability	Requires prior written approval by the Select Board, and can be inherited by immediate family. Notice and hearing requirements apply to the transfer of a license.
Duration	Licenses may be issued and renewed for periods up to five years, at the discretion of the Select Board. Renewal applications may not be submitted sooner than two years prior to the expiration date of the license.
Reporting	Licensees must satisfy state report requirements according to M.G.L CH 130 Section 65 or 322 CMR 15.08(4) The Select Board also conducts annual reviews of each license to ensure compliance with all statutes, regulations, and license terms and conditions and evaluates productivity at the site.

⁸⁷ Dartmouth Aquaculture regulations. Online at:
https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/aquaculture_regulations.pdf.

Productivity	The Town requirement for productivity is a minimum yearly market value of \$1,500/acre (M.G.L. C. 130 Section 65. Counting of productivity will not begin until the third year of license issuance, but will continue through the renewal of a license. Productivity requirements can be waived for a year by the Select Board, upon written request when specific conditions are met.
Source of seed	From state-approved sources only
Marking of licensed area	Boundary mark floats must be placed according to specified requirements and license holder must register all grant markings with the US Coast Guard as private aids to navigation.
Buffer zones	No vessels or structures may be anchored, moored, or stationed within 50 feet of a license area or license area marker unless involved in the aquaculture operations. The Select Board may set buffer zones between license areas.
Insurance	Each license holder is required to maintain business liability insurance in the amount of not less than one hundred thousand dollars combined single limit for any occurrence, and worker's compensation insurance. Licensees may be required to post a performance bond to cover the cost of hear removal and site restoration.
Operation Limitations	No aquaculture operations may be conducted between one half-hour after sunset and one half hour before sunrise on the following day nor on any holiday upon which shellfishing is prohibited in Dartmouth.

The Town also has a vibrant recreational fishery that includes both finfishing and shellfishing. Those who fish with rod and reel can surfcast from areas such as Smith Neck Road, fish from the Padanaram Bridge, or travel by vessel to fishing sites both within and outside of the Harbor. Popular target species include bluefish, striped bass, flounder, scup, and tautog. A state-issued recreational saltwater fishing permit is required for those aged 16 or older, fishing in Massachusetts waters.

Town by-laws (Article III, Section 146-6) aim to allow recreational fishing from Padanaram Bridge in a manner that ensures "public safety and convenience...without infringing upon vehicular and pedestrian traffic." As such, the by-law prohibits the following:

- A. "Fishing, in any form, from the stone rip-rap, rocks and bridge abutments.
- B. Climbing upon or over any rails or fences of the bridge.
- C. Cleaning, scaling, gutting, dressing or filleting any fish upon the bridge and its sidewalks, walkways, roadways, railing, fence and decking.
- D. Consumption of alcoholic beverages on any parts of the bridge.
- E. Use of radios, stereos or other sound or music equipment in a loud manner so as to interfere with the peaceful enjoyment and use of adjoining residential and commercial properties.
- F. Use of radios, stereos or other sound or music equipment during the designated "Quiet Period" between 9:00 p.m. and 9:00 a.m. so that the sound may be heard in the residential and dock-berthing areas adjoining the bridge.
- G. Placing any objects upon the bridge area, including fishing rods, tackle boxes, pails, chairs, tables or other objects so as to impede or infringe upon the free flow of pedestrians and vehicular traffic and use of the bridge.
- H. The placing of or discarding of any trash refuse or litter on the bridge area or into the waters abutting the bridge.

I. Fishing from any areas of the bridge designated as "No Fishing" areas."

Despite existing regulations, fishing activity on the bridge can conflict with other bridge users as well as those on the water below the bridge. As such, the Town is exploring options for developing a fishing pier off of the south side of the causeway, as depicted in the conceptual drawing above (image provided by the Dartmouth Waterways Management Commission).

Many residents and visitors also participate in recreational shellfish harvesting for oysters, quahogs, softshell clams, and bay scallops. Designated Shellfish Growing Areas (DSGA) in or near the Harbor include five distinct classification areas by the State Division of Marine Fisheries (DMF). The five areas (see Figure 14) are designated as "Approved", "Conditionally Approved", and "Prohibited". North of the causeway to Little Island and the western shore is conditionally open to harvesting in winter months. The Eastern shore and north of Little Island is designated by DMF as "Prohibited" to all shellfish activity. The outer Harbor is primarily "Approved" for shellfish harvesting. Classifications are based largely on water quality standards set by the National Shellfish Sanitation Program (NSSP) Section 2 of Chapter 4.03 of the NSSP Guide for the Control of Molluscan Shellfish.⁸⁸

When necessary, the Town can close an otherwise approved area for management purposes, such as to allow contaminated seed to depurate, or to prevent depletion of stock in an area.

⁸⁸ U.S. Food and Drug Administration. 2015. National Shellfish Sanitation Program (NSSP): Guide for the Control of Molluscan Shellfish 2015 Revision.

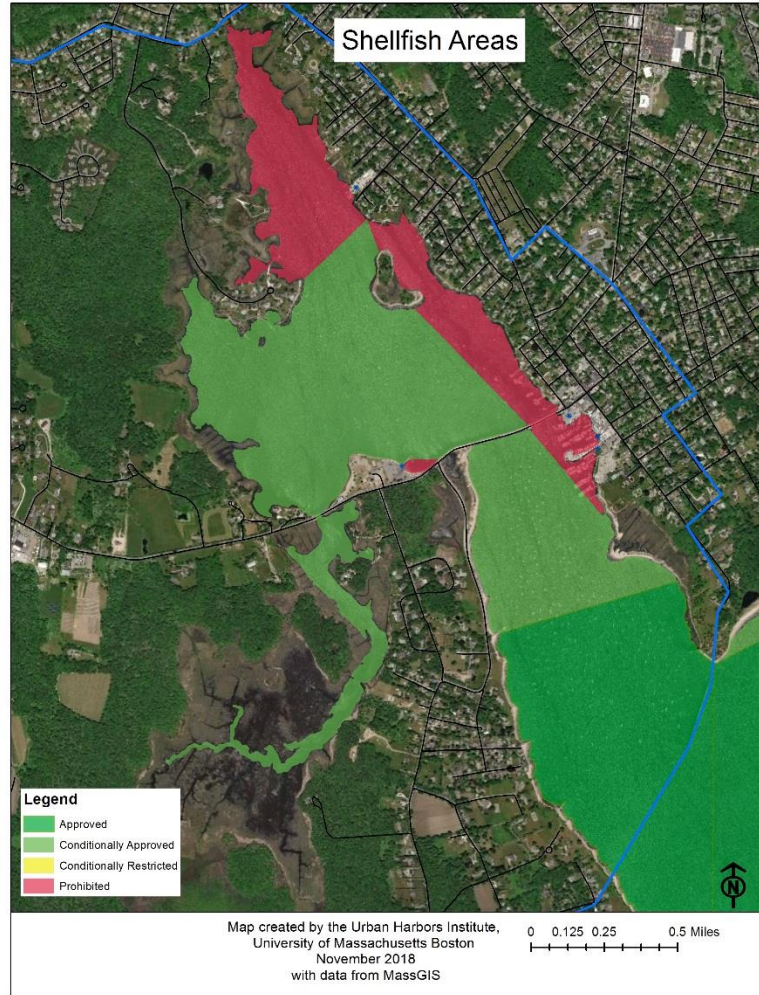


Figure 14: Shellfish area classifications in Padanaram Harbor.

Through its municipal regulations, Dartmouth directs recreational shellfishing in terms of when, where, and how shellfish can be harvested as well the minimum size and maximum quantity that can be taken, as shown in the table below.

Table 8: Dartmouth Shellfishing Abstract.⁸⁹

Dartmouth Shellfishing Abstract					
Type of Permit/License	Who may use it	Days of Week Restrictions (1)	Time of Year Restrictions	Catch Limits	Allowable Harvest Methods
Resident Recreational	Named permit holder and listed household members (2)	Softshell clams: Only on Tuesday and Saturdays Quahogs: only on Wed, Thurs, Fri and Sat. NOT on Sundays, Mondays or Tuesdays	Clams and Quahogs: only Harvested when air temperature is above 32°F on open days Oysters: may only be Harvested between Nov.1 and March 31	Soft-shell clams: one peck per week /permit Quahogs: 2 pecks (½ bushel) per week/per permit. No more than 50% may be "neck" (3) Oysters: 2 pecks (½ bushel) per week/per permit	Clams: by hand, clam fork, clam rake, clam hoe or hand-plunger Mussels, Oysters & Quahogs: by hand or hand rake. Oysters and Quahogs may only be harvested from areas of 6" water depth or greater Dry-Digging is prohibited
Non-Resident Recreational	By named permit holder only				
Senior Resident Recreational	By named senior (65+) and any household member under 16 YOA	Oysters: Only on Wed, Thurs, Fri and Sat.			
Commercial Resident License	18 YOA Resident w/ State Transaction Card	Softshell clams: Only on Tuesday and Saturdays Quahogs: only on Wed, Thurs, Fri and Sat. NOT on Sundays, Mondays or Tuesdays Oysters: Only on Wed, Thurs, Fri and Sat	Clams and Quahogs: only Harvested when air temperature is above 32°F on open days Oysters: may only be Harvested between Nov.1 and March 31	Soft-shell clams: one peck per week /permit Quahogs: 3 bushel per day/12 bushel per week. No more than 50% may be "neck" (3) Oysters: One Bushel per week/per permit	Clams: by hand, clam fork, clam rake, clam hoe or hand-plunger Mussels, Oysters & Quahogs: by hand, hand or bull rake, or tongs. Oysters and Quahogs may only be harvested from areas of 6" water depth or greater Dry-Digging is Prohibited
Resident Recreational Scallop Permit (non-commercial use only)	By named permit holder only	Wed, Thurs, Fri and Sat only (not Sun., Mon. or Tues.)	Only between October 1 st and March 31 st	One bushel per permit per calendar week, measured in-shell	By hand, hand-rake, dip-net, or towed dredge no wider than 36" and without teeth

All Harvesting is allowed only between 30 minutes after sunrise and 30 minutes before sunset. Landing must occur by sunset.
No Harvesting of shellfish is allowed by means of SCUBA or DIVING. No Power-Dredging or Commercial Scalloping is allowed in Dartmouth.
This abstract does not include information on CLOSED areas. You are responsible for knowing/understanding the status of each harvest area.

(1) No harvesting of any shellfish, eels or seaworms allowed on any official holiday of the Commonwealth.
 (2) "Household Members" are defined as spouse, dependents (per tax filing), listed on annual Town census form, living in same residence as permit holder.
The named permit holder must be physically present, supervise, and be responsible for activities of any household member acting under their permit.
 (3) "neck" is defined as quahogs with a hinge width measurement of 1" to 2½". No more than 50% of quahog catch may be neck-sized.

⁸⁹ Dartmouth Shellfishing Abstract. Online at: <https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/2017shellfishabstract.pdf>

PUBLIC ACCESS

Access to and from the Harbor has been critical for commercial and recreational reasons since the earliest inhabitation of the Dartmouth area. Early on, the Harbor provided a food supply and a basis for transportation. In more recent years the Harbor has evolved into a boating center with a sizable onshore support economy. The Harbor also is critical as a “sense of place” for Padanaram Village with its shops, restaurants, and businesses and as a visual focus in the important context of a seaside town.

As part of a survey of issues related to the Harbor and its management leading into this planning effort, respondents noted a wide range of types of access including:

- access to the shoreline for recreational activities such as boating, swimming, fishing and shellfishing,
- access from the water to the shore for boaters, both local and transient,
- access to onshore support businesses for boaters,
- visual access to the waters and the activities that take place there, and
- access to shoreside facilities such as restaurants, shops, parks, and historic sites that are enhanced by their proximity to the water.

There are differing opinions as to whether or not the Town, including access to its shore and the related support services, should be promoted as a regional destination or should be targeted primarily for townspeople. Some have expressed concerns that increased or improved public access should not adversely affect the privacy of local residents or affect private properties or commercial activities.

One of the major issues with public access is: Who comprises the public for whom access is to be provided? Is it local residents, or does it extend to regional, state, or national options? This question is touched on in the Dartmouth 2007 Master Plan⁹⁰ where the Community Values section includes,

“WE value the small town feel that endures within a community that has gained big town attractions. Attention must be paid to the delicate balance of these two traits, with new development integrated in a manner that doesn’t sacrifice small town connections.”

Under Section 8, Goal 9 of the Master Plan, the following objectives are identified:

- 9.1 Complete a Harbor Management Plan
- 9.2 Inventory public access points
- 9.3 Promote public access to the shoreline through permitting processes

Current Conditions and Management System

Town Owned or Managed Access Facilities

⁹⁰Town of Dartmouth. 2007. 2007 Dartmouth Master Plan.

Arthur Dias Boat Landing

The Arthur Dias Town Landing (Figure 15) is located north of the causeway on the west side of the Harbor. It offers two paved launch ramps for trailered boats and beach access for launching of paddle craft and other vessels that can be launched by hand. There is parking for vehicles with trailers (~50) and those without (~30) at a current parking/launch fee of \$5 per day or \$50 for the season. Parking areas for those with handicaps are provided. Per the Harbormaster’s web site, “There is no cost to enjoy the view from your occupied vehicle.”

Because of an agreement made in the 1960s, the Landing is operated under the regulations and policies of the Massachusetts Public Access Board (PAB). These require equal access to all residents of the Commonwealth—but do not extend similar access to residents of other states. Operationally, it has proven difficult to determine the residency of users of the facility and an unquantified number of non-Massachusetts residents may utilize the Landing from time to time. While issuance of a seasonal pass could be scrutinized in the same manner as beach passes, *i.e.*, having a “gate guard”, enforcing Massachusetts residency for day-passes would be difficult and labor-intensive. The arrangement with the PAB also precludes having a common pass for the Dias Landing and town recreational areas such as Apponagansett Park or other town beaches.

Funding from the PAB in 2013/2014 improved the launch ramp—increasing it to two lanes and adding the middle float. The PAB has not been involved in the construction, upkeep, or renovation of the pier and associated float. These were upgraded in the same 2013/2014 period using funds from the town’s Waterways Enterprise Fund.



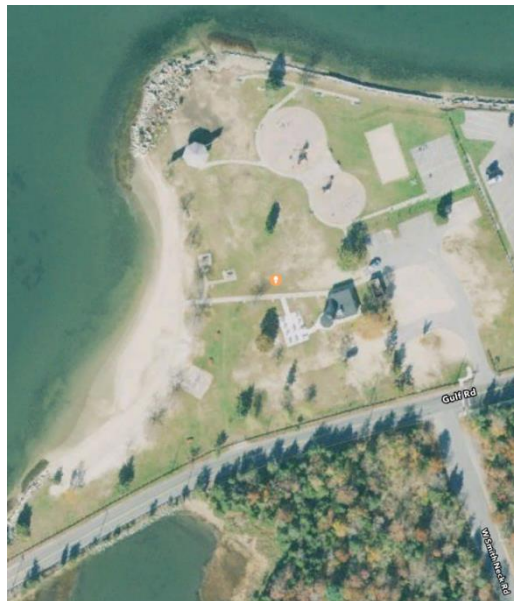
There is small vessel (kayak, dinghy, etc.) storage available for some 60 craft at an annual fee of \$50. This money goes to the Waterways Enterprise Fund administered through the Harbormaster Department. Fees for use of this storage may be set by the Town as it falls outside the jurisdiction of the PAB. Unfortunately, in 2017, there was damage to the racks and some kayaks were stolen. In 2018, a new dinghy storage rack (of stronger construction) and a kayak rack were added to the Landing facilities.

The site is adjacent to Apponagansett Park so there is walking access to rest rooms and a food concession. The Landing is heavily utilized during the summer boating season and on particularly busy weekends the parking areas overflow onto West Smith Neck Road (a public road) or Apponagansett Park (a town facility).

The Waterways Management Commission has discussed increasing the small vessel storage racks as well as establishing a small, town-operated seasonal marina at this site, but this is in the conceptual, discussion stage as of late 2018. Any such facility would necessarily be limited to boats with shallow draft or dinghies, due to water depths. However, it might provide some relief to the crowded mooring area north of the causeway and offer ready access to boats and dinghies. Neither of these would involve the PAB and fees could be set by the Town.

Apponagansett Park

Apponagansett Park is located on Gulf Road close to the west end of the causeway, directly abutting the Arthur Dias Boat Landing. According to the Town of Dartmouth Public Parks and Beaches Division web page, the site “offers scenic harbor views, a sandy beach area, gazebo for small functions, picnic area, volleyball court, playground equipment and basketball court. Lifeguards are on duty 9 am to 5 pm from July 1st through Labor Day. The park is open year-round to the general public.... The Ice Cream Bucket located on site is open mid-May through Labor Day for ice cream and light fare.” Not mentioned, but available at the Park, are vehicular parking and bicycle racks.



Fees apply during the summer season for parking and special events. Apponagansett Park has received State funding and is open to all. Parking is available through either a daily or seasonal, fee-based beach and parking pass. There are separate fees for residents and non-residents. Special events such as the evening concerts are open to the general public for a fee. During summer holiday periods or some special events (e.g., evening concerts) parking needs may exceed on-site capacity. In the past, some of the overflow has been accommodated at the adjacent Dias Landing facility or on West Smith Neck Road.

During 2018, there was construction to improve the patio and tables at the food concession.

Maritime Center

In February of 2017, the Town received a \$1 million grant award from the Commonwealth of Massachusetts Seaport Economic Council for the development of a Maritime Center on the east end of the causeway. The design is for a small (~530 square foot), single-story building to function as a transient boating-related facility. As such, it will include bathrooms and shower areas as well as a multi-purpose room that will be used as a welcome center and seasonal office for the Harbormaster. Five parking spaces

will be created—including a reserved space for handicapped access. A storage rack for small vessels is proposed, as is an aluminum gangway to dockage in the location of the current Harbormaster pump-out dock. The existing, deteriorated launch facility will be upgraded and there will be an observation deck running parallel to the bridge.

As of January 2019, the Maritime Center is nearing completion and is expected to be in full operation by the late spring of 2019.

Management of the facility has been defined in a Memorandum of Understanding (MOU) dated September 19, 2016. According to the MOU, the facility will be owned by the Town “in the custody and control of the Select Board.” The existing pump-out station, pier, gangway and proposed floating docks will be “in the custody and control of the Waterways Department.” The Dartmouth Department of Public Works will maintain the parking area and signage and will be responsible for trash removal. Opening and closing of the bathrooms will be done by the bridge tender and the Select Board’s Office will provide custodial service. The facility is designed to be open daily from Memorial Day through Columbus Day from 6 am–9 pm.

The Maritime Center may well serve as a hub for exploration of the Village and the harbor areas. Kiosks with walking tours, illustrations of the types of boats in the Harbor or the natural resources present in and around the Harbor, lists of nearby historic sites, directions to shops and restaurants, etc. could make this a stopping point for visitors from boats or by land, as well as for townspeople.

[Bridge/Causeway](#)

One of the most significant features of Padanaram Harbor is the causeway and bridge, extending westward from Padanaram Village, which bisect the waterway. Historically, the bridge has provided scenic access to crossing drivers, bicyclists, and pedestrians and is a heavily used fishing area.

The causeway and bridge were constructed in the early 1800s. Beginning in 2016 and extending into 2018, renovation work was done on the causeway that, among other things, has improved sidewalks for pedestrian access. This sidewalk extends some 400 feet south along the east side of Smith Neck Road and connects to improved sidewalks along Gulf Road to the Apponagansett Park and the bridge over Dyke Creek (aka Salt Creek).

Over the years there have been conflicts between pedestrians (and, in some cases, vehicular traffic) and fishing activities on the causeway. Trash, residue from cleaning of fish, and other materials sometimes litter the walkways. A fish cleaning station has been constructed near the bridge and trash receptacles are provided but not always properly utilized. Chairs occupied by fishers may block passage by pedestrians and back casts from those fishing can injure others. As a result of these issues, the Waterways Management Commission is exploring the establishment of a fish pier extending perpendicular to the causeway into the harbor waters. The intent is to provide a location for fishing while removing these activities from conflicts with foot and vehicle traffic, as described in the section on Commercial and Recreational Fishing.

[Street Ends](#)

On the east side of the northern portion of the Harbor, several street layouts appear to reach the water’s edge. These include (from south to north):

- Hill Street,
- Gladys Street,
- Day Street,
- Howland Avenue,
- Cottage Street,
- Shipyard Lane,
- Highland Street, and
- Lucy Street.

If some or all of these street ends are town property, they could be utilized for access to the Harbor—as locations for visual access, small boat launching, or other similar, low-impact uses. Presently, there is a stairway to the water’s edge at the bottom of Hill Street where a number of kayaks and dinghies are stored during the summer months.

[Head of Bay at the Pump Station](#)

At the extreme north end of the Harbor, south off Russells Mills Road, is a Department of Public Works pump station. It sits on small rise overlooking the Harbor and offers a panoramic view of the waters, associated salt marsh, wildlife, and maritime activities. A Veterans Memorial bench has been placed there, honoring Lieutenant Cleaveland Bridgman. There is parking for a limited number of vehicles. The adjacent waters are shallow and the bottom is soft mud so it unlikely that this site will be utilized for water access.



Other Access Options

Shoreline Access via Chapter 91

In Padanaram Harbor, as in most of Massachusetts, waters below the mean low tide line are the property of the citizens of the Commonwealth, held in trust and managed by the State. Private property generally extends to the mean low tide line but the public retains certain rights in the intertidal zone—that area between the mean low tide line and the mean high tide line. Specifically, these are the rights of “fishing, fowling, and navigation.” People participating in these activities have the right to pass over private lands within the intertidal zone.

When an individual or business seeks to undertake construction in public waters below the high tide line (*e.g.*, a dock, pier, or bulkhead), a license is required from the Massachusetts Department of Environmental Protection (MA DEP) under the provisions of Mass. General Law Chapter 91, aka the Public Waterfront Act. Given that such projects involve private use of public waters, and the land under those waters, the MA DEP licenses require certain public benefits be provided.

Additionally, legal findings have established that lands that historically were tidal but have subsequently been filled retain certain public rights. (These rights have been codified in the regulations pursuant to Chapter 91.) In this situation, public access may be required over what are now upland areas as part of the State licensing process.

Such licenses relate to the impacts on filled or flowed tidelands “owned” by the Commonwealth, consequently the licensing process is under the jurisdiction of the MA DEP—a state agency. The Town, however, has the right to submit comments (and the MA DEP encourages such comments) through the Planning Board, on any license application for a project within the Town.

In reviewing license applications for small, residential docks, the MA DEP will seek to maintain lateral access along the mean high tide line for existing public rights and for strolling, minimize impairment of sight lines for navigation, and limit the extension into the waters to that similar to existing structures adjacent to the site.

There are several parcels with historically filled tidelands on the east side of the Harbor running south from the bridge to the New Bedford Yacht Club. Two of these are working boatyards, one is a condominium and the fourth is the Yacht Club itself. Each of these facilities has a license mandating some level of public access. However, some of these licenses are dated and somewhat vague as to the portions of the properties open for public access. As of early 2018, MA DEP has indicated that it is reviewing at least some of the licenses. It is hoped that this review will more clearly define the public access on these parcels.

In 2017, the Dartmouth Pathways Committee developed a conceptual “Harborwalk” around various portions of the Harbor, including a walkway across the four parcels mentioned above. This proposal engendered some public debate and the Planning Department was charged with coordinating any further discussions on the topic between the Town and the MA DEP. It would be feasible for the Town to develop its preferences for access to these areas in order to balance the legal access by the public with the safety and privacy issues related to working boat yards and other activities on filled tidelands. However, at time of this writing, it is unclear whether the MA DEP would incorporate town wishes into its licensing process.

There does not appear to be any comprehensive inventory of the structures within the Town that hold (or once held) licenses under Chapter 91. Consequently, the Town does not have an inventory of the public benefits to the townspeople that are established by the licensing process.

Smith Neck Road

In 1913, the Town of Dartmouth acquired a 50'-wide right of way that became the segment of Smith Neck Road running south from the causeway/Gulf Road to Bay View. This area has historically been used for a number of public access purposes. The Dartmouth Conservation Commission owns a 5-acre parcel that runs approximately .25 mile along the water-side of the Road south from the causeway. This property is utilized for parking, launching of small craft, sun bathing, and shellfishing. The Town also owns a small, .16-acre, parcel between Smith Neck Road and the Harbor.

On the western side of the road, running south from Gulf Road, the Dartmouth Natural Resources Trust (DNRT) owns and manages the ~30 acre Knowles Reserve with a walking path through primarily salt marsh habitat and adjacent uplands.

The segment of Smith Neck Road in close proximity to the water provides clear visual access to the Harbor and its activities. Many walkers and bicyclists use this area and many automobiles slow, or park, to admire the view. The mix of pedestrians, bikers and potentially distracted drivers can lead to conflicts—although, thankfully, there have been a minimal number of recorded accidents. The shoulder on the water-side is soft so pedestrians, particularly those with strollers, generally stay on the pavement. The paved area of the roadway is less than 30 feet in width so there is limited space for this mix of users.

The Dartmouth Pathways Committee has developed a concept design for installing a sidewalk along the water-side of the roadway. Because the current paved portion hugs the water-side of the road layout, establishing a sidewalk would require moving the roadway itself a few feet to the west. Abutters to the road have expressed initial concerns to the proposal, suggesting a need for further discussion prior to any action on the concept.

Most of this section of the road is at a low elevation, such that it is over-washed during significant storms and water approaches the edge of the pavement in the highest tides of the year. The potential for storm damage to any road/sidewalk reconstruction must be considered in the design for work in this area. In the case of major damage to Smith Neck Road, the Town might consider connecting West Smith Neck Road to Smith Neck Road at the “s-curves” to the south of the segment adjacent to the water as an alternative traffic route.

Padanaram Village

The Village is the most densely developed portion of the Harbor planning area as well as the site of significant commercial and business activity. During 2018, considerable road and sidewalk construction was done to improve both traffic flow and pedestrian movement through the central portion of the Village, and to provide a few additional parking places. In recent years, the sidewalk along Elm Street was completed, linking pedestrian traffic between the Village and Russells Mills Road at the site of the former police station.

The most significant issue raised regarding access in and around the Village is parking—and where one stands on parking depends on one’s vision for the Village. For some, the vision is to maintain the status quo and to “keep things small”. Others see the opportunity to become a destination for shops, restaurants, boating activities, and passive recreation such as walking or bicycling. Parking is limited, even for the *status quo* option and the current situation would be extremely stressed with further development that did not also address parking needs. During at least two popular events in the Village parking is provided at a removed site(s) and shuttle busses provided. It is unclear whether this might be available on a regular basis.

Overnight parking (11 pm–6am) on several streets around the Village is restricted to residents only. These include Seaward Lane, Prospect Street, Hill Street and Water Street. This is based on action taken in 2001 by the Select Board at the recommendation of the Dartmouth Police Safety Officer and Chief. The concern leading to these restrictions was long-term parking (“weeks to months”) and crowding around driveways and intersections, particularly during the summer months. Subsequent to approval of the restrictions, there was a system established whereby residents on the named streets could get stickers through the office of the Select Board to allow overnight parking. In 2018, calls to both the office of the Select Board and the Town Clerk indicated no current knowledge of the stickers or other process to indicate residency. It is unclear if, or how, the residents-only limitations are presently being implemented or enforced.

Depending on the vision of the future of the Village, it may be necessary to improve parking capacity. Some options that have been raised include:

- Removal of the former fire station on Bridge Street, presently utilized by the Parks Department, and establishment of a parking area in its place.
- Investigating the possibility of use of the parking facilities of churches in the area on days when activities are not being held there. Some form of shuttle service might be necessary, depending on the distance or existence of sidewalks or other safe walking capacity.
- Investigating the use of school parking areas during the summer months when classes are not in session. Due to the distances involved, some form of shuttle service would be required.
- Making some of the side streets off Elm Street one-way and using the lane formerly used for traffic as parking sites.

Visual/Scenic Access

To many residents, visual access to the Harbor, its resources, and the activities that take place there seem as important as physical access. The Dartmouth Open Space and Recreation Plan notes the views from Apponagansett Park and the Conservation Commission land on Smith Neck Road as “outstanding” while the Massachusetts Scenic Inventory of 1988 identifies all of the harbor area views as “distinctive”. Many of the scenic vistas are synonymous with the areas for physical access, however a few additional spots are worthy of note:

- The view of the northern portion of the Harbor from the Russells Mills Road pump station,

- The view of the Harbor, causeway, bridge, and Village from Smith Neck Road,
- The view of the mooring area just south of Little Island from Hill Street,
- The view from the pocket park on the water-side of the condominiums at 280 Elm Street, and
- The view south from the Bridge over Dyke Creek (aka Salt Creek) on Gulf Road.

An inherent issue related to visual access derives from the development and redevelopment of houses on the east side of the northern Harbor. Any new or major reconstruction of houses in that area must meet the requirements of the State building code, which include requirements for elevating structures in flood-prone areas. This results in waterside homes being elevated higher than those set back from the water's edge, which can block views of the water from both private homes and public ways. Several of the commercial buildings in the Village have a similar "walling off" effect.

Scenic Roads

A number of roadways within the Harbor planning area fall under the provisions of Article 87, Section 87.1 of the Dartmouth Bylaws, including Bakerville Road, Rock O Dundee Road, and Smith Neck Road. This bylaw seeks to avoid disturbance of trees and stone walls along the designated ways in order to preserve the traditional look of the rural sections of the Town. None of these are in the immediate vicinity of the Harbor, but all add to the visual context of the area.

LIVING MARINE RESOURCES

Wetlands

Wetlands are one of the most productive ecosystems in the world and support numerous aquatic and terrestrial species of plants and animals through all or part of their life cycle.⁹¹ Wetlands have numerous important biological, chemical, and physical activities and characteristics, including wildlife habitat and food chain support, surface water retention or detention, groundwater recharge, and nutrient transformation.⁹²

Dartmouth wetlands support numerous animals species, such as raccoons and deer, and bird species, including wood (*Aix sponsa*), mallard (*Anas platyrhynchos*) and black ducks (*Anas Rubripes*), gadwall (*Anas strepera*), double-crested cormorant (*Phalacrocorax auritus*), Canada geese (*Branra Canadensis*), and osprey (*Pandion haliaetus*), which breed and feed in the wetland habitats of Dartmouth.⁹³ These species rely on local wetlands for a variety of functions, including the provision of food, water, and shelter, especially during migration and breeding.⁹⁴ Beyond the wetlands, Padanaram Harbor also serves as an important habitat for various fish species, including winter flounder (*Pseudopleuronectes americanus*). The Harbor also is host to occasional visits from harbor seals (*Phoca vitulina*) and even a rare sighting of a humpback whale (*Megaptera novaeangliae*).

In addition to natural functions, wetland ecosystems also provide value based on society's use and assessment of the wetland resources, including support for commercially valuable fish and wildlife, flood control, drinking water supply, enhancement of water quality, and recreational opportunities.⁹⁵

Since 2000, the Dartmouth Conservation Commission has managed three significant wetland restoration projects throughout the Town, including one project, the Padanaram salt marsh, which is located within the Harbor planning area on Smith Neck Road, directly south of the causeway.⁹⁶ The 10-acre Padanaram salt marsh restoration project was selected and funded by the New Bedford Harbor Trustee Council as one of several restoration projects that would serve as off-site mitigation for prior pollution in New Bedford Harbor.⁹⁷ The project consisted of replacing an old, damaged, undersized culvert with a new, properly-sized arch culvert to improve tidal flushing to the salt

⁹¹ Commonwealth of Massachusetts. No date. Massachusetts Wetlands. Online at: <https://www.mass.gov/service-details/massachusetts-wetlands>

⁹² *Ibid.*

⁹³ Town of Dartmouth. 2015. Open Space and Recreation Plan 2015-2022.

⁹⁴ Environmental Protection Agency. 2017. Why are wetlands important? Online at: <https://www.epa.gov/wetlands/why-are-wetlands-important>

⁹⁵ Commonwealth of Massachusetts. No date. Massachusetts Wetlands. Online at: <https://www.mass.gov/service-details/massachusetts-wetlands>

⁹⁶ Town of Dartmouth. 2007. Dartmouth Master Plan. Online at: https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/2007_dartmouth_master_plan.pdf

⁹⁷ New Bedford Harbor Trustee Council. 1998. Final Restoration Plan/Environmental Impact Statement for the New Bedford Harbor Environment.

marsh system, which was being encroached upon by *Phragmites australis*.⁹⁸ The project was completed in May 2003.⁹⁹

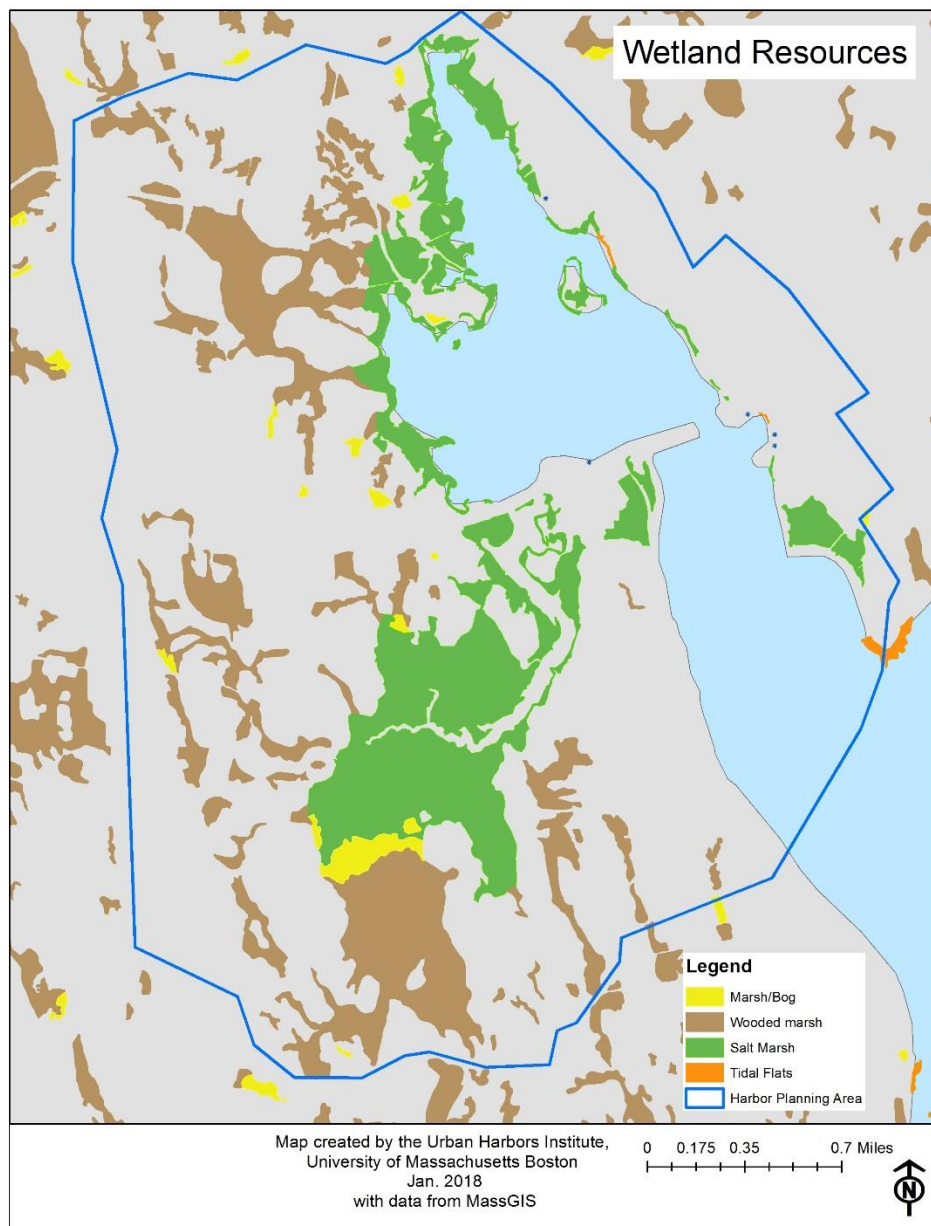


Figure 15: Wetland Resources in Padanaram Harbor, Dartmouth, MA.

Areas of salt marsh are found throughout the northern portion of the Harbor, particularly on the northern and western shoreline, as well as large patches in the southern portion of the Harbor directly south of the causeway on the western shoreline and south of the New Bedford Yacht Club on the eastern shoreline (see Figure 15). In addition, large areas of salt marsh and wooded marsh as well as smaller areas of marsh/bog are located inland on the western side of the Harbor.

⁹⁸ *Ibid.*

⁹⁹ Town of Dartmouth. 2015. Open Space and Recreation Plan 2015-2022.

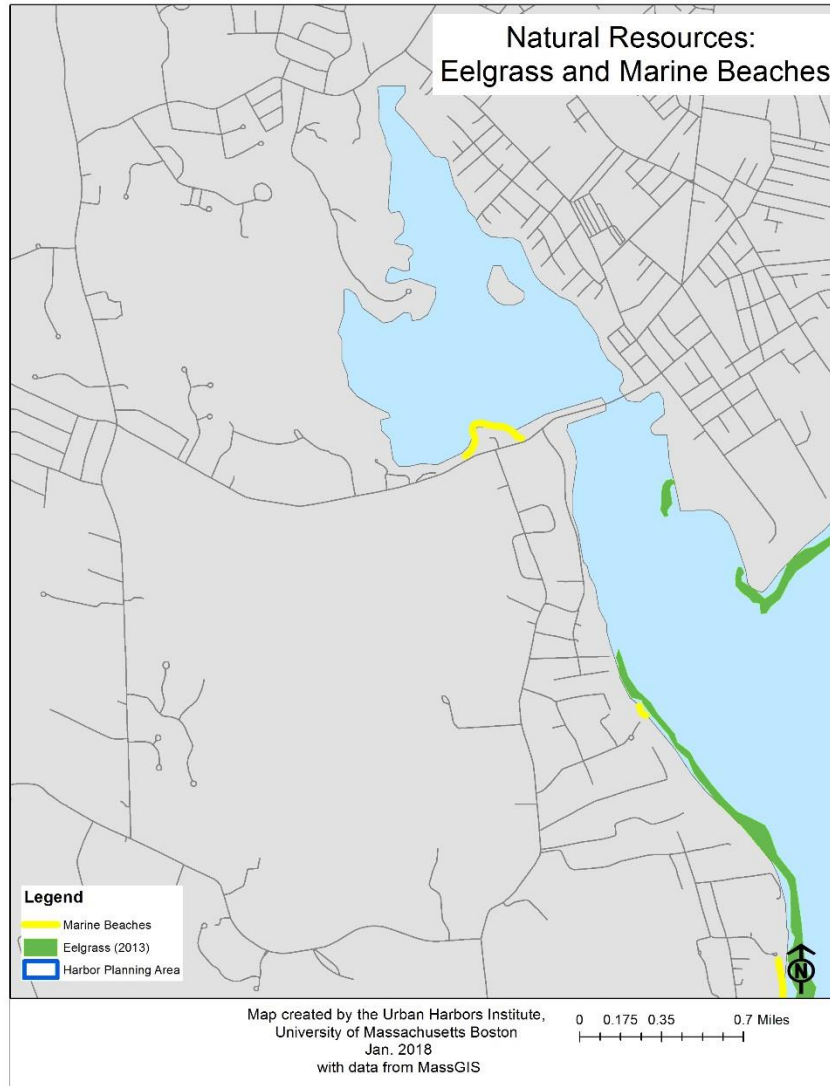


Figure 16: Natural Resources in Padanaram Harbor.

The limited eelgrass areas found within the Harbor planning area are primarily located on the western shore near the entrance to the Harbor (see Figure 16). Eelgrass geographic distribution and productivity is controlled by numerous factors, including temperature, light, substrate, desiccation, siltation, nutrient availability/excess loading, grazing, and boating/mooring activities.

Padanaram Harbor and the surrounding region has suffered significant historical eelgrass losses. Prior to development in the area, eelgrass likely colonized the majority of shallow areas with suitable salinity in Buzzards Bay.¹⁰⁰ In the 1930s, eelgrass largely disappeared in Buzzards Bay and across the Atlantic region due to a “wasting disease”, although the causes are not fully understood.¹⁰¹ Eelgrass in some areas of Buzzards Bay

¹⁰⁰ Buzzards Bay National Estuary Program. 2013. Buzzards Bay Comprehensive Conservation and Management Plan Update 2013. Online at: <https://buzzardsbay.org/newccmp/buzzards-bay-ccmp-2013-update.pdf>

¹⁰¹ *Ibid.*

never recovered after this loss. Eelgrass began to regrow in some areas, only to be devastated by a powerful hurricane in 1938.¹⁰² Eelgrass continued to recover and reached healthy levels in some areas during the 1960s to 1980s; however, from the 1980s to 2000s, scientists observed new declines in eelgrass.¹⁰³ These more recent declines appear to be caused by human disturbance and pollution, particularly nitrogen.¹⁰⁴ As a result, eelgrass in these areas is unlikely to recover until nitrogen inputs and other disturbances are reduced, creating significant management concerns.¹⁰⁵

Freshwater Input

Padanaram Harbor receives freshwater input from two brooks in the northern part of the Harbor, Buttonwood Brook to the east crossing Elm Street and Apponagansett Brook (aka Vincent Brook) to the west near Cushman Lane. Both brooks experience low flow and no flow conditions. This inconsistent freshwater presence may impact the local plant and animal life which must adapt to these conditions and/or find alternate sources of water.

Essential Fish Habitat

Essential Fish Habitat (EFH) is defined in the Magnuson-Stevens Fishery Conservation and Management Act as the waters and substrate needed for fish to spawn, feed, breed, and grow to maturity.¹⁰⁶ Protecting and restoring these areas is essential to maintain healthy fish populations and restore depleted fish stocks.¹⁰⁷ Padanaram Harbor is designated as EFH for 23 species at various life stages (*i.e.*, eggs, larvae, juvenile, adult), including black sea bass, scup, northern shortfin squid, longfin inshore squid, Atlantic mackerel, bluefish, Atlantic butterfish, spiny dogfish, Atlantic surfclam, summer flounder, smoothhound shark, sand tiger shark, Atlantic wolffish, winter flounder, little skate, Atlantic herring, Atlantic cod, pollock, red hake, silver hake, white hake, windowpane flounder, and winter skate.¹⁰⁸

Endangered, Threatened, and Special Concern Species

The Massachusetts Endangered Species Act (MESA) classifies 53 species in Dartmouth as Endangered (10), Threatened (19), or of Special Concern (24).¹⁰⁹ These species include one amphibian, one beetle, ten birds, 13 butterflies/moths, two crustaceans, two dragonflies/damselflies, two reptiles, and 22 vascular plants.¹¹⁰ Through MESA, the

¹⁰² *Ibid.*

¹⁰³ *Ibid.*

¹⁰⁴ *Ibid.*

¹⁰⁵ *Ibid.*

¹⁰⁶ Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. §1801 et seq.

¹⁰⁷ NOAA Fisheries. No date. Essential Fish Habitat. Online at: <https://www.habitat.noaa.gov/protection/efh/newInv/index.html>

¹⁰⁸ NOAA. No date. Essential Fish Habitat Mapping Tool. Online at: <https://www.habitat.noaa.gov/protection/efh/efhmapper/>

¹⁰⁹ Massachusetts Division of Fisheries and Wildlife. No Date. Rare Species by Town Viewer. Online at: <https://www.mass.gov/service-details/rare-species-by-town-viewer>

¹¹⁰ *Ibid.*

Massachusetts Division of Fisheries and Wildlife (DFW) regulates the protection of rare species and their habitats.¹¹¹

Ospreys

Surrounding Padanaram Harbor are several osprey nests, with some nests built on natural formations and others built on man-made nesting platforms. Mass Audubon is a leader in regional osprey conservation, research, and education through the South Coast Osprey Project. Although this project does not currently include the osprey nests in Padanaram Harbor, Mass Audubon continues to be an excellent source of information for residents interested in installing osprey nesting platforms on their properties. Mass Audubon can explain the considerations of installing such a platform and provide the specifications for construction. In the past, Mass Audubon has offered workshops where residents can learn this information, and a number of the platforms in the Harbor planning area were built as a result of this program. These nesting platforms serve as an attractive alternative for the ospreys to prevent them from nesting on other important town structures, *e.g.*, electrical poles or ballpark/playing field lights. Residents interested in installing a nesting platform on their property need to check with the Dartmouth Conservation Commission regarding town requirements. Ospreys and their nests also are protected by federal law under the Migratory Bird Treaty Act (16 U.S.C. §§703-712).

¹¹¹ Massachusetts Division of Fisheries and Wildlife. No Date. MA Endangered Species Act (MESA) Overview. Online at: <https://www.mass.gov/service-details/ma-endangered-species-act-mesa-overview>

DOCKS AND PIERS

As of late 2017 there were approximately 80 docks within the planning area for Padanaram Harbor—mostly relatively small residential docks but also including commercial and public dockage such as Davis & Tripp, South/Heritage Wharf, the New Bedford Yacht Club, and the Dias Landing.¹¹²

There is a similar number of waterfront lots in the planning area without docks, though that count is based solely on the number of lots adjacent to the water and does not account for local conditions that might preclude dock construction; consequently, the potential for future docks is probably somewhat less.

Figure 17 shows the location of existing docks and sites where permits have been issued by the Dartmouth Conservation Commission but construction has not yet begun.

While it is possible to determine how many docks are in existence, the Town does not have a comprehensive listing of the structures with Chapter 91 licenses. Efforts to identify and obtain Chapter 91 Licenses as part of the Harbor Planning process, in partnership with MA DEP, yielded licenses for only a portion of the docks and piers in Padanaram Harbor. It is unclear as to whether licenses have not been properly obtained by landowners or if MA DEP's records are incomplete. The lack of a complete record of Chapter 91 licenses makes it difficult to tell whether an existing structure has, or is consistent with, a Chapter 91 license. Further, there is no concomitant inventory of, or the ability to evaluate compliance with, the public access benefits provided through these licenses to the citizens of the Commonwealth.

¹¹² Michael O'Reilly, Dartmouth Environmental Affairs Coordinator, Pers. Comm. 2017.

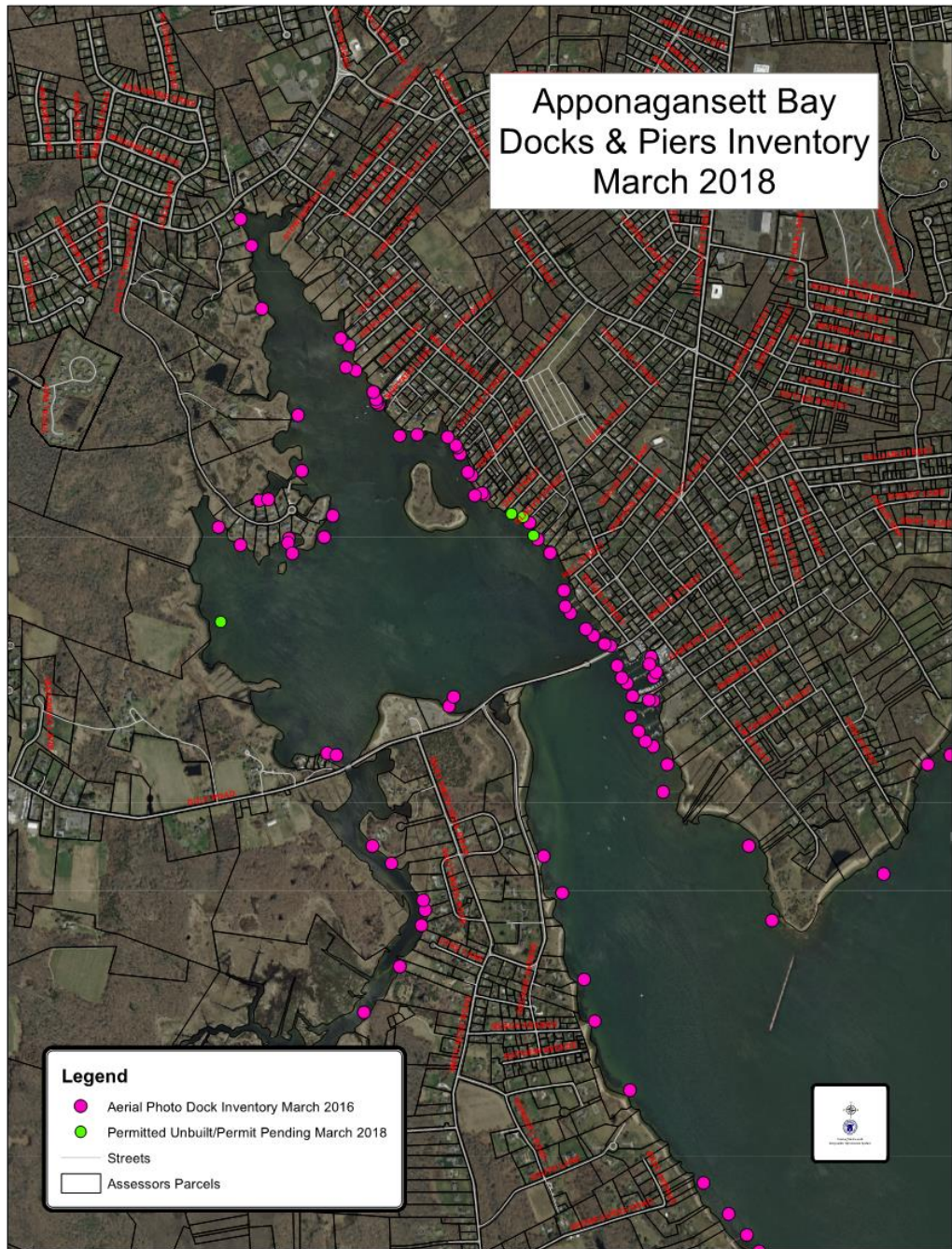


Figure 17: Docks and Piers Inventory, Padanaram Harbor.¹¹³

Current Conditions and Management System

In Massachusetts, the most significant review of environmental impacts from docks comes through the State Wetlands Protection Act MGL. C. 131, § 40 and corresponding regulations at 310 CMR 10.00 *et seq.* This state law is administered locally by the Dartmouth Conservation Commission. Specifically, it provides for a review of potential

¹¹³Map provided by Dartmouth Environmental Affairs

adverse impacts on environmental interests such as “land containing shellfish”, “salt marshes”, “protection of fisheries”, and “land under the ocean”. Dartmouth also has a local Wetlands By-law and Wetlands Regulations. The Dartmouth By-law includes all of the interests protected by the state law and adds “... recreation, and aesthetics”. Within the Town of Dartmouth Wetlands By-law, there is a section providing concerns, standards, and the review process to be met by proposed piers, docks, and floats. Applications for a specific dock proposal under both the state and local wetland rules and regulations must be treated individually—no effective mechanism is available for considering cumulative impacts of multiple docks. Docks are not reviewed under any sort of local zoning provisions.

Because docks extend into waters held in trust for the Citizens of the Commonwealth, the impacts on public access and usage of these waters is overseen by a state agency—the MA DEP), Division of Waterways under the provisions of MGL Chapter 91, The Public Waterfront Act, and its associated regulations 310 CMR 9.0 *et seq.* These are designed to protect the public’s rights in the harbor’s waters as well as lateral access in the intertidal zone for the purposes of “fishing, fowling, and navigation.” The regulatory standards provide for passage under, over, or around any structure extending through the intertidal zone.

The MA DEP has established a General License for “non-commercial, water-dependent, small scale docks, piers and similar structures that are accessory to residential use”¹¹⁴ that offers an expedited process for projects that meet certain criteria.¹¹⁵ Those criteria provide specific dimensional and structural requirements necessary to qualify. Whether a proposed dock qualifies for the General License is a decision that can be made by the Planning Board after the acceptance of public comment and an optional hearing. Besides the dimensional limits for the General License, there are two other aspects for consideration; the Board can determine whether “cumulative impacts” of the dock disqualify it for the General License (although no numerical standards or other means of defining cumulative impacts are provided) and the dock in question may not extend “substantially” beyond neighboring structures. If the Planning Board determines that the proposed dock does not qualify for a General Permit, the applicant must apply to the MA DEP through the Standard Licensing process. The Town Planning Board then has the opportunity to develop comments from the Town and submit them to the MA DEP for consideration.

¹¹⁴ MGL Chapter 91 §18c(a)

¹¹⁵ Information available at www.mass.gov/how-to/ww-06-12-chapter-91-simplified-license-license-renewal

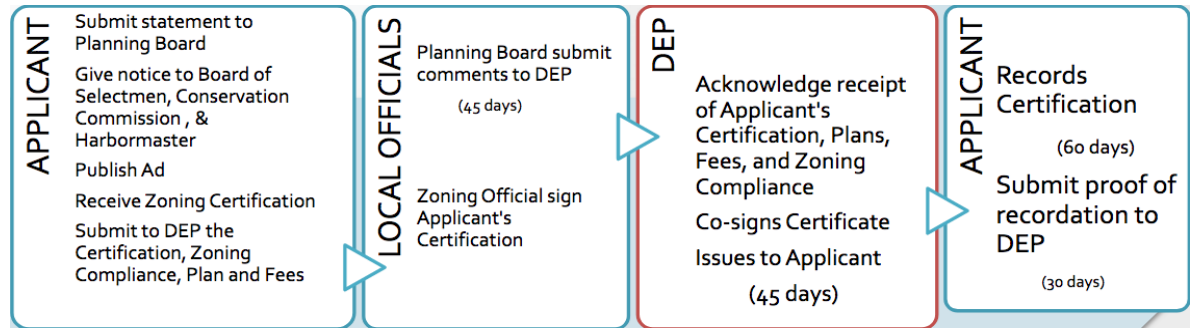


Figure 18: The General License application and review process.¹¹⁶

The Dartmouth Wetlands Regulations preclude impacts to mooring areas or navigation to, from, and around mooring areas. Section G, Performance Standards of the Dartmouth Wetland By-law pertaining to piers, docks and floats states, “piers shall not require the elimination of existing public or commercial moorings, nor shall they project into or impede navigation to and from mooring areas.” Under this regulation, “public” moorings are those permitted by the Harbormaster and utilized by individual boat owners, as opposed to those permitted to commercial entities and rented to individual boat owners.

Presently, there is no formal definition of “mooring areas” for the purposes of this by-law—although the gridded moorings in the northern portion of the Harbor might well be considered to fit that description. There are several other segments of the northern Harbor where groups of moorings occur and there might be conflicts with proposed docks (*e.g.*, to the east of Little Island or north and south from the Marshall Yard on the eastern shore). Further clarification of “mooring areas” and the associated navigational needs might lessen conflicts between such activities and proposed dock construction.

In making its decision on the appropriate design of a proposed dock, the Conservation Commission relies on comments from the Harbormaster Department as to potential impacts on moorings and shellfish. This takes time away from those staff people performing their regular tasks. Funding for the Department does not cover these additional tasks.

Private, residential docks are not typically addressed by the U.S. Army Corps of Engineers (the “Corps”). Although the Corps does have authority over such structures under the Rivers and Harbors Act, they delegate reviews and licensing to the State under the provisions of a General Permit. The Corps’ General Permit provisions do not apply to commercial dockage where space is rented or sold to customers. In this latter case, a Corps review and permit would be necessary.

The typical image of a residential dock or pier consists of a pile-supported walkway extending from an upland area out into the water, where a ramp connects with a float that moves up and down with the tide. The float may be anchored to the bottom by chains or some other flexible tethering system, or it may be held in place by pilings allowing it move with the tide. Depending on the design and location, either sort of float may sit on the bottom during low tide periods. This has the potential to cause adverse

¹¹⁶ From a DEP Waterways Division presentation at the Massachusetts Association of Conservation Commissions Annual Meeting, 1 March 2014
www.mass.gov/files/documents/2016/08/ss/macc2014genlc.pdf

impacts on bottom vegetation, shellfish or other bottom-living species important to the support of fisheries.



The images above show a float anchored to the bottom (left) and a float held in place by pilings (right).

Pile-supported structures in coastal waters are considered “permanent” and are regulated as such by the MA DEP under the licensing provisions of Chapter 91. Bottom anchored floats, however, are considered seasonal under Chapter 91 and more akin to a boat mooring than a permanent structure. They are subject to annual approval by the Harbormaster under the provisions of Section 10A of Chapter 91. A reasonable fee is charged and deposited into the Waterways Enterprise Fund.

In recent years, some “floats as docks” have been installed in Padanaram Harbor. These consist solely of bottom-anchored float segments that come close enough to the shoreline so as to avoid the need for any upland connection. By eliminating any pile-supported structure, there is no need for a Chapter 91 license, simply annual approval by the Harbormaster. Because of its design, however, this sort of “dock” will sit on the bottom at low tide with potential impacts to shellfish and/or sedimentation. Figure 26 below shows an example of a dock of this construction. It should be noted that, as floating structures, such “docks” do not pass to a new owner when the property is sold as would be the case with fixed docks.



Image: Dartmouth Environmental Affairs

Conservation Commission policy, based on recommendations from the Massachusetts Division of Marine Fisheries, is to have floats associated with docks come no closer than 30" to the bottom. In shallow water situations, this is generally accomplished by the use of float stops on pilings or cables.

Dock construction and continuing use can have adverse impacts on shellfish as recognized and described in both the local and state wetlands regulations. Management options have varied over past years including the harvesting and replanting of all shellfish within the construction zone of the dock or making a donation to help support the town's shellfish propagation program, reflecting the loss of shellfish themselves or potential shellfish habitat. (The Town has established a "shellfish seed account" to improve the shellfish populations within the Harbor and this account has been used to accept donations.) A standard dollar-amount formula has not been established for the value of shellfish affected by dock construction or usage by the Town.

Currently dock licensees pay an "occupation fee" to the MA DEP for the area in public waters displaced by the presence of their private docks. It is possible to petition the MA DEP to revert these fees to the Town for use on harbor-related activities. These fees are small, but with increasing numbers of docks, larger proposed dock areas, and over time, such fees might help augment programs such as the shellfish seed account.

From the project proponent's perspective, the permitting process for docks can seem protracted and unclear. In part, this is due to the varying regulatory interests and agencies responsible for making decisions on the project. Orders of Conditions must be obtained under both the state Wetlands Protection Act as well as the town Wetlands Protection By-law. A license must be obtained from the MA DEP under the provisions of the Public Waterfront Act (Chapter 91). The Dartmouth Planning Board has the option to submit comments on the Chapter 91 process, including input from other local interests—all of which adds to the amount of time a project may take.

As noted, MA DEP has recently developed a General License which simplifies the process for residential docks below specified size thresholds which provides standards to be met to protect public use of and access to waterways. Under the two Wetlands Protection programs however, the Conservation Commission must respond to the individual proposals and must make decisions under the provisions of two differing regulatory standards.

There is some interest in exploring whether this process might be somehow streamlined at the local level, both to speed the decision-making and to provide more predictability as to the final regulatory outcome.

FLOODING AND CLIMATE CHANGE

Padanaram Harbor has a long history of flooding and storm-related damage, including storms such as the hurricane of 1938, Hurricanes Carol and Edna in 1954, Hurricane Bob and the “Perfect Storm” in 1991, Tropical Storm Irene in 2011, Hurricane Sandy in 2012, and three back-to-back nor’easters in early 2018. In fact, between 1978 and 2016, 364 storms struck Buzzards Bay.¹¹⁷ Residents will remember the many impacts of these coastal storms, including widespread power outages, coastal flooding, and damage to shoreline infrastructure and vessels.

Existing Flood Conditions

Much of the Harbor planning area, including multiple pump stations, is located in the Federal Emergency Management Agency’s (FEMA) high risk areas, known as “special flood hazard areas”. These areas are shown in Figure 19. Areas within the AE Zone are within the 100-year floodplain, meaning there is a 1% chance of flooding each year, or a 26% chance of flooding over the life of a 30-year mortgage. Areas within the VE Zone are subject to wave action in addition to the 100-year flood. Those areas identified as within Zone X are areas of moderate flood hazard, and are less subject to flooding than the VE and AE zones.

The harbor’s location and orientation make it prone to storm surges, especially when strong storms have southerly winds. Storm surges in Padanaram Harbor are usually small; however, large hurricanes can bring storm surges of 25 feet,¹¹⁸ depending on factors such as the wind speed, size of storm, angle of approach, tide at which the storm hits, and forward speed of the storm (see Figure 20). While specific storm surge data for Dartmouth are not available, the Massachusetts Hazard Mitigation Plan notes that the configuration of Buzzards Bay causes funneling of the storm surge, causing higher flood levels as water moves into the narrowing upper reaches of the Bay.

Hurricane Bob, in 1991, caused flooding and damage to Dartmouth. The pictures below show boats washed into the causeway, and flooding at the New Bedford Yacht Club.



Images: Hank Seaman, Standard-Times



¹¹⁷ Zhang, Z., Chen, C. Beardsley, R.C., Li, S., Xu, Q. 2018. Climate Vulnerability Assessment on Potential Flooding of Apponagansett Bay and Clarks Cove, Dartmouth Town, MA.

¹¹⁸ Comprehensive Environmental, Inc. 2015. Local Multi-Hazard Mitigation Plan, Town of Dartmouth. Online at:

https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/final_dartmouthhazardmitigationplan.pdf.

In particular, the Local-Multi Hazard Mitigation Plan, 2015 Update for Dartmouth calls attention to the following “high hazard areas” in the Planning Zone:

- Russells Mills Road and Padanaram causeway: According to the plan, these two roads are highly susceptible to coastal flooding and storm surge. In the event of a storm, water from Buzzard’s Bay is driven into Padanaram Harbor and could potentially flood Gulf Road and the causeway across the Harbor as well as Russells Mills Road. In this event, emergency access routes can be extended as many as eight miles.
- Smith Neck Road and Gulf Road (near the causeway): These low-lying areas, including the channel, are subject to flooding during storm events.

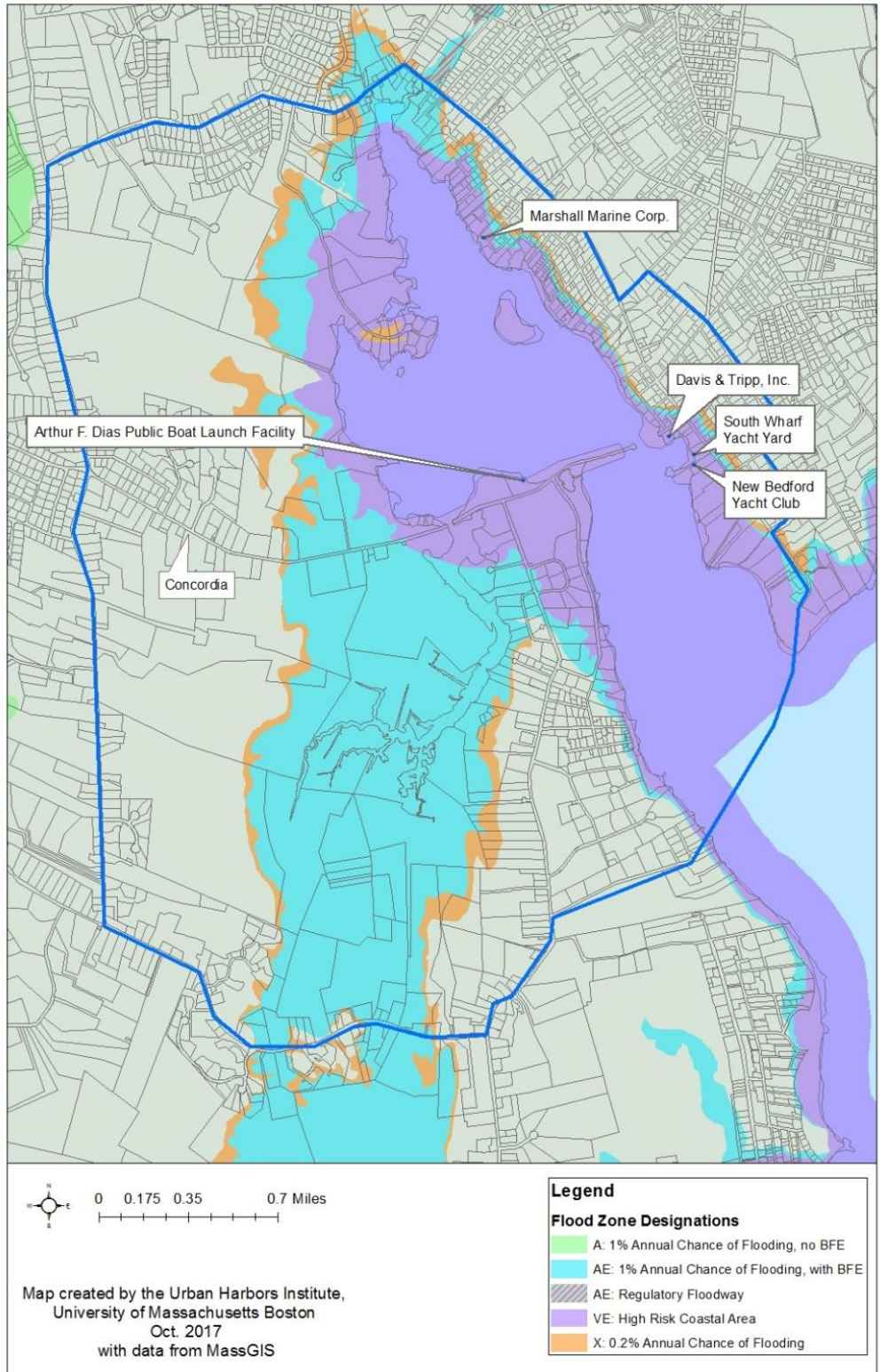


Figure 19: FEMA Flood Zone Designations for Padanaram Harbor.

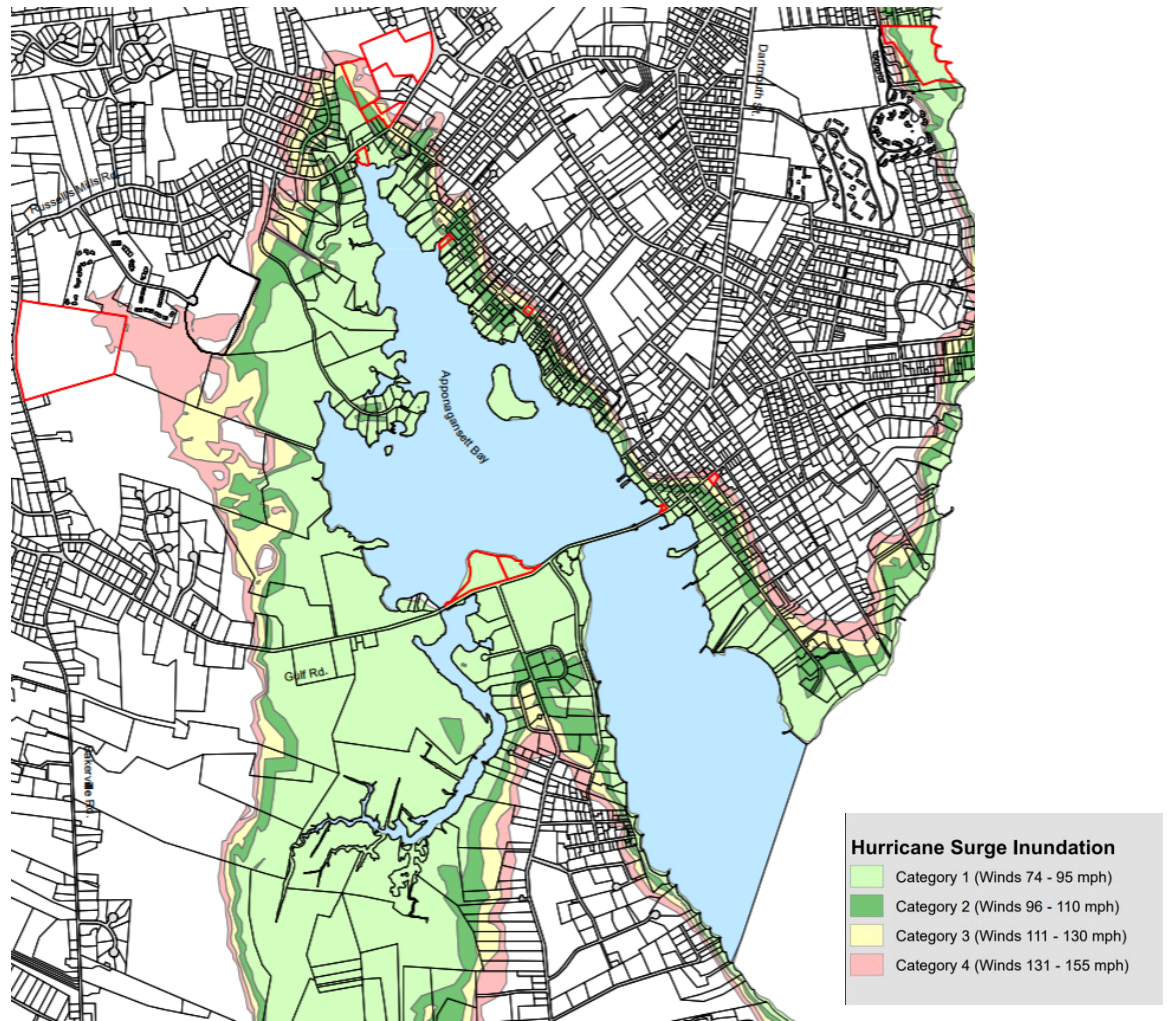


Figure 20: Hurricane surge inundation based on different hurricane categories.¹¹⁹

In addition to those high hazard areas identified in the Multi-Hazard Mitigation Plan, FEMA reports a total of 140 losses, town-wide, under the Federal Flood Insurance Program between 1978 and 2013, and four repetitive losses for residential properties, with “repetitive loss” defined as properties experiencing two or more losses of at least \$1,000 in damage within a ten-year time period since 1978. The repetitive losses took place in 1991, 1992, 1997, 2001, and 2005, and each property experienced two or three losses.¹²⁰

Climate Change Impacts: Storm Surge and Daily Inundation

The FEMA flood zone designations and storm surge maps in Figures 19 and 20 show present-day conditions, and do not take into consideration projected climate change impacts such as sea level rise. In the northeast, sea levels have risen approximately one

¹¹⁹ Comprehensive Environmental, Inc. 2015. Local Multi-Hazard Mitigation Plan, Town of Dartmouth. Online at: https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/final_dartmouthhazardmitigationplan.pdf.

¹²⁰ *Ibid.*

foot since 1990, exceeding the global average of eight inches,¹²¹ and sea level rise predictions for Massachusetts range from 29 cm (.95 ft.) to 201 cm (6.6 ft.) by 2100, depending on which model one uses.¹²²

The Massachusetts Office of Coastal Zone Management and the Buzzards Bay National Estuary Program developed maps showing what floodplains in Padanaram Harbor might look like, given different sea level rise scenarios (see Figure 21).

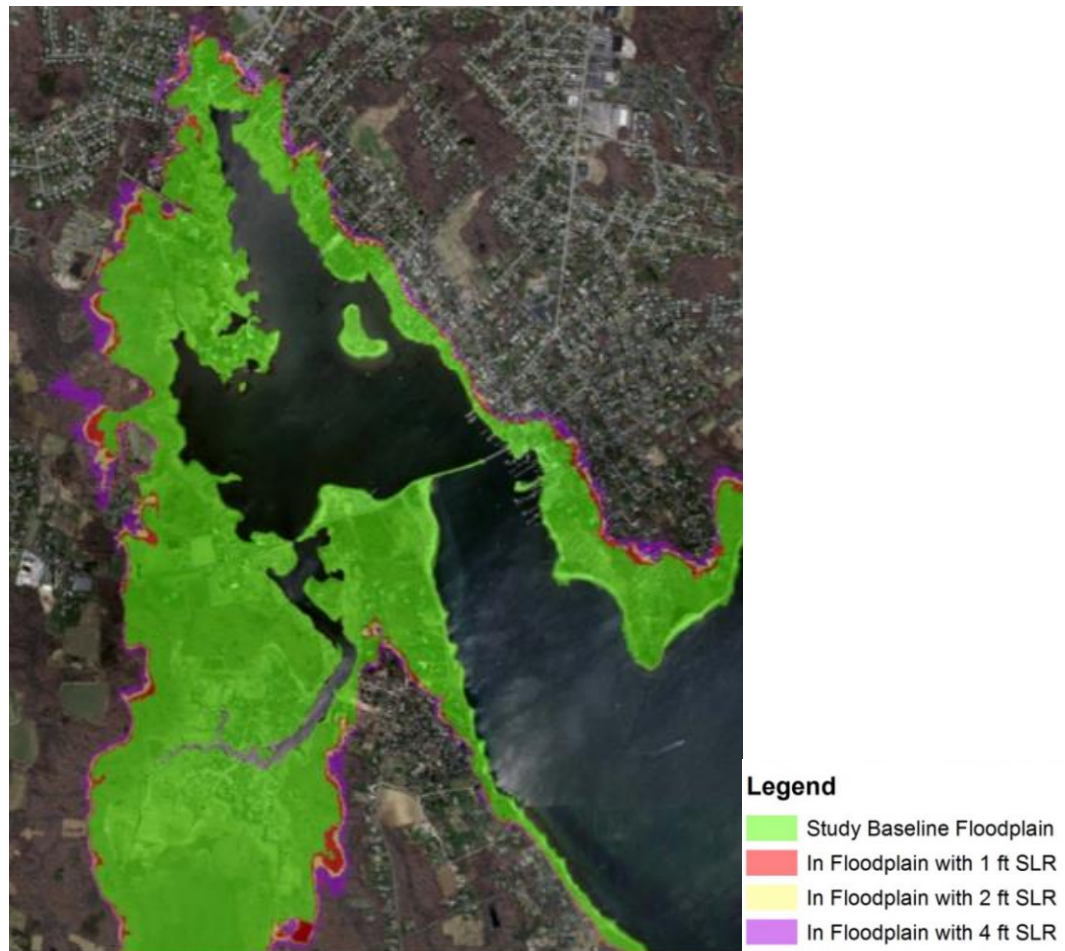


Figure 21: Floodplain Boundaries based on Flood Insurance Rate Maps with various sea-level rise scenarios.¹²³

¹²¹ Horton, R., G. Yohe, W. Easterling, R. Kates, M. Ruth, E. Sussman, A. Whelchel, D. Wolfe, and F. Lipschultz, 2014: Ch. 16: Northeast. *Climate Change Impacts in the United States: The Third National Climate Assessment*, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 16-1-nn.

¹²² *Climate Change in Massachusetts and its Impacts*. Online at: <https://www.mass.gov/service-details/climate-change-in-massachusetts-and-its-impacts>.

¹²³ Costa, J.E, D. Janik, and J. Rockwell. 2013. *Projected Expansion of the Floodplain with Sea Level Rise in Dartmouth, Massachusetts*. Buzzards Bay National Estuary Program and Massachusetts Office of Coastal Zone Management. Technical Report SLR13-2. Draft January 18, 2013. Online at: http://buzzardsbay.org/bbpreports/flood_zone_expansion_with_slr_dartmouth_2-1-2013.pdf.

As sea levels rise and the climate continues to change, storms may be more intense, bringing higher storm surges and wave heights. Locally, depending on storm conditions, flooding may be further enhanced by eddies that form in the southern portion of the Harbor.¹²⁴ With a four-foot rise in sea levels, special flood hazard areas can be expected to encompass new roads and coastal properties, creating challenges for property owners, *e.g.*, damage to one’s property or having to evacuate during storm events. First responders and emergency planners will also have to consider these new areas of potential flooding as they examine evacuation routes, vulnerable infrastructure, and other potential issues.

As part of a 2014 study for New Bedford and neighboring communities, RPS (along with partners SeaPlan and Fuss & O’Neill) conducted storm surge modeling using NOAA’s Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model to produce more than 60,000 storm surge predictions representing various combinations of sea level rise and hurricane parameters. The results were then aggregated into 20 inundation depth grids, each representing worst case inundation for a particular hurricane category and SLR scenario. Figures 22–24 display the results of that modelling.

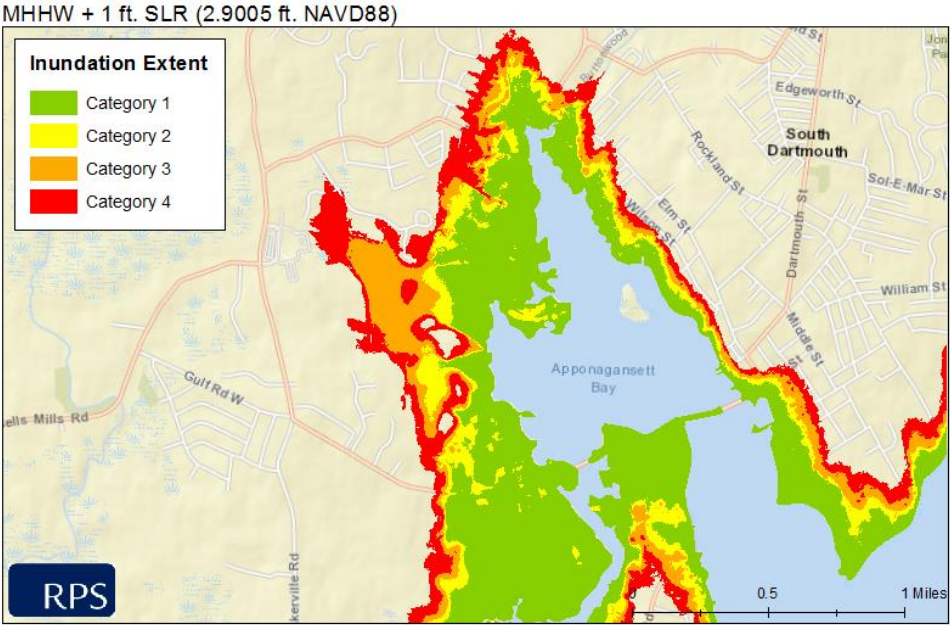


Figure 22: Mean High High Water Under Different Hurricane Conditions, Given One Foot of Sea Level Rise.¹²⁵

¹²⁴ Zhang, Z., Chen, C. Beardsley, R.C., Li, S., Xu, Q. 2018. Climate Vulnerability Assessment on Potential Flooding of Apponagansett Bay and Clarks Cove, Dartmouth Town, MA.

¹²⁵ Longley, K. and Lipsky, A. SeaPlan. Climate Change Vulnerability Assessment and Adaptation Planning Study for Water Quality Infrastructure in New Bedford, Fairhaven and Acushnet, June 2014. Boston (MA): Doc #220.14.01, p.215.

MHHW + 2 ft. SLR (3.9005 ft. NAVD88)

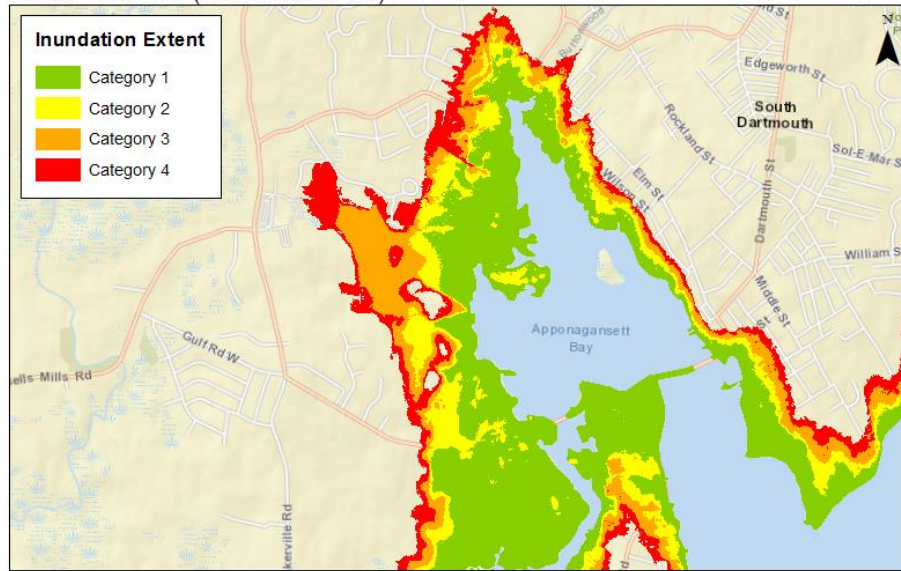


Figure 23: Mean High High Water Under Different Hurricane Conditions, Given Two Feet of Sea Level Rise.¹²⁶

MHHW + 4 ft. SLR (5.9005 ft. NAVD88)

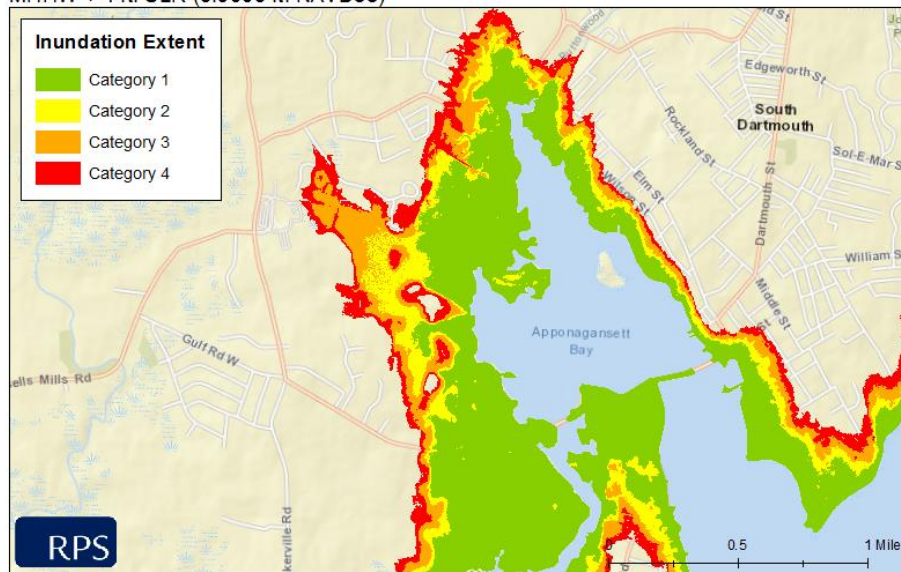


Figure 24: Mean High High Water Under Different Hurricane Conditions, Given Four Feet of Sea Level Rise.¹²⁷

Sea level rise will also impact the coast during the day-to-day tidal cycle. Figure 25 shows changes to mean high water under different sea level rise scenarios, with new areas—most notably in the vicinity of Bay View Marshes, the Star of the Sea, and the New Bedford Yacht Club—anticipated to experience inundation twice daily under a three- to four-foot increase in sea level.

¹²⁶ *Ibid.*

¹²⁷ *Ibid.*

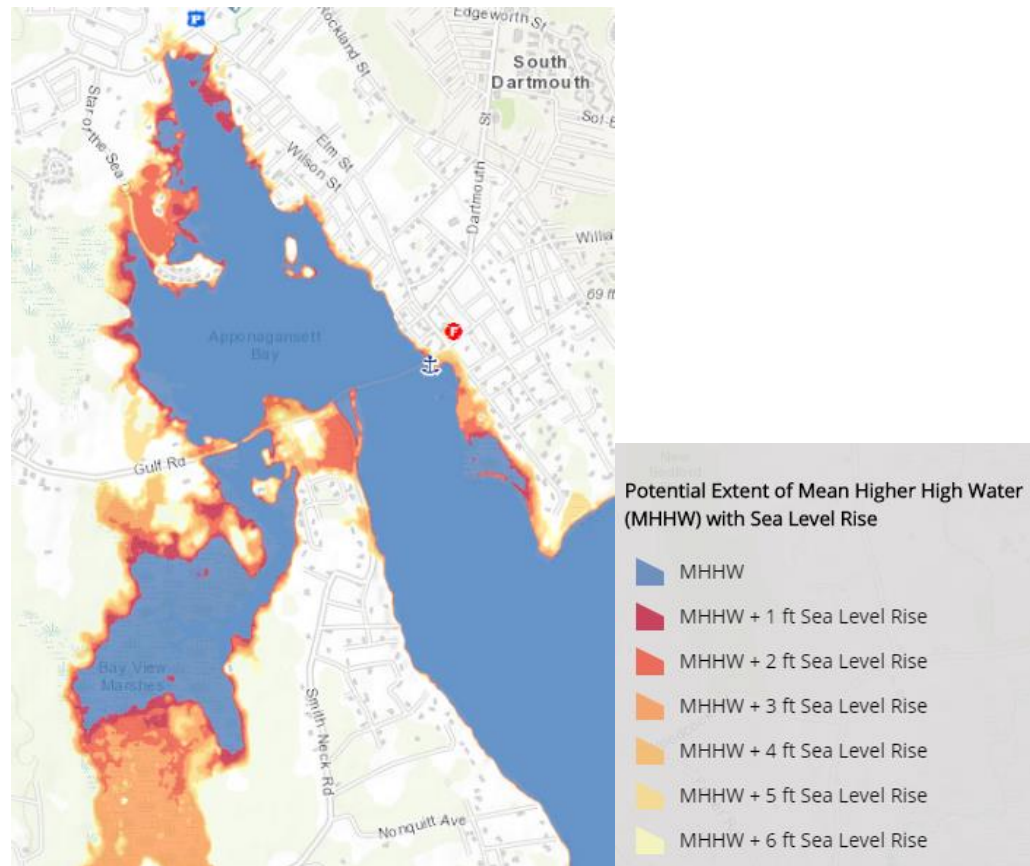


Figure 25: Potential Extent of Mean Higher High Water under Different Sea Level Rise Scenarios.¹²⁸

In addition to flooding caused by sea level rise, storm surge, and wave action, rain events can also cause flooding of roads, properties, and local rivers such as Buttonwood Brook, which periodically floods portions of Hawthorne and Allen streets.¹²⁹ Rain-related flooding, which can be caused by prolonged heavy rains, several consecutive rain events over a short period of time, and/or rapid snow melt, is exacerbated by improperly maintained/inadequate stormwater system components such as clogged pipes and blocked catch basins and undersized culverts, which prevent proper collection of rain water and runoff. Scientists predict a 13% increase in extreme precipitation events by 2100 as a result of climate change.¹³⁰ As the frequency of heavy downpours increases, the Town can expect to see greater flooding from these precipitation events.

¹²⁸ Map from Massachusetts Sea Level Rise and Coastal Flooding Viewer, MA CZM. Online at: <https://mass-eoea.maps.arcgis.com/apps/MapSeries/index.html?appid=6f2797652f8f48eaa09759ea6b2c4a95>.

¹²⁹ Comprehensive Environmental, Inc. 2015. Local Multi-Hazard Mitigation Plan, Town of Dartmouth. Online at: https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/final_dartmouthhazardmitigationplan.pdf.

¹³⁰ Climate Change in Massachusetts and its Impacts. Online at: <https://www.mass.gov/service-details/climate-change-in-massachusetts-and-its-impacts>.

Dartmouth has worked to minimize flooding-related damage through the development of the Floodplain Overlay District and subdivision regulations that address stormwater. More specifically, the Floodplain Overlay District is intended to reduce damage to property, ensure public safety, eliminate costs related to flooding response and cleanup, avoid the loss of utility services, prevent public emergencies from flooding-caused water quality contamination and pollution, and eliminate new hazards to emergency responders.¹³¹ The overlay district accomplishes these goals by taking measures such as requiring all habitable structures to be elevated one foot above base flood elevations and located landward of mean high tide, requiring sewer connections for habitable structures located in VE and V Zones, and reviewing all subdivision proposals to ensure that they minimize flood damage and take other measures to reduce exposure to and exacerbation of flooding.

Furthermore, the Town contracted with the Marine Ecosystem Dynamics Modeling Laboratory at the University of Massachusetts Dartmouth to develop a model to describe the potential impacts of climate change-induced sea level rise on storm inundation in Padanaram Harbor and Clarks Cove. The final product includes a Google Earth interface that the Town can use to understand the impacts of 100-year flood, given up to six feet in sea level rise.¹³²

The Town also developed a multi-hazard mitigation plan in 2015 that identifies natural hazard risks and corresponding existing and proposed mitigation measures.¹³³

In addition to exacerbating flooding, climate change will also impact natural resources. For example, as waters warm, some marine species are seeking cooler water by moving northward or to deeper water. This migration will result in the arrival of new species as well as the decline in current local populations, and may create new competition among species for resources such as habitat and food. Furthermore, rising seas and increased flooding can submerge or otherwise alter coastal resources such as marshes, wetlands, and beaches, impacting important feeding and nesting habitats for wildlife, and impairing ecosystem services such as water filtration and flood control.

¹³¹ Town of Dartmouth Zoning. Section 19—Floodplain District.

¹³² Zhang, Z., Chen, C. Beardsley, R.C., Li, S., Xu, Q. 2018. Climate Vulnerability Assessment on Potential Flooding of Apponagansett Bay and Clarks Cove, Dartmouth Town, MA.

¹³³ Comprehensive Environmental, Inc. 2015. Local Multi-Hazard Mitigation Plan, Town of Dartmouth. Online at: https://www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/final_dartmouthhazardmitigationplan.pdf.

EMERGENCY RESPONSE

There are approximately 930 boats on moorings in the northern and southern segments of Padanaram Harbor. Another estimated 450 vessels are kept within the Harbor at marinas, the New Bedford Yacht Club and private docks. Over the course of the year, a range of emergencies may occur on and around the Harbor, including boats adrift or aground, boat fires or lightning strikes, boats taking on water, health issues, and others. There is also the potential for emergencies on docks and piers, at the beach at Apponagansett Park, or at other shoreside facilities. Rapid and coordinated emergency response can save lives and minimize impacts to people and property.

Four town agencies are the primary responders to emergencies in the Harbor area:

- Harbormaster's Department
- District 1 Fire Department
- Dartmouth Police Department
- Lifeguards at the Apponagansett Park Beach

[Harbormaster Department](#)

The typical initial point of contact for a Harbor emergency is the Harbormaster's Office. The Department has a number of vessels that respond to groundings, boats taking on water, or medical transportation. Additionally, the vessels can provide initial response to fires, although they are not as well equipped as the District 1 Fire Department.

Under Chapter 90B of the Massachusetts General Laws, Harbormasters and Assistant Harbormasters may enforce waterways laws and address violations as described in the statute. The Harbormaster and some members of the Department staff have completed the requisite harbormaster training.

The Harbormaster's Department also coordinates with the Buzzards Bay Marine Task Force, a regional entity that cooperates to supplement local emergency resources.

[District 1 Fire Department](#)

District 1 responds to fire and rescue needs in and around the Harbor, and all of the planning area for the Harbor Plan is within this District's jurisdiction. The District owns and operates a 32-foot fire boat that is in the water generally from May–November. The staff of this Department has the capacity to fight fires from either the land or water as well as assist in dewatering capsized vessels. District 1 coordinates with the Harbormaster's Department in emergency response and also participates in the regional Buzzards Bay Marine Task.

[Dartmouth Police Department](#)

The Police Department responds to reports of violations of law on and around the Harbor. A marine unit with a 25-foot boat is stored on land at the current police facility on Russells Mills Road. From the time a crew is assembled, it is estimated that it would take 20 minutes to launch. Principally, the vessel is used to provide a visible deterrent during the summer season to help minimize violations, although they have the authority to issue citations and/or make arrests for violations. The Police Department conducts safety checks as needed.

Some members participate on the regional dive team for emergency response.

[Apponagansett Park Lifeguards](#)

Lifeguards at Apponagansett Park are trained in lifesaving techniques and initial medical attention for water-related accidents. The Dartmouth Department of Parks and Recreation (DPR) holds annual multiagency rescue drills each summer for the purpose of making sure the necessary DPR staff and cooperating agencies are aware of their roles, and to define each agency's role is during a rescue or medical event at the Park. The DPR has developed Standard Operating Guidelines (SOGs) for different types of rescue events. These SOGs have been shared with other required agencies and are reviewed annually. During the exercises DPR staff members become acquainted with other agency equipment so they can further assist Fire and Emergency Medical Services (EMS). This protocol is used throughout the Town park system and is utilized many times each year.

TRANSPORTATION

Transportation-related topics have been widely discussed, and somewhat controversial, within the Harbor planning area for many years. Vehicular and pedestrian movement around and across the Harbor and limited parking in the Village at popular public access sites have drawn considerable attention. Divergent opinions exist as to whether Padanaram Village should be a quiet, residential area with limited traffic and parking or a destination spot for shopping, business, public access to the waterfront, and tourism.

Padanaram Harbor is somewhat distinctive in that it is bisected by the causeway and bridge. These structures have been associated with a wide range of management concerns over the years, including water quality, location of moorings, impacts on vehicular movement into and out of Padanaram Village, emergency response, recreational fishing, and public access.

There are, however, a range of transportation-related management activities affecting that Harbor that are not associated with the causeway or bridge. These include:

- public access along Smith Neck Road,
- parking in and around the Village,
- movement around the waters of the Harbor itself, and
- road and storm drains leading to the Harbor.

These will be discussed further in various other sections of this document.

Current Conditions and Management System

The Padanaram Bridge and Causeway

Initial construction of the causeway and bridge began in the 1830s as a private enterprise to replace the ferry that was operating at the time. At that point, a toll was charged for passage across the bridge. In the 1870s, the Town of Dartmouth acquired the causeway and bridge and it became part of the public road system. In the early part of the twentieth century the causeway was renovated and the bridge itself was rebuilt. The most recent significant upgrading of the bridge portion was in the 1990s.

During 2017–18, there was a major rebuild of the causeway and repairs were begun on the bridge mechanism itself. The granite support for the bridge turntable and the approach areas require maintenance and the electrical system needs to be upgraded. The Town presently has approximately \$1 million set aside for this work. There are some concerns that the granite support system may have been undermined from scour by tidal waters moving through the bridge area.

Ultimately the bridge mechanism will have to be replaced. Replacement with a bascule designed structure is projected to cost in the \$20 million range, reconstruction with a design similar to the existing structure is projected to be in the \$10–\$15 million range. Funding, however, has been, and will continue to be, a major hurdle. Major repair or replacement of the bridge must compete for funds with other Massachusetts bridge projects—most of which have considerably greater traffic volume. The Dartmouth

Department of Public Works (DPW) will be developing preliminary designs for an improved bridge with the expectation that that funding becomes available.¹³⁴

[Landside Travel for Boat Haulers](#)

Padanaram Harbor hosts a sizable boating community. Annually, almost all of the boats moored in the Harbor are launched from and hauled onto land with a significant number being taken away by truck to off-site storage locations. Hauling may be done at the Dias Landing ramps or from marine facilities on the east side of the Harbor. Recently completed modifications to streets in the Village brought narrower streets, one-way traffic, and wider sidewalks with “bump-outs” at crossings. These all serve to limit the size of trailers and vessels that may safely travel through the Village. The potential for a round-about at the juncture of Dartmouth, Prospect, and Middle Streets might also have impacts on boat transportation. The option is for larger trailers/vessels to travel along Gulf Hill, Bakerville, and Russells Mills Road to head east. This route is already congested with traffic near the high school, particularly when busses are entering and leaving.

The changes in the Village streets may also have some impacts in the case of need for rapid evacuations in the face of storm. See the section on Emergency Response for additional discussion on this topic.

[Travel on the Watersheet of the Harbor](#)

Boaters on moorings in the Harbor face the question of how to get to their vessels. Most utilize dinghies, but dinghy storage around the Harbor can be difficult and/or expensive, to find. The New Bedford Yacht Club operates a launch service to get members to and from their boats, but there is presently no commercial launch service operating in the Harbor.

¹³⁴ Hickox, David, Dartmouth Director of Public Works, Pers. Com. Jan. 2018

HISTORIC AND CULTURAL FEATURES

The area around what is now called Padanaram Harbor has seen human habitation for over 10,000 years.¹³⁵ Some of these early sites were short-term hunting and gathering spots while others were long-term village areas; but many, if not most, of the reasons for this habitation are what the Harbor is used for in the 21st century—hunting and fishing, transportation, and recreation.

When the initial English colonists came to what is now called Dartmouth from the Plymouth Colony in the mid-1600s, the Town was not settled, as many other Massachusetts communities were, with a central common, church, houses clustered together with agricultural areas away from the village center. Land in Dartmouth was divided into large parcels on the waterfront and along rivers for water-powered mills. Consequently, houses were scattered throughout the area.

In the late 1600s and early 1700s, a network of villages evolved, including Padanaram, Apponagansett, and Bakerville within the Harbor planning area. By the late 1700s, the Harbor was a site of considerable industry and commerce with shipbuilding and salt production playing large roles. During the Revolutionary War period the Harbor was utilized by merchants, the U.S. Navy, and privateers, and whaling ships were built along its shore. The whaling industry declined during the War of 1812 and was not revived subsequently in Padanaram but, by the mid-1800s, there was a fleet of 13 ships out of Padanaram employing some 350 men.¹³⁶

Salt production at a commercial scale began in the early colonial period and extended into the early 1900s with as many as seven distinct operations around Padanaram Harbor and Dyke Creek/Salt Creek.

Shipbuilding began in the mid-eighteenth century and has continued until the present. Early vessels included schooners, brigs, and barks for the coastal trade and fishing industries. Later, whaling vessels were a focus and the late 19th century and 20th century saw a change-over to yachts and other recreational sailboats.¹³⁷

By the 1870s, Padanaram Village had become well established with residential, commercial, and industrial development.

The Padanaram causeway and bridge had its origins with a toll ferry crossing. In the late 1820s, a private company formed to construct a permanent structure on the site of a pre-existing sand bar that extended across much of the Harbor. The bridge opened in 1838 with a toll house on the east end. By 1870, the Town of Dartmouth had purchased the causeway and bridge for use as a public road.¹³⁸ Since that time there have been major renovation projects on the causeway (1904 and 2016/17) and the bridge element (1901, ~1920, 2001).

¹³⁵ Public Archaeological Laboratory, 2002, "Archaeological Reconnaissance Survey for Town of Dartmouth."

¹³⁶ Massachusetts Historical Commission, 1981, "Town Reconnaissance Survey Report."

¹³⁷ Glennon, Beverly, 2001. "Dartmouth: The Early History of a Massachusetts Coastal Town."

¹³⁸ Glennon, 2001 Ibid.



Image: Undated photograph of the Padanaram bridge and causeway. Courtesy of the Dartmouth Historical Commission.

Padanaram Village itself retains much of its historic character with many homes and some of the commercial structures having been maintained for their period appearance.

Current Conditions and Management System

Dartmouth Historical Commission

The principal branch of Dartmouth town government associated with historical and cultural issues is the Historical Commission. The Commission is charged with “identification, preservation, and documentation of the town’s historical and archaeological assets and for historic preservation planning...under Chapter 40, Section 8D of the Massachusetts General Laws and Section 4–6 of the town’s General By Laws.”¹³⁹ Within the Harbor planning area, this generally has included development of the Historic Inventory of Dartmouth Homes,¹⁴⁰ commissioning an archaeological survey of the Town,¹⁴¹ and supporting the preparation of an inventory of cemeteries.¹⁴²

¹³⁹ Dartmouth Historical Commission, 2007. “Dartmouth Massachusetts Historical Map: Self-Guided Tour & Maps of Historic Villages Histories and Information.”

¹⁴⁰ Massachusetts Historical Commission. Massachusetts Cultural Resource Information System. Online at: <http://mhc-macris.net/index.htm>

¹⁴¹ Public Archaeological Laboratory, 2002, op. cit.

¹⁴² Lund, Judith Navas, 1997. “Burials and Burial Places in the Town of Dartmouth, Massachusetts” also on <http://mhc-macris.net/index.htm>



Image: Circa 1790 home on Elm Street, Padanaram (W. Howland).

The Commission administers Chapter 209: Historic Preservation of the town by-laws regarding demolition of historic structures.¹⁴³ Additionally, the Commission provides expertise for comments to the Select Board, Community Preservation Committee, and other town boards, commissions, and committees on issues related to historical issues.

Padanaram Village has been designated as a National Register District and consequently the Commission also comments on projects within the district that involve federal or state funding or actions.

[Dartmouth Master Plan](#)

The 2007 Master Plan for the Town of Dartmouth¹⁴⁴ establishes a series of community values to be used as guidance in making decisions about the growth and development of the Town. Many of these relate to the historical and cultural resources within the Harbor planning area. They are listed and discussed here to ensure that the Harbor Plan, wherever possible, will be consistent with the existing Master Plan. Excerpted from the list of Community Values are the following:

“WE value the rural character of our Town. The farmland, coastal interface, forests, wetlands, scenic vistas, and historic coastal and countryside village

¹⁴³ A fact sheet on this bylaw and process may be found on the Historical Commission’s web page www.town.dartmouth.ma.us/historical-commission

¹⁴⁴ Full text of Plan may be found at www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/2007_dartmouth_master_plan.pdf

centers all contribute to this shared appreciation. Progress should not diminish or detract from the features that define the nature of our Town.”

“WE value the small town feel that endures within a community that has gained big town attractions. Attention must be paid to the delicate balance of these two traits, with new development integrated in a manner that doesn’t sacrifice small town connections.”

“WE value our historical roots. Our heritage includes buildings and significant natural features that link us across time and enrich our community. Preservation of our historic built and natural landscape should be pursued.”

As means to protect these (and the other) community values, a number of specific objectives were identified—many of which are still valid for consideration today. The following is a brief summary.

Improve mechanisms to protect historical and cultural resources

Recognizing that most of the historical resources are privately-owned homes or businesses, the Master Plan suggested several incentive programs to protect and maintain the traditional look and feel for the area. These included:

- providing financial incentives for the rehabilitation and/or maintenance of historic structures via the Community Preservation Act funds, tax credits/rebates, grants or low-interest loans,
- acquisition of historic properties via purchase or eminent domain,
- establishment of special permit requirements for changes to structures on the Federal or Massachusetts Historical Register,
- implementation of land use mechanisms such as zoning, transfer of development rights, or use of Historic District limitations,
- development of archaeological resource overlay districts based on the findings of the PAL report of 2002,¹⁴⁵ and
- establishing a demolition delay by-law to provide a window for conservation of historic structures [This was enacted and is presently being implemented by the Historical Commission.]

Build on the historical/heritage/scenic resources of the area for economic benefit

In addition to the natural resources of the area, the 2007 Master Plan suggests building on the cultural heritage of a “quaint, seaside village and countryside” as a draw for tourism and a destination for shops and restaurants. Recommendations included:

- Partner with local and regional heritage tourism groups to increase awareness
- Participate in the Massachusetts Heritage Landscape Inventory Program

This State program is designed to identify and inventory “priority heritage landscapes in participating communities” and to “track local actions to protect heritage landscapes.” While there was limited internal discussion of the town’s

¹⁴⁵ Public Archaeological Laboratory, 2002, op. cit.

participation in this program, to date, no actions have been taken for involvement.

- Conduct feasibility studies for creating a scenic landscape overlay district and/or easements for scenic overlooks

As above, there has been limited discussion of such a program within the Town but no measurable action has been taken. A Scenic Landscape Inventory was undertaken by the State in 1982.¹⁴⁶ The figure below is from the mapping product as it applies to the Harbor planning area.¹⁴⁷ Note that most of the planning area is defined as Distinctive or Noteworthy, but that there are no specific sites identified as notable viewpoints or overlooks.

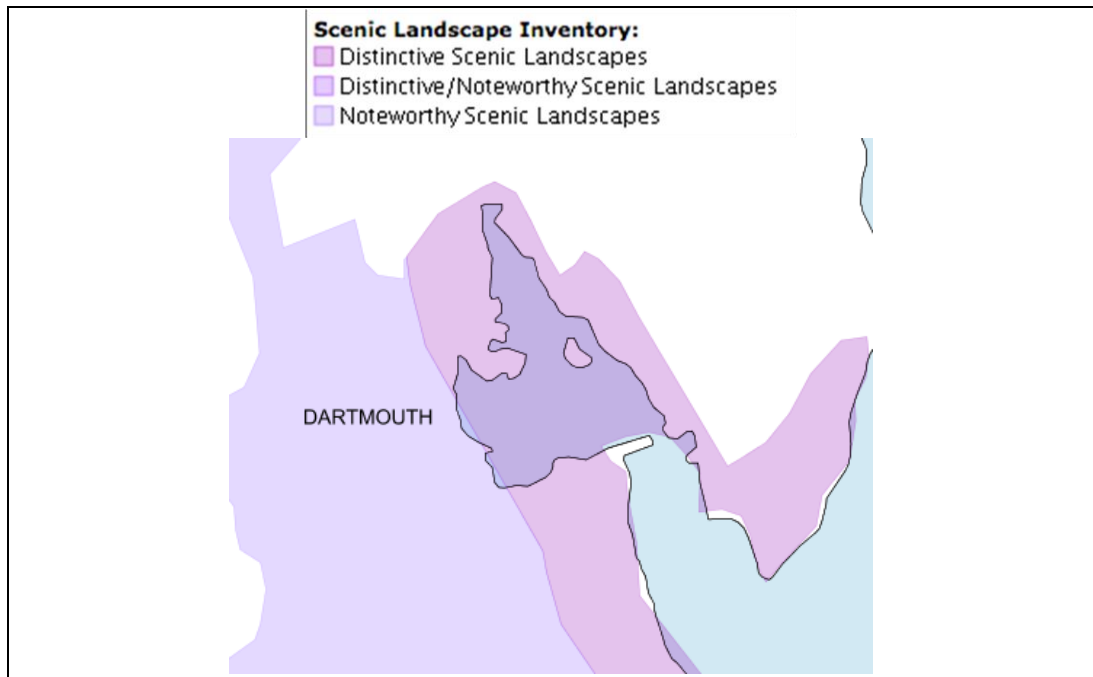


Figure 26: Scenic Landscape Inventory within the Harbor planning area.

- Establish a Scenic Roads program within the Town
Article 87 of the Town of Dartmouth by-laws¹⁴⁸ establishes a Scenic Roads program which includes several roadways within the Harbor planning area including Bakerville Road, Gulf Road, Rock O Dundee Road, and Smith Neck Road. This by-law precludes tree cutting or destruction of stone walls without consent of the Planning Board.

Dartmouth Historical and Arts Society

The Dartmouth Historical and Arts Society (DHAS) formed as a non-governmental organization to “support, promote, preserve, and disseminate the historic and cultural diversity of Dartmouth, Massachusetts. The DHAS collects significant objects and

¹⁴⁶ MassGIS Data: The Scenic Landscape Inventory. Online at: <https://docs.digital.mass.gov/dataset/massgis-data-scenic-landscape-inventory>

¹⁴⁷ MassGIS. Heritage Landscape Atlas. Online at: <http://maps.massgis.state.ma.us/dcr/hli/>

¹⁴⁸ www.town.dartmouth.ma.us/sites/dartmouthma/files/uploads/article87.pdf

artifacts that document the material culture of Dartmouth. It also nurtures and sponsors visual, literary, and performance art in the community.

“The DHAS has leased the 1871 Schoolhouse in Russells Mills Historic District as the DHAS, with programming that includes, but is not limited to the following:

- Conserve, document, and teach the history of Dartmouth
- Preserve and rehabilitate the 1871 Schoolhouse (the former Russells Mills Library)
- Provide living history programs for children and adults about the 1871 Schoolhouse and Russells Mills Village
- Sponsor and promote exhibitions, including those of art and history
- Sponsor and host meetings, programs in the visual and performing arts, and various interest groups in our community.”¹⁴⁹

The Society’s web site contains a wide range of historical documents, maps, books, and other information about the Town and the surrounding area. There is limited material specific to the Harbor but many of the holdings contain references to locations within the Harbor planning area.

Dartmouth Cultural Center

In 2018 the Old Southworth Library, constructed in 1890 in Padanaram Village, was repurposed into the Dartmouth Cultural Center. The historic structure will be the site of a wide range of classes, lectures and workshops designed for public participation. It will be operated by a 501(c)3, non-profit organization to maintain and restore the building and “encourage an appreciation of local artists and artisans.”¹⁵⁰

¹⁴⁹ From the Society’s Mission Statement at <http://www.dartmouthhas.org/about.html>

¹⁵⁰ From the Cultural Center’s Mission statement at <https://heather-stivison.squarespace.com/what-we-do/>

Appendix A:

INTERVIEWS CONDUCTED PRIOR TO FORMAL INITIATION OF THE HARBOR MANAGEMENT PLAN PROCESS.

- John Hansen, Dartmouth Town Planner
- John Sousa, Dartmouth Planning Board
- David Cressman, Dartmouth Town Administrator (2 interviews)
- David Tattlebaum & Douglas Roscoe, Dartmouth Finance Committee
- Steve Melo, Dartmouth Harbormaster
- David Hickox, Dartmouth Director of Public Works
- Mike O'Reilly, Dartmouth Environmental Affairs Coordinator
- Joseph Viera, Chairman, Dartmouth Parks and Recreation Board
- James Viera, Dartmouth Parks and Recreation Board
- Tim Lancaster, Dartmouth Director of Parks and Recreation Department
- Gerry Hickey, Chairman, Dartmouth Waterways Management Commission
- Roger Race, Vice-Chairman, Dartmouth Waterways Management Commission
- Joseph Hannon, Dartmouth Waterways Management Commission
- Andrew Herilihy, Dartmouth Waterways Management Commission
- Geoff Marshall, Dartmouth Waterways Management Commission and Owner of Marshall Marine
- Brad Ellis, Chief, Dartmouth Fire District 1
- Judy Lund, Chair, Dartmouth Historic Commission
- Members of the Dartmouth Historic Commission at a regularly scheduled meeting
- Alan Heureux, Chair, Dartmouth Pathways Committee
- Dexter Mead, Director, Dartmouth Natural Resources Trust
- Owners/operators of marine facilities: Davis & Tripp, South Wharf, New Bedford Yacht Club, Concordia Corporation, Marshall Marine
- Padanaram Business Association
- Steve Caravana, aquaculturist
- Joseph Costa, Director, Buzzards Bay National Estuary Program
- David Janik, Regional Coordinator, Massachusetts Coastal Zone Management Program
- Andrea Langhauser, Wetlands and Waterways Division, Massachusetts Department of Environmental Protection
- Eileen Feeney, Massachusetts Division of Marine Fisheries

Appendix B:

ADVISORY COMMITTEE REVIEW OF TIMELINE AND PRIORITY STATUS FOR EACH RECOMMENDATION

The Advisory Committee reviewed a draft of the recommendations prior to plan approval and ranked the recommendations in terms of priority and timeline. The number of responses in any given cell is the number of Advisory Committee members that indicated that priority status or timeline for the corresponding recommendation. The cells highlighted on the matrix indicate the responses with the highest number of Committee Member selecting that option. This matrix is not a definitive guide to implementing the recommendations, but does provide input on implementation priorities and timelines from those most involved in plan development. In addition, a few recommendations were added to the plan after the Committee’s review had been completed. Those recommendations are included in the matrix below and identified as not having been prioritized by the Advisory Committee.

Goal/Objective/Recommendation	Timeline					Priority		
	Short-term (S)	Medium (M)	Long-term (L)	Ongoing (O)		High (H)	Medium (M)	Low (L)
Topic I: Flooding and Climate Change								
Goal I: Minimize impacts of flooding events								
Objective I: Ensure that measures are in place to address all impacts associated with current flooding scenarios for Padanaram Harbor								
<u>Recommendation 1:</u> The Town should consider participating in the Community Rating System.	5		4			4	3	2
<u>Recommendation 2:</u> The Town should continue to implement the action items in the 2015 Hazard Mitigation Plan.	1	4	5	1		4	4	1
<u>Recommendation 3:</u> Develop a formal plan to remove boats from the harbor in anticipation of a storm.	3	3	3			4	3	2

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 4</u> : Ensure that the stormwater system is capable of meeting current and projected weather conditions.	4	3	2	1		5	4	0
Objective II : Continue to investigate, prepare for, and manage the local impacts of climate change-related flooding due to sea level rise and storm surge								
<u>Recommendation 5</u> : Consider participating in the state’s Municipal Vulnerability Preparedness (MVP) program.	4	3	3			5	3	1
<u>Recommendation 6</u> : Consider public education measures to convey the risks associated with sea level rise and increased storm-related flooding and prepare community members to take actions to minimize the impacts.	1	3	6			3	4	2
<u>Recommendation 7</u> : Review the Floodplain Overlay District and modify it, if needed, to address anticipated flooding.	1	4	4			2	4	3
<u>Recommendation 8</u> : Explore the creation of a regulation prohibiting new construction in high velocity zones.	1	4	4			2	2	5
<u>Recommendation 9</u> : Take measures to address vulnerable infrastructure in the areas anticipated to experience flooding.	2	4	3			6	2	3
<u>Recommendation 10</u> : Review existing evacuation routes annually and make any revisions needed to reflect flooding associated with climate change and related sea level rise.	3	2	4			3	3	4
<u>Recommendation 11</u> : Explore a barrier option for the harbor to protect against storm surges.	3	0	6			1	2	6
<u>Recommendation 12</u> : Evaluate the feasibility of acquiring land to connect West Smith Neck Road to Smith Neck Road to use during evacuations due to flooding conditions.	1	5	4			3	3	3
<u>Recommendation 13</u> : Prioritize protection of lands behind salt marshes to allow marsh migration landward with rising seas.	2	4	3			6	2	1
Objective III : Understand the local impacts of and prepare for climate change-related flooding due to precipitation events								
<u>Recommendation 14</u> : Conduct an analysis of potential inland and precipitation-related flooding as a result of projected changes in precipitation.	0	4	5			2	3	4

Goal/Objective/Recommendation	S	M	L	O		H	M	L
Topic II: Water Quality								
Goal I: To preserve, protect, maintain and, whenever possible, improve the quality of the waters of Padanaram Harbor.								
Objective I: Identify the specific sources and quantities of nutrient inputs into Padanaram Harbor and identify measures to successfully limit these inputs.								
<u>Recommendation 1:</u> Identify, and remediate, the sources of nutrient inputs into the Harbor.	5	3	2	1		9	2	0
<u>Recommendation 2:</u> Determine whether removal or minimization of nutrient inputs from Buttonwood and/or Apponagansett Bay Brooks will be sufficient to meet the thresholds established by the Advisory Committee.	5	4	1			8	3	0
<u>Recommendation 3:</u> Identify and quantify other sources of nutrients to the Harbor that can be managed at the local or regional level. Disseminate the results to resource managers and the public-at-large.	5	2	3			5	4	1
<u>Recommendation 4:</u> Work with the Massachusetts Department of Environmental Protection to complete the Total Maximum Daily Load report for Padanaram Harbor.	2	4	4			4	4	2
Objective II: Identify the specific sources and quantities of inputs of pathogens into Padanaram Harbor and identify measures to successfully limit these inputs.								
<u>Recommendation 5:</u> Establish and implement a monitoring program to clearly identify specific sources and quantities of pathogens reaching the waters of the Harbor. Disseminate the results of this monitoring program to resource managers and the public-at-large.	5	4	1	1		7	2	1
<u>Recommendation 6:</u> Clearly identify those locations within the Harbor where there is the potential for impacts to humans from shellfish consumption or water contact activities and provide focused monitoring there.	5	4	1			7	3	0
Objective III: Identify and implement means to reduce resuspension of bottom sediments that reduce water clarity.								
<u>Recommendation 7:</u> Identify activities that serve to suspend sediments that may reduce water clarity and investigate options for resolution of issues defined during this process.	2	5	4			1	5	4

Goal/Objective/Recommendation	S	M	L	O		H	M	L
Objective IV: Identify and quantify any obstacles to flushing of waters from Padanaram Harbor and, if some are found to exist, work to minimize or remove their impacts.								
<u>Recommendation 8:</u> Accurately evaluate the impacts, if any, on flushing of the northern portion of the Harbor by the causeway/bridge complex.	2	5	4			2	4	3
Objective V: Identify and implement management options to improve water quality in Padanaram Harbor and its tributaries.								
<u>Recommendation 9:</u> Once specific sources for nutrients and pathogens to the Harbor have been identified and quantified (insofar as possible), develop and implement management options to improve water quality in the Harbor and its tributaries.	3	3	4			7	3	0
<u>Recommendation 10:</u> Establish monitoring programs to ensure that the management options being implemented are working to meet the thresholds established for water quality goals. [[Recommendation added after prioritization was complete]]								
<u>Recommendation 11:</u> Establish a Water Quality Committee or Commission within the Town administrative structure to monitor and coordinate activities related to improvement in water quality within the Harbor.	3	4	3			3	6	1
Objective VI: Establish programs to monitor the impacts of management options to improve water quality in Padanaram Harbor and its tributaries to ensure effectiveness of such management options.								
<u>Recommendation 11:</u> Establish monitoring programs to ensure that the management options being implemented are working to meet the thresholds established for water quality goals.	3	2	5			4	6	0
Topic III: Land Use								
Goal I: Ensure that future development balances the needs of a growing population as well as the need to preserve open space and natural resources.								
Objective I: Promote the positive aspects of protection of open space through public education and collaborative efforts among key organizations on property acquisitions.								
<u>Recommendation 1:</u> Continue to educate the public about the importance of open space and natural resource preservation through promotion of protected land, particularly those parcels available to the public for recreational purposes.	3	3	5			3	4	2

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 2</u> : Continue to collaborate with key organizations, including the Dartmouth Natural Resources Trust, to identify, fundraise, and acquire strategic conservation properties.	2	2	6			5	4	0
<u>Recommendation 3</u> : Continue to implement the recommendations contained within the most recent versions of the Town Open Space and Recreation Plan and the Dartmouth Master Plan. [[Recommendation added after prioritization was complete]]								
<u>Recommendation 4</u> : Support the acquisition of the Webb property on Bakerville Road for preservation purposes. [[Recommendation added after prioritization was complete]]								
<u>Recommendation 5</u> : Support acquisition and/or land use restrictions on major parcels within the watershed of the Harbor, especially those in close proximity to the harbor’s shoreline. [[Recommendation added after prioritization was complete]]								
Objective II : Ensure zoning bylaws are enforced and zoning districts, including uses on the Harbor watershed, are adequate to meet current needs and to support future expansion of marine-related businesses, while maintaining natural resources and water quality.								
<u>Recommendation 6</u> : In consultation with marine-related business owners and harbor users, analyze the adequacy of current zoning districts with regard to business expansion and uses on the water.	1	4	4			1	7	1
<u>Recommendation 7</u> : Continue to enforce existing zoning bylaws requiring the use of semi-permeable pavement on all lot coverage exceeding the 70% lot coverage allowed in Village Districts (Section 10.405 Dartmouth’s Zoning By-law) and restricting lot coverage to 50% in the General Residence District (Section 5.407 of Dartmouth’s Zoning By-law).	4	1	4			5	3	1
Objective III : Plan for future land use impacts and development, including from state initiatives, such as the South Coast Rail Project and regulation of short-term rental properties.								
<u>Recommendation 8</u> : Conduct a land use analysis of projected impacts, including increased population and housing pressure, in the Padanaram Harbor watershed as a result of the South Coast Rail Project, regulation of short-term rental properties, and other state initiatives.	0	3	6			1	1	7
Objective IV : Assess potential build-out in the Harbor Plan study area and watershed to evaluate impacts on the Harbor.								

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 9</u> : Use data from the existing Town-wide build-out study conducted in 2016 to create customized maps and analysis for the Harbor Plan study area and update the build-out on a regular basis in response to development or protection of open space.	1	6	2			2	4	3
Topic IV: Public Access								
Goal I: Maximize public access to the resources of Padanaram Harbor in a sustainable manner without adversely affecting private properties or interests.								
Objective I: Develop and disseminate an inventory of public access points or sites.								
<u>Recommendation 1</u> : Develop a descriptive inventory of existing public access points, ways, or sites.	6	3	1			3	6	1
<u>Recommendation 2</u> : Make the results of the descriptive inventory available to Town officials and the public-at-large via the Town web site, brochures, or other outreach mechanisms and materials.	4	3	3			5	3	2
Objective II: Develop and utilize, wherever possible, uniform signage indicating public access points and sites as well as any limitations as to hours, activities, etc. Signage may also be utilized to define the geographical limits of the access way to avoid conflicts with private property or interests.								
<u>Recommendation 3</u> : Design and utilize uniform signage for public access points.	2	6	2			3	5	2
Objective III: Establish defined walkways along the Harbor's edge based on the benefits accorded through the Massachusetts Public Waterfront Act (Chapter 91).								
<u>Recommendation 4</u> : Construct a sidewalk along the water side of Smith Neck Road extending the existing sidewalk at the causeway to the curves at the entrance to Bayview.	1	2	5			2	5	1
<u>Recommendation 5</u> : Develop a plan for a public accessway along the Padanaram Village waterfront south from the causeway to the New Bedford Yacht Club utilizing both existing sidewalks and access granted through Public Waterfront Act (Chapter 91) licenses.	1	5	4			3	4	3
<u>Recommendation 6</u> : Identify and provide signage for other significant public access areas adjacent to the Harbor established through the provisions of Chapter 91.	4	5	1			3	4	3

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 7</u> : Wherever feasible, incorporate options to provide access to people with disabilities into planning and construction near the Harbor. This should be mandatory for town-funded projects. Additionally, where appropriate, requests for such accessibility should be part of the Planning Board’s comments on Chapter 91 licensing applications. [[Recommendation added after prioritization was complete]]								
Goal II: Improve parking options within Padanaram Village and areas surrounding the Harbor								
Objective I: Identify existing and potential parking locations in the Village and around the Harbor and quantify the need for any additional parking.								
<u>Recommendation 8</u> : The Town of Dartmouth should clarify its vision for the current nature and the future of Padanaram Village.	4	3	2			5	2	2
<u>Recommendation 9</u> : Inventory the existing parking spaces within the Village, both public and private.	5	4	1			5	4	1
<u>Recommendation 10</u> : Identify potential additional parking options.	3	6	1			5	4	1
<u>Recommendation 11</u> : Implement the selected parking options.	1	7	2			6	3	1
Goal III: Protect the scenic vistas of the Harbor and in its surrounding area								
Objective I: Inventory significant scenic vistas and identify means for their protection.								
<u>Recommendation 12</u> : Identify significant scenic vistas within the Padanaram Harbor Study Area.	5	4	1			2	6	2
<u>Recommendation 13</u> : Develop techniques for protection of the identified scenic locations and vistas.	1	8	1			2	6	2
Objective II: Minimize “walling off” of views of the Harbor through construction of housing or commercial structures.								
<u>Recommendation 14</u> : Identify mechanisms to minimize blockage of views of the Harbor from public area.	4	5	1			3	4	3
Topic V: Dredging and Navigation								
Goal I: Maintain waterways in Padanaram Harbor in a safe and navigable state for all users.								
Objective I: Promote safe navigation in Padanaram Harbor								
<u>Recommendation 1</u> : Establish a dredging maintenance program for Padanaram Harbor.	3	4	3			4	5	1

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 2</u> : Seek funding to support the dredging program.	1	6	3			4	5	1
Objective II : Determine the cause of sedimentation and shallow waters in areas of Padanaram Harbor where possible, and rectify where feasible.								
<u>Recommendation 3</u> : Conduct studies to determine the cause of sedimentation and shallow waters in the Harbor, and how to rectify shallow areas.	1	8	1			3	7	0
Topic VI: Commercial Uses								
Goal I : Encourage commercial uses in the Harbor while minimizing their impacts on non-commercial uses and natural resources								
Objective I : Ensure that commercial uses of the Harbor are sufficient to meet local needs								
<u>Recommendation 1</u> : Conduct an economic analysis to quantify the financial values of the Harbor to the Town.	2	7	2			2	5	3
<u>Recommendation 2</u> : Develop an inventory of (1) harbor-related services (e.g., moorings, haul-outs, repair facilities), and (2) potential sites for water-dependent uses. As part of this inventory, identify seasonal needs and opportunities for expanding the town’s water-dependent uses and the Marine Industrial zone.	3	5	2			3	4	3
<u>Recommendation 3</u> : Explore options to increase pump-out operations in the fall to meet the demand created by end-of-season boat hauling activity.	4	4	2			6	2	2
Objective II : Promote public uses and/or services associated with commercial operations along the waterfront in a way that is compatible with business operations and safety concerns								
<u>Recommendation 4</u> : Explore opportunities to highlight Dartmouth’s working waterfront and maritime history through the hosting of temporary community events along the waterfront such as “Touch-a-boat”, painting and photography classes, and other similar activities. These events should minimize disruption of existing working waterfront activities and ensure safety of participants. Special focus should be given to events that can take place between late fall and early spring, which coincides with the slow season for many of the commercial waterfront users.	1	7	2			1	4	5
Objective III : Reduce environmental impacts associated with commercial uses around the Harbor								
<u>Recommendation 5</u> : Require the use of permeable pavement and lot coverage by enforcing existing zoning by-laws (e.g., sections 10.405 and 5.407 of Dartmouth’s Zoning By-law).	4	2	5			6	0	4

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 6</u> : Develop a program recognizing businesses for their green practices relative to the health of the town’s water resources.	1	4	5			2	6	3
Objective IV : Ensure that existing regulations pertaining to harbor uses minimize conflicts and establish clear guidance.								
<u>Recommendation 7</u> : Review and update existing municipal regulations to ensure that definitions are clear and that commercial and recreational uses of the Harbor are balanced. [[Recommendation added after prioritization was complete]]								
Topic VII: Recreational Uses								
Goal I : Ensure that Harbor conditions, activities, facilities, and services support recreational uses, including boating, kayaking, fishing, paddleboarding, and sightseeing.								
Objective I : Encourage secure facilities and services to meet the needs of recreational users including moorings, launch access points, storage, and dockside amenities.								
<u>Recommendation 1</u> : Determine the feasibility of creating additional boating facilities and secure in-water and landside storage options for watercraft and kayaks. Assist in the creation of such structures, if possible.	2	5	2			5	3	1
<u>Recommendation 2</u> : Enhance current launch access points for kayaks, paddleboards, and other watercraft, and identify additional potential access points including those with parking for small craft use.	4	2	2			4	2	2
<u>Recommendation 3</u> : Increase awareness of existing transient boater moorings in the northern portion of the Harbor.	5	1	2			3	5	0
<u>Recommendation 4</u> : Where feasible, encourage use of the harbor’s shoreline in such a way to promote Harbor uses and activities, particularly in Town-owned areas.	3	5	1			2	4	2
<u>Recommendation 5</u> : Consider means to improve transportation between the shore and boats on moorings or at anchorage within the Harbor (e.g., public launch service).	2	5	1			3	4	1
Objective II : Ensure that watercraft storage facilities in Padanaram Harbor are safe and secure.								
<u>Recommendation 6</u> : Install security cameras to monitor various areas within the harbor, including the launch area and small boat storage at the Arthur Dias Town Landing.	4	4	0			3	4	1

Goal/Objective/Recommendation	S	M	L	O		H	M	L
Goal II: Ensure that information on recreational activities and safety in Padanaram Harbor is readily available.								
Objective I: Define and publicize how and where to safely conduct recreational activities within and around the Harbor to avoid use conflicts.								
<u>Recommendation 7:</u> Define and publicize recreational areas in the harbor, and consider adopting a bylaw that identifies areas for specific uses within the harbor.	3	3	1			1	5	1
<u>Recommendation 8:</u> Develop and disseminate educational and outreach materials for recreational users of Padanaram Harbor.	1	6	1			2	3	3
Objective II: Ensure that existing regulations pertaining to harbor uses minimize conflicts and establish clear guidance.								
<u>Recommendation 9:</u> Review existing regulations to ensure that definitions are clear and that commercial and recreational uses of the Harbor are balanced. [[Recommendation added after prioritization was complete]]								
Topic VIII: Docks and Piers								
Goal I: Ensure that all docks in Padanaram Harbor are appropriately licensed and permitted according to federal, state, and local laws and regulations.								
Objective I: Establish an inventory of existing docks within Padanaram Harbor along with their licenses under Chapter 91 and Orders of Conditions under the Wetlands Protection Acts. (See also Objectives and Recommendations under the Public Access section.)								
<u>Recommendation 1:</u> Review records held by the Massachusetts Department of Environmental Protection, Waterways Division (DEP Waterways) to identify licenses for structures within the Padanaram Harbor Management Plan Study Area and collect copies or meaningful data from each.	6	2	1			4	3	2
<u>Recommendation 2:</u> Enter the data from Chapter 91 licenses and Orders of Conditions from the Conservation Commission, past and future, into the Town of Dartmouth Geographic Information System.	6	2	1			5	4	0
Objective II: Ensure that existing docks within Padanaram Harbor are consistent with licenses and permits issued by the DEP and the Dartmouth Conservation Commission.								

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 3</u> : Compare each structure within the Padanaram Harbor Management Plan Study Area with the Chapter 91 license and Order of Conditions from the Conservation Commission to ensure that 1) each structure has a valid license and Order of Conditions and 2) that it is in compliance with the most recent license and Order of Conditions.	5	4	1			4	6	0
<u>Recommendation 4</u> . Report any unlicensed structures or those out of compliance, as well as and abandoned or derelict structures, to the appropriate authorities for enforcement action.	4	5	1			4	5	1
Goal II: Ensure that construction and use of docks do not adversely affect the natural resources or commercial and recreational uses within Padanaram Harbor.								
Objective I: Maintain or improve the standards for the protection of shellfish from dock construction and use.								
<u>Recommendation 5</u> : Prohibit the construction of new private, residential docks or expansion of existing such docks in areas with significant productive shellfish populations.	3	3	3			6	1	2
<u>Recommendation 6</u> : For areas that fall below the significant productive threshold, require mitigation for loss of shellfish or shellfish habitat by removal of any existing shellfish and/or paying a fee to a Shellfish Propagation Fund.	4	1	4			5	2	2
Objective II: Protect established mooring and anchorage areas from encroachment from private docks.								
<u>Recommendation 7</u> : Define mooring and anchorage areas within the Harbor, fairways leading to and through mooring areas, and critical navigation areas around moorings and anchorages. Prohibit intrusion of docks into such areas when issuing an Order of Conditions through the Conservation Commission.	6	1	2			7	2	0
<u>Recommendation 8</u> : Incorporate the maps produced from implementation of Recommendation 7 above into the Dock and Pier Regulations of the Dartmouth Wetland Protection Regulations as areas where docks and piers are prohibited.	2	5	2			6	3	0
Goal III: Ensure that cumulative impacts of multiple docks within Padanaram Harbor are appropriately managed to protect natural resources, the scenic quality of the area, and public access along the shoreline								
Objective I: Develop standards to evaluate and manage cumulative impacts on the natural resources of the Harbor.								

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 9</u> : Create standards within the Dartmouth Wetlands Protection By-law to protect shellfish, eelgrass beds, and water quality interests from cumulative impacts related to dock construction and usage.	5	3	2			7	2	0
Objective II : Develop standards to evaluate cumulative impacts due to density and scale on visual impacts to protect the scenic quality of the Harbor.								
<u>Recommendation 10</u> : Establish standards for the protected aesthetic interest contained in the Dartmouth Wetlands Protection By-law.	1	5	2			2	5	1
Objective III : Implement cumulative impact standards through the State and local wetlands protection laws and regulations and the Planning Board reviews under the provisions of C. 91 and/or new bylaws.								
<u>Recommendation 11</u> : Modify the existing Dartmouth Wetlands Protection By-law regulations to incorporate standards for the management of cumulative environmental and aesthetic impacts.	1	5	2			2	5	1
<u>Recommendation 12</u> : Explore options for establishing limits on dock construction (size, extent into the water, property line set-backs) through zoning.	4	4	2			5	3	1
Objective IV : Protect safe riparian access and navigation.								
<u>Recommendation 13</u> : Ensure that comments on applications for C.91 licenses made on behalf of the Town by the Planning Board call for protection of pedestrian movement along the intertidal zone and safe navigation by vessels along the shore areas.	4	3	2			4	5	1
Goal IV: Ensure a fair and efficient licensing and permitting process that provides predictability and timely decisions for proposed docks within Padanaram Harbor.								
Objective I : Improve the existing license and permit processing system within the Town for residential docks and piers to make it more predictable and efficient thereby ensuring as timely a decision as possible for applicants for proposed docks, while protecting all of the interests provided by state and local laws and bylaws.								
<u>Recommendations 14</u> : Ensure good communication and coordination between reviews by the Conservation Commission and the Planning Board.	6	2	1			5	4	0

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 15</u> : Prepare outreach materials targeted to prospective applicants for dock licenses and permits that makes clear both the process in application and review, the resources that are to be protected, and the agencies making the reviews.	3	5	1			1	8	0
Goal V: Ensure that the public benefits such as navigation, public access and shellfishing, lost through the occupation of segments of the Harbor by docks and piers are mitigated in an equitable fashion.								
Objective 1: Provide financial benefits to the Town from private individual use of public waterways.								
<u>Recommendation 16</u> : Review the current process for taxing residential docks to more accurately reflect the value they add to a property as well as the impact they have on the public resource. [[Recommendation modified after Committee prioritization was complete]]								
<u>Recommendation 17</u> : Consider applying the current waterways fees to floats attached to piers. [[Recommendation modified after Committee prioritization was complete]]								
<u>Recommendation 18</u> : Work with the Massachusetts Department of Environmental Protection Waterways Division to have displacement fees paid under the provisions of Chapter 91, the Public Waterfront Act, forwarded to the Town to accrue to a Harbor-related fund.	3	4	2			2	6	1
Topic IX: Commercial and Recreational Fishing								
Goal I: Support commercial and recreational fishing activities in Padanaram Harbor.								
Objective I: Promote commercial aquaculture development in a manner that maintains and/or improves conditions in the Harbor relative to existing uses, habitat, and water quality.								
<u>Recommendation 1</u> : Conduct educational programs on the topic of aquaculture to build interest in/support for the local industry.	1	5	3			1	7	1
<u>Recommendation 2</u> : Identify locations in the Harbor that would be appropriate for aquaculture based on habitat, water quality, access, and competing harbor uses. [[Recommendation added after prioritization was complete]]								
Objective II: Ensure that infrastructure (<i>e.g.</i> , mooring space, launch lanes, parking) and resources (<i>e.g.</i> , enforcement staff) are in place to support commercial and recreational fishing activity in the Harbor.								

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 3:</u> Increase staffing to allow for shellfish propagation and depuration, aquaculture support and monitoring, and public outreach, as well as enforcement duties.	3	4	2			4	6	0
<u>Recommendation 4:</u> Enforce existing by-laws relative to fishing from the Padanaram Bridge and causeway.	5	0	2			5	2	0
<u>Recommendation 5:</u> Continue to pursue efforts to develop a fishing pier extending off the causeway.	3	3	4			7	2	1
<u>Recommendation 6:</u> Explore opportunities to develop a commercial fishing dock. [[Recommendation added after prioritization was complete]]								
Objective III: Conduct efforts to improve recreational fishing through stock enhancements and habitat improvements. (See “water quality” section for recommendations pertaining to water quality improvements)								
<u>Recommendation 7:</u> Continue to conduct relays, propagation efforts, and management closures in order to enhance local shellfish stocks, and seek dedicated municipal funds for propagation activities.	2	4	3			5	4	0
<u>Recommendation 8:</u> Reestablish a volunteer shellfish advisory group to advise Shellfish Constables regarding management, conservation, and propagation.	3	3	2			2	2	4
<u>Recommendation 9:</u> Petition the Massachusetts Division of Marine Fisheries to conduct a full sanitation survey in the northern portion of Harbor for purposes of exploring whether or not new sections can be opened for recreational harvesting.	5	1	2			4	4	0
Topic Area X: Living Marine Resources								
Goal I: Ensure the continued health of the ecosystem and natural marine resources of the Harbor.								
Objective I: Balance human use of the harbor with sustainable management and protection of natural resources								
<u>Recommendation 1:</u> Consider management or protection of natural resources in all development and planning efforts.	4	2	2			6	3	0
Objective II: Regularly monitor conditions and resources within the Harbor and surrounding area								
<u>Recommendation 2:</u> Evaluate any potential impacts created by the redevelopment of the causeway.	3	3	3			4	1	4

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 3</u> : Regularly monitor changes in eelgrass within the southern segment of the harbor and, if water quality improves, for evidence of eelgrass in the northern segment.	2	2	5			5	4	1
<u>Recommendation 4</u> : Conduct surveys to assess the abundance and distribution of wildlife, with particular emphasis on wildlife in the Harbor Plan study area.	1	3	4			1	5	2
Objective III : Support public education and information programs about the natural resources in the Harbor								
<u>Recommendation 5</u> : Encourage Mass Audubon in their wildlife research, conservation, and education efforts, including exploring the potential to expand the South Coast Osprey Project.	2	3	3			1	4	3
<u>Recommendation 6</u> : Explore opportunities to incorporate wildlife educational materials and displays at the Dartmouth Maritime Center.	3	3	2			2	6	0
Topic Area XI: Historic and Cultural Resources								
Goal I: Protect the historical and cultural resources of Padanaram Harbor and the surrounding area.								
Objective I : Improve mechanisms to protect historical and cultural resources through regulatory, funding, and incentive-based programs.								
<u>Recommendation 1</u> : Continue to implement the options for protection of historical and cultural resources outlined in the Town of Dartmouth Master Plan of 2007.	1	2	4			1	4	2
Objective II : Improve community understanding of the nature and value of the historical and cultural resources of the area, not only for their important intrinsic values, but also as a context for current and future development decisions.								
<u>Recommendation 2</u> : Prepare outreach materials identifying the significant historical and cultural sites in and around the Harbor and disseminate these to Townspeople and guests to the community	0	3	4			0	5	2
Objective III : Ensure that cultural and historic values are incorporated into land use and, where appropriate, water use planning, management, and regulatory activities.								
<u>Recommendation 3</u> : Continue to implement items identified in the Town of Dartmouth Master Plan of 2007 including the following specific items:	0	3	4			0	4	3

Goal/Objective/Recommendation	S	M	L	O		H	M	L
Topic Area XII: Transportation								
Goal I: Maintain and improve operability of the Padanaram bridge for both vehicular and boating traffic.								
Objective I: Provide necessary repairs to the existing bridge as quickly as possible while minimizing disruption of vehicular and boating traffic.								
<u>Recommendation 1:</u> Make every attempt to minimize traffic, both automotive and boating, while short-term repairs are being made to the base, electrical system and other parts of the swing bridge.	5	0	2			6	1	0
Objective II: Make all necessary preparations for the construction of a new bridge once funding becomes available.								
<u>Recommendation 2:</u> Prepare design specifications and cost estimates for construction of a new bridge to replace the current swing structure.	2	3	2			6	1	0
<u>Recommendation 3:</u> Continue to seek funding for reconstruction of the Padanaram Bridge.	2	3	2			7	0	0
Goal II: In designing and implementing revisions to roadways and other infrastructure in the vicinity of the Harbor, ensure safe and efficient movement of large boat hauling vehicles								
Objective I: Consider the needs of boat hauling operations when designing and upgrading streets and sidewalks in Padanaram Village and on the west side of the Harbor.								
<u>Recommendation 4:</u> Design roadway and sidewalk modifications within Padanaram Village, westerly on Gulf Road, and southerly on Smith Neck Road to allow for transport of boats that have been hauled from the Harbor or are in transit to be launched into the Harbor.	2	2	3			4	3	0
<u>Recommendation 5:</u> When reconstructing or modifying the location of roadways within the Harbor area, make every attempt to include pedestrian sidewalks and bicycle lanes. [[Recommendation added after prioritization was complete]]								
Goal III: Improve water transportation within the Harbor to facilitate movement to and from moored or anchored vessels.								
Objective I: Work to establish water transportation within the Harbor.								
<u>Recommendation 6:</u> Seek to identify a vendor and shoreside facilities—including dockage and parking—to allow for water transportation to and from moored or anchored vessels.	2	4	3			1	5	2

Goal/Objective/Recommendation	S	M	L	O		H	M	L
Topic Area XIII: Emergency Response								
Goal I: Continue effective emergency response to incidences within or surrounding Padanaram Harbor and improve where feasible.								
Objective I: Clearly define individuals and/or departments responsible for oversight and initial response for various types of emergencies in and around the Harbor								
<u>Recommendation 1:</u> Clearly identify the Harbormaster as the initial point of contact and responder for boating related emergencies.	7	0	2			8	1	0
<u>Recommendation 2:</u> Identify an Oil Spill Coordinator for the Town from existing staff.	8	0	1			7	2	0
<u>Recommendation 3:</u> Clarify the roles and authorities between the Dartmouth Police Department, the Harbormaster Department, and the Shellfish Constable(s) in response to illegal activities in and around the Harbor.	7	1	1			7	2	0
Objective II: Maintain trained staff and appropriate equipment to respond to emergencies.								
<u>Recommendation 4:</u> Ensure that staff and equipment are capable of meaningful response to the wide range of potential emergencies through regularly scheduled joint training exercises.	4	4	2			8	1	0
Objective III: Ensure that communication equipment and procedures between the first responders is fully compatible and suitable for the tasks necessary.								
<u>Recommendation 5:</u> Establish a clear protocol for communication between entities responsible for emergency response including definition of lead entity, defined means of communication and contact, and acquiring and maintaining compatible communication equipment to ensure that contacts can be made in a timely manner.	6	2	2			8	1	0
Objective IV: Ensure that staffing of the various departments is suitably trained in communication procedures for effective and timely transmission of information.								
<u>Recommendation 6:</u> Maintain regularly scheduled joint training exercises with the appropriate staff to practice responses to various types of simulated emergencies.	4	3	3			7	2	0
Objective V: Ensure that staff members of the various departments with emergency response roles and capabilities have an understanding of the operation of lead agencies in various types of emergency response. This may involve emergency planning efforts, joint training, and improved understanding of the equipment inventory, location, and status of the various departments.								

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 7</u> : Establish clear protocols for response to various types of emergencies including lead entity, other entities to be notified and/or involved, and mechanisms to ensure communication and coordination.	5	2	3			7	2	0
Objective VI : Incorporate the realities of sea level rise in planning emergency response in the face of significant storm events.								
<u>Recommendation 8</u> : As part of long-term emergency planning, incorporate projections of sea level rise as an element of hauling and removing vessels from the harbor in the face of storm events.	1	2	5			4	2	2
Topic Area XIV: Cooperation/Coordination among Existing Management Entities								
Goal I: Maximize cooperation/coordination/communication among and between managing entities when making decisions regarding management of Padanaram Harbor								
Objective I : Establish an entity within town government charged with fostering and facilitating coordination/cooperation/communication.								
<u>Recommendation 1</u> : Formally designate a Commission or Department within town government charged with coordination and communication between parties interested in activities within, surrounding or affecting Padanaram Harbor.	4	2	3			6	2	1
Goal II: Incorporate the Goals of the Padanaram Harbor Management Plan into other town planning efforts in order to maintain consistency of purpose across town activities affecting Padanaram Harbor.								
Objective I : Ensure that town planning efforts such as updates of the Master Plan or the Open Space and Recreation Plan are consistent with and/or incorporate the Goals and Objectives of the Padanaram Harbor Management Plan.								
<u>Recommendation 2</u> : Include the Goals and Objectives of the Final Padanaram Harbor Management Plan as part of updates of all major planning efforts within the Town, including updates to the Master Plan, the Open Space and Recreation Plan and the Community Preservation Committee annual needs assessment.	2	3	4			6	3	0
Goal III: Maximize implementation of the Padanaram Harbor Management Plan.								
Objective I : Ensure that the various elements of the Padanaram Harbor Management Plan are carefully considered as to their priorities and timelines and a mechanism is established to monitor their implementation as appropriate.								

Goal/Objective/Recommendation	S	M	L	O		H	M	L
<u>Recommendation 3:</u> Establish a Harbor Plan Implementation Committee or Commission charged with advocating for implementation (or other resolution) of the various elements of the Padanaram Harbor Management Plan.	4	3	4			6	2	1
<u>Recommendation 4:</u> The Harbor Plan Implementation Committee or Commission should prepare an annual report to the Select Board and the Planning Board on the implementation or other disposition of each of the recommendations in the Final Padanaram Harbor Management Plan. The annual summary report should be considered for inclusion in the Annual Town Report.	3	4	4			3	5	1
<u>Recommendation 5:</u> Encourage, as appropriate, the formation of a non-governmental organization whereby the public-at-large can advocate for issues related to the Harbor and its management. [[Recommendation added after prioritization was complete]]								